Interdisciplinary Portfolio of Compositions: Exploration of Movement and Modes of Collaboration in Screendance, Games and VR Media.

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Declaration of Authorship:

I, Elena Alekseeva, hereby declare that the sixteen compositions, the thesis and the work presented in it are entirely my own. I declare that to the best of my knowledge and belief, they contain no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the University of London or other institution of higher education. Where I have consulted the work of others, this is always clearly stated.

Signed: Elena Alekseeva

Date: 31 August 2022

Abstract

My PhD aims and research questions focus on establishing a personal interdisciplinary compositional framework through movement, collaboration, and media as creative inspiration. I explore how collaboration affects the development and negotiation of compositional voice. When focusing on movement, I consider this in two senses – first, how physical gesture can be responded to by music, and secondly, the overall movement of compositional structure and its musical development. My work with media includes writing music and its technical adaptation to screendance videos, games, and VR. Through the development of my research, I illuminate new creative insights by providing a new understanding of the creative dynamics and possibilities of collaboration, interdisciplinary practices, new ways of relating movement and music, and a better appreciation of challenges presented by particular media. I have expanded screendance into an interactive/VR medium and created novel aesthetics by integrating electronic dance music compositional techniques into the general approach of my work.

The submitted PhD consists of an interdisciplinary portfolio of compositions, written commentaries, and links to audiovisual materials, as well as audio recordings. The practical portfolio includes sixteen compositions. Ten compositions are written for screendance in fixed media: *Loneliness*, *Moving Away* (screendance video documentaries, four episodes), *In Angst*, *I See You*, *Dividuals*, *Collage* and *Stay*. Three are interactive (dynamic) compositions for the desktop video games: *Cube*, *The Tension*, *Thing-in-Itself*. The portfolio also includes three VR pieces: one VR game (*VR Circuit*) and two interactive (dynamic) compositions written for screendance in VR medium (*Plasticity*, *Journey Through EDM Environments*).

The written commentary portrays the practical research in context, outlining the methods and explaining insights, inspirations and how all the above led me to establish my compositional framework. The stylistic choice of my music was influenced by popular music, commercial electronic sound aesthetics, tonal language, and my background in instrumental piano playing.

At the end of my thesis, I reflect on the outcomes of my research. I am also looking towards the significance of new possibilities that were opened by my work: suggesting further ways of designing a compositional framework; using dance movements as creative inspiration; arranging compositional elements by designing media space; building musical development via in-game triggers; and others.

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Interdisciplinary Portfolio of Compositions:

Music for screendance videos:

1	*Loneliness*	3': 55''	video file (MP4), audio file (WAV)	Alexandra Martyn-Potts – dance Elena Alekseeva – camera, music	November 2014
2-5	*Moving Away* video documentaries:				
2	Episode with Hugo Cortes	6': 29''	video file (MP4), audio file (WAV)	Hugo Cortes – dance Omari Carter – camera Elena Alekseeva – music	May 2015
3	Episode with Serena Morgan	7':38''	video file (MP4), audio file (WAV)	Serena Morgan – dance Omari Carter – camera Elena Alekseeva – music	April 2015
4	Episode with Anna Clifford	8': 31''	video file (MP4), audio file (WAV)	Anna Clifford – dance Omari Carter – camera Elena Alekseeva – music	January 2016
5	Episode with Simon Watts	7': 26''	video file (MP4), audio file (WAV)	Simon Watts – dance Omari Carter – camera Elena Alekseeva – music	February 2017
6	*In Angst*	5':10''	video file (MP4), audio file (WAV)	Steff D'Archy – dance Omari Carter – choreography, video editing Amer Irdis – cinematography Elena Alekseeva – music	July 2018
7	*I See You*	3': 11''	video file (MP4), audio file (WAV)	Omari Carter – dance, camera, video editing Anna Clifford – dance James Williams – colourist Elena Alekseeva – music	April 2017

8	*Dividuals*	2’: 26’’	video file (MP4), audio file (WAV)	Omari Carter – choreography, camera, video editing William Henris – camera Veera Väisänen – dance Deborah Cacciapuoti – dance Oliver Kittenge – dance Argyro Vlachaki – dance Elena Alekseeva – music	March 2017
9	*Collage*	2’: 08’’	video file (MP4), audio file (WAV)	Murni Omar and Faillul Adam – dance Elena Alekseeva – music, camera, video editing	June 2018
10	*Stay*	5’: 38’’	video file (MP4), audio file (WAV)	Jared Garfield – dance Kloe Dean – dance Omari Carter – camera, film directing, video editing Kate Shortt – cello recording Elena Alekseeva – music	February 2018

Music for video games:

11	*Cube*	Cue 1: 0’: 43’’ Cue 2: 0’: 43’’	video file (MP4) audio files (WAV)	Audiokinetic.com – game development Elena Alekseeva – music	March 2016
12	*Thing- in-Itself*	Ambience: 0’: 58’’ Prologue: 1’: 24’’ Guitar: 0’: 19’’	video game (desktop), playthrough screen capture video (MP4) audio files (WAV)	Arseniy Klishin – game development Sam Retford – voice over Laura Grey – voice over Nathan Baran – animation Elena Alekseeva – music	January 2017

		Ted 'melancholy': 1’: 16’’ Molly call: 0’: 19’’ Final cue: 0’: 38’’			
13	*The Tension* Level 1-10	Variable, the minimum time of a gameplay experience is 34’:35’’	video game (desktop), game playthrough screen capture video (MP4), audio files (WAV).	Yigit Altug Tatlipinar – game development Dave Soltura – voice over Tommy Isaac – scenario Elena Alekseeva – music	May 2018

Music for the VR game:

14	*VR Circuit*	2’: 59’’	application for Samsung Galaxy 7 mobile phone and the VR headset, game playthrough screen capture video (MP4), audio files (WAV): music, sound effects and voice over.	Software development by ARM Ltd. (Cambridge, UK) Daniele Di Donatto – programming Sylvester Bala – project management Thomas Poulet – programming Bonham Kimbalazani – programming Elena Alekseeva – music	January 2017

Music for screendance games in VR:

15	*Plasticity*	Variable, the minimum time of a gameplay	game playthrough screen capture video (MP4),	Amer Irdis – camera, co-producer Gaia Cicolani – dance Josh Barker – camera, lighting	July 2018

		experience is 6’:00’’	audio files (WAV)	Zdravko Zhelev – camera Vivek Ramesh Warriar – programming Elena Alekseeva – concept design, co-producer, music	
16	*Journey Through EDM Environments*	Variable, the minimum time of a gameplay experience is approximately 14’:00’’	Meta Quest (Oculus Quest 2) application, game playthrough screen capture video (MP4), audio files (WAV)	Corinna Abela – dance Dylan Mayoral Galindo – dance Andrej Kowalski – programming Max Richard Ashton – programming, Meta Quest implementation Elena Alekseeva – concept design, producer, director, filming, video editing, music.	November 2021

Introduction

The pieces in this portfolio were composed between 2014 and 2021. During this period, I have changed as a composer, an artist, and a person. From being a student completing set tasks, I became a professional composer, an authoritative and determined person with a better creative understanding. Through these written commentaries, I am presenting my research journey, artistic exploration, and discoveries, as well as my struggles and successes during the process.

The project originated with my interest in exploring the interdisciplinary practice of composing music for contemporary dance. With a background in classical music, I wanted to approach the research degree as an opportunity to expand my practice to incorporate popular/commercial or electronic musical styles. Due to my interest in popular culture, I decided to explore and develop a musical language in this aesthetic mode whilst retaining a unique voice and becoming adept and experienced in composition, production, and collaboration. I wanted to open new creative horizons and possibilities in interdisciplinary practice, and, as my research progressed, the aims, research questions, and work began to take shape.

Aims and Research Questions:

My research aims to explore a personal compositional framework through movement, collaboration, and media as creative inspiration for interdisciplinary practices. The primary research questions that I am looking at are:

- How does visual and conceptual movement drive/affect the creative process of music for audiovisual composition?

- How do modes of collaboration affect the development and negotiation of my compositional voice?
- How are these approaches to movement and collaboration different across the media of screendance videos, games, and VR?

Through the progression of my research, specifically concerning my portfolio pieces *Plasticity* and *Journey Through EDM Environments*, I am additionally considering the following questions:

- How can interactive music techniques be effectively integrated into screendance, with the aim of providing a 'gamified' artwork/form of screendance?
- What is EDM's (electronic dance music) relationship to screendance, and how might it be integrated in an aesthetically substantial way?

Interdisciplinarity

My practice-based research in music composition dealt with the media of screendance, games and VR. The multimedia nature of these media, as well as the collaborative process, led me towards the exploration of interdisciplinary studies. My initial intentions focused on the musical aspects of compositions and their parameters — engagement with rhythm, harmony, melody, structure, arrangement, and sound timbre; i.e. I wanted to create and produce musical material for the chosen media. However, through practical engagement with my portfolio pieces, creative collaboration, research, and searching to understand the creative context, my non-musician collaborators expanded my compositional focus from purely musical aspects (as in the pieces of my portfolio, such as

Cube, *Collage*, *The Tension*, etc.) to thoroughgoing interdisciplinary processes (*Plasticity* and *Journey Through EDM Environments*).

Jennifer Walshe categorises the interdisciplinary practice as 'The New Discipline' because the compositional concerns expand beyond the parameters of musical composition.

> The New Discipline is a way of working, both in terms of composing and preparing pieces for performance. It isn't a style, though pieces may share similar aesthetic concerns. Composers working in this way draw on dance, theatre, film, video, visual art, installation, literature, stand-up comedy. In the rehearsal room the composer functions as a director or choreographer, perhaps most completely as an auteur. The composer doesn't have aspirations to start a theatre group - they simply need to bring the tools of the director or choreographer to bear on compositional problems, on problems of musical performance. This is the discipline - the rigour of finding, learning, and developing new compositional and performative tools[1].

Marko Ciciliani speaks about the role of a composer in interdisciplinary practices in similar terms as part of what he calls 'Music in the Expanded Field'[2]. He elaborates that a large number of contemporary composers create works in collaboration with people outside of the musical field. With this statement, the author refers to this practice as expanding from the musical boundaries to other media forms such as film, dance, photography, and others. For example, Rebecca Saunders incorporates choreographic installations into her music; Jon Hopkins, in collaboration with the Collective Act in their Dreamachine[3], combines light, spatial sound and music. With this approach, a composition expands from musical to interdisciplinary: combining non-sonic elements with music.

[1] Jennifer Walshe, 'The New Discipline', in *Audio Culture: Reading in Modern Music*, ed. Christopher Cox and Daniel Warner (New York, NY: Bloomsbury Academic, 2017), 342.
[2] Marko Ciciliani, 'Music in the Expanded Field — On Recent Approaches to Interdisciplinary Composition', in *Darmstädter Beiträge zur Neue Musik*, ed. Michael Rebhahn and Thomas Schäfer (Mainz: Schott, 2017), 24.
[3] 'Dreamachine | A New, One-of-a-Kind Immersive Experience', Dreamachine, accessed July 20, 2022, https://dreamachine.world.

On the way to becoming an interdisciplinary composer, the technical understanding of other disciplines allows analysis and observation of the parameters, categories, and issues that other disciplines are working with. This analysis enables interdisciplinary practitioners to fuse musical and non-musical parameters into various building blocks of composition. The holistic understanding of a new discipline allows me to generate musical/interdisciplinary ideas and pre-plan further collaboration, understanding the affordances of other disciplines, the skillset of collaborators and general project management.

Marko Ciciliani also states that 'it is important to note that when composers expand into other disciplines, this usually also changes their understanding of music...'[4] The parameters of my compositional practices expanded in *Plasticity* and *Journey Through EDM Environments* from musical elements (rhythm, harmony, melody, structure, and arrangement) into an interdisciplinary activity by engaging with the parameters that are not normally thought of as musical and were treated as compositional concerns, including choreography, movement of the dance bodies (physicality), games, VR, affordances of the filming, editing tools, design and coding. My journey with screendance and games/VR are both journeys of expanding the compositional field. In screendance, I expand from composing for the set film to directing the choreography. In games, I expanded from writing music for a pre-made game to being a collaborator to designing a VR game myself.

In contemporary popular and commercial entertainment culture, music facilitates a vast majority of audiovisual disciplines, such as film, games, VR, screendance and others. This does not mean that these audiovisual disciplines cannot exist in silence; it is quite the opposite; it demonstrates the importance of musical input for the content engagement of a listener/viewer/player. Spallazzo and Mariani suggest that 'games are powerful and complex

[4] Marko Ciciliani, 'Music in the Expanded Field — On Recent Approaches to Interdisciplinary Composition', in *Darmstädter Beiträge zur Neue Musik*, ed. Michael Rebhahn and Thomas Schäfer (Mainz: Schott, 2017), 27.

forms of entertainment. They are interactive artefacts that require interdisciplinary knowledge and know-how to be carefully and wisely designed'[5].

The reliance on music from these disciplines provides opportunities for interdisciplinary practices. It is a common practice for game developers, filmmakers, and choreographers to work with a composer closely on an interdisciplinary project because of the technical and creative aims of the participants. These collaborative practices are powerful and effective in their realisation; however, it raises the question of authorship. If an interdisciplinary piece is created collaboratively, who is the author?

The idea of auteur theory, the overall authorship of a single person in collective practices, was first recognised by the film industry by French theorists in the 1950s. The politique des auteurs, a French coalition of magazine editors, such as Claude Chabrol, Jean-Luc Godard, Jacques Rivette, Éric Rhomer and François Truffaut, were writing about designation of 'auteur'. The origins of the auteur policy are actually traced from Alexandre Astruc's idea of the camera-pen — the notion that the film director should treat the camera just as the writer does a pen[6].

In 1952, the International Federation of Film Auteurs and its members declared themselves auteurs, referring to the concept of an author as a major force for a creative and collaborative medium. '"Auteur theory" undeniably forestalled the development of the ideas about collaboration or collective authorship...'[7]

[5] Davide Spallazzo and Ilaria Mariani, 'Keeping Coherence Across Thresholds. A Narrative Perspective in Hybrid Games', in *Hybrid Play. Crossing Boundaries Game Design, Players Identities and Play Spaces*, ed. Adriana de Souza e Silva and Ragan Glover-Rijkse (London and New York: Routledge Advances in Game, 2020).
[6] James Morrison, *Auteur Theory and My Son John* (New York: Bloomsbury Academic, 2018), 25.
[7] James Morrison, *Auteur Theory and My Son John* (New York: Bloomsbury Academic, 2018), 21.

Jacques Derrida and Michel Foucault challenged the position of 'an author as a function'[8]. Roland Barthes, in his essay 'The Death of the Author' (1967), suggests that the reader's interpretation of a piece determines the author's intentions rather than the biographical explanation of the author[9]. James Morrison considers 'authorship as a paradigm in film practices, including its collaborative nature and its communication on multiple tracks, audial or visual'[10].

Auteur theory is applicable to screendance because this art form corresponds with choreography, music, sound design, film production and post-production practices, mostly under single guidance by a project's director. In video games and VR, the director is the auteur as well; however, due to the scale of a project, from a small number of collaborators to teams of collaborators, the work produced by collaborators can shape the outcome of the initial directorial idea '... authorship of video games involves the power to create, shape, and influence the content, structure, form and affordances of video game works. It involves the power to alter, to write, and to create'[11].

In my interdisciplinary practices, the contribution of collaborators during the creative process is impactful and undeniable. Even though the individual artist's work is the subject of authorship, which of course should be credited, the auteur/director dominates in this hierarchy, suggests, approves, or rejects the ideas/practices of the collaborators. I aim to be the auteur in my interdisciplinary practices (*Loneliness*, *Dividuals*, *Plasticity* and *Journey*

[8] Antonio Calcagno, 'Foucault and Derrida: The Question of Empowering and Disempowering the Author', *Human Studies* 32, no. 1 (2009): 44.
[9] Roland Barthes, 'The Death of the Author', in *Twentieth-Century Literary Theory*, 2nd. ed. Kenneth M. Newton (London: Palgrave, 1997), 120—123.
[10] James Morrison, *Auteur Theory and My Son John* (New York: Bloomsbury Academic, 2018), 21.
[11] Stephanie C. Jennings, 'Co-Creation and Distributed Authorship of Video Games', in *Examining the Evolution of Gaming and Its Impact on Social, Cultural, and Political Perspectives*, ed. Valentine, Keri Duncan and Jensen, Lucas John (USA: IGI Global, 2016), 123—146.

Through EDM Environments) because I generate concepts, guide, and direct the collaborative process.

In Chapter 1, 'Composer as Choreographer', I will outline how movement inspires me to compose music. I will explore how visual and conceptual movement drives/affects the creative process of music for audiovisual media. It explores movement in different media contexts (screendance, games, and VR) and considers the different ways of composing to respond to the movement of dance on screen. Developing the ideas of auteurship, I propose a way of understanding the 'composer as a choreographer' in screendance practices. I also suggest that there is an aesthetic novelty in synthesising EDM and contemporary dance. I ask what 'dance' music is in a contemporary electronic music context and a modern dance context. And I will suggest a fusion of both in my piece *Journey Through EDM Environments*.

Chapter 2 will discuss different modes of collaboration as creative methods. As an artist and composer, I find it lonely to be on my own while I create. By collaborating with other artists, I advance my creativity, as this stimulates my own practice, brings a fresh/unexpected aspect to it, and expands my compositional field to interdisciplinarity. I also look at how changing collaborators and modes of collaboration develop my compositional voice. I will consider how collaborative communication affects the development/negotiation of this personal voice. I will examine how collaborative practice shapes the outcome of audiovisual composition and how modes of collaboration affect the development of the finished composition and the composer's own compositional voice. I will demonstrate my collaborative approaches of writing music to screendance videos, games, and VR. I will explain how I adapt my music to these media types.

Chapter 3 explains my work with technologies and its functional technicalities. It will consider how interactive music techniques can be effectively integrated into screendance to provide a gamified artwork/form. I will explore the question of 'what is EDM's relationship to

screendance, and how might it be integrated in a substantial way?' I will explain the interdisciplinary process by demonstrating how I expand screendance into interactive/VR media, using original compositional strategies, further advancing my role as director/auteur and game designer. I will provide the developed aesthetic novelty: adaptation of electronic dance music compositional techniques into the general aesthetics of my work (*Plasticity* and *Journey Through EDM Environments*).

In Conclusion, I summarise my insights and outcomes. I also explain how my diverse portfolio of pieces links together and suggest areas for further research and innovations.

Contextualisation

Movement

This research focuses on musical composition for fixed and interactive media, specifically screendance videos, games, and VR. My work explores the ways in which musical composition can correspond to images, dance, and human gestures, real or virtual environments, and how various media and environments can inform, respond to, and interact with musical and sonic materials. I explore the dynamics of these relationships, the nature of and the interplay between elements that are plastic and flexible, versus those that are fixed. An examination of the dialogue between media (fixed and interactive) and music and sound is the focus of my creative practice research.

> A great variety of different kinds of activity use and make reference to movement. To the musician it has one meaning, to the painter it implies something else, whilst to the teacher of dance or physical education it has yet other and distinct connotations. Underlying all these differences is a fundamental unity, for the word "movement" implies that something is happening[12].

In my work, I consider movement as something that unites both fixed and interactive media. In media such as film, or screendance, movement is captured and fixed in time. In screendance, movement informs compositions that function as underscoring, written directly to synchronise with the choreography, now fixed in media. When dancers are responding to music, ideas regarding movement are interpreted from music and sound and translated into human gesture.

[12] Samuel Thornton, *A Movement Perspective of Rudolf Laban* (London: Macdonald & Evans, 1971), I.

Underscoring,[13] as has been extensively documented in film composition, can suggest emotions through the manipulation of a listener's expectations (harmonic/dynamic/tempo)[14] in response to the narrative. Sound effects (SFX), which are created directly to synchronise with fixed media, suggest, emphasise, and punctuate audiovisual dialogue. In the case of screendance, SFX are used to emphasise the physical gestures and actions of a dancer at specific linear points, supporting the dramaturgy of the narrative.

In video game play, movement is an interactive element driven by a player's choices and actions, and the spatiality of the medium has often been emphasised[15]. A sense of movement is also present in dynamic music systems. Karen Collins defines dynamic music as music that 'reacts both to changes in the gameplay environment and/or in response to the player'[16]. The range of movement possibilities inside the game environment informs how the music soundtrack is conceived and constructed. I use similar cinematic underscoring techniques and SFX, though here they are structured in a flexible way to allow for interaction regarding movement. In games, cinematic underscore and SFX need to be responsive to different movement circumstances, and music and sounds must meet players' psychological and emotional needs quickly in relation to narrative[17]. In addition to this, SFX must synchronise directly with players' actions and interactive objects for the player to feel a sense of

[13] Frank Skinner, *Underscore*, (New York: Criterion Music, 1960), 3.
[14] Richard Stevens, and Dave Raybould, 'Designing a Game for Music Integrated Design Approaches for Lucid Music and Interactivity', in *The Oxford Handbook of Interactive Audio*, ed. Kasey Collins, Bill Kapralos, and Holly Tessler (Oxford: Oxford University Press, 2017): 149.
[15] Torben Grodal, 'Video Games and the Pleasures of Control', in *Media Entertainment: The Psychology of its Appeal*, ed. Dolf Zillman and Peter Vorderer (Mahwah, NJ: Lawrence Erlbaum Associates, 2000), 197–213.
[16] Karen Collins, *Game Sound: An Introduction to the History, Theory and Practice of Video Game Music and Sound Design* (Cambridge, MA: MIT Press, 2008), 139.
[17] Richard Stevens, and Dave Raybould, 'Designing a Game for Music Integrated Design Approaches for Lucid Music and Interactivity', in *The Oxford Handbook of Interactive Audio*, ed. Kasey Collins, Bill Kapralos, and Holly Tessler (Oxford: Oxford University Press, 2017): 147—166.

involvement in the game world. Kevin Donnelly describes this phenomenon as the 'Triple Lock of Synchronization'[18] in video games: 1) audio, 2) visual image, 3) interactivity.

Focusing on movement as a point of a creative dialogue between musical ideas and the media allows me to build bridges between composing for fixed and interactive media. It is the element by which music is synchronised with the media form; moments during the movement, such as climatic points (points of synchronisation[19]) or encountering a new narrative structure allow for dialogue to emerge, informing the development of the piece.

In creatively responding to movement, I employ composition techniques that combine hybrid film music-style narrative underscoring, synchronised hit points and structural overlapping of textural sequences. Instrumentation in my compositional language starts from combining traditional acoustic instrumental and electronic/synthetic sounds and audio foley.

In video games, it is common for the movement of the player's avatar in the virtual environment (as they travel along a narrative trajectory) to guide the conception and development of the interactive music sequences, as well as coordinating with the art direction and aesthetic of the game itself. The interactivity of this medium is often determined by locations and events triggered by the player's actions and movements in a specifically designed virtual environment. This interactive soundtrack can function like a cinematic underscore, a variable and open-ended musical composition that can support a narrative experience by creating atmosphere, foreshadowing/foreboding or a heightened sense of action/energy depending on the requirements of the story. Elizabeth Medina-Gray calls game music modular, writing that 'more specifically, modularity provides a fundamental basis for the dynamic music in video games. Real-time soundtracks usually arise from a collection of distinct musical

[18] Kevin Donnelly, 'The Triple Lock of Synchronization', in *The Cambridge Companion to Video Game Music*, ed. Melanie Fritsch and Tim Summers (Cambridge: Cambridge University Press, 2021), 94—109.
[19] Michel Chion, Claudia Gorbman, *Audio-Vision: Sound on Screen*, (New York; Chichester: Columbia University Press, 1994), 58.

modules stored in a game's code […] that become triggered and modified during gameplay'[20]. Vertical re-orchestration[21] (in the looping, building manner of commercial EDM[22] music) creates variations of different intensity and narrative purpose of the composition, and the player's interaction with the game determines the structure of the music. At the same time, the movement is emphasised by the synchronisation of sound effects relating to the objects and actions of the player – for example, the sounds associated with running or jumping, picking up or dropping an object, firing a weapon, opening a door, etc. While in video games, sonic elements are interactive, in fixed media, such moments are linear and spread along with the structure; in both cases, but in different ways, movement and sound inform the shape and trajectory of the piece.

Through my work, I explore the possibilities of the creative framework – that is, the responsive dialogue between movement and music/sound; using EDM styles and structural conventions to explore composing new music for dance and human movement in virtual environments; exploring the use of stems layers in the creation of interactive and fixed musical cues, and other discrete musical elements. My compositional work lays the ground for expanding the possibilities of movement-based musical structures in a collaborative compositional process.

Musical Influences

As a composer who is also a pianist, Scriabin's piano works inspire me with their approach to harmony and melody. His work also resonates with my approach, which uses small, repeated materials. Bowers described Scriabin's music as 'melody is harmony unfurled'

[20] Elizabeth Medina-Gray, 'Modularity in Video Game Music', in *Ludomusicology: Approaches to Video Game Music*, ed. Michiel Kamp, Tim Summers, and Mark Sweeney (Sheffield: Equinox, 2016), 53.
[21] Michael Sweet, *Writing Interactive Music for Video Games* (Upper Saddle River, NJ: Addison-Wesley, 2014).
[22] Mark J. Butler, *Unlocking the Groove; Rhythm, Meter, and Musical Design in Electronic Dance Music* (Bloomington: Indiana University Press, 2010).

and added, 'harmony is furled melody'. 'In this way, he levelled the vertical and horizontal differences between harmony and melody to a single unit of compression…Scriabin's melodies turned motivic, fragmentary parts of the whole of the music's tonality'[23].

My music does not represent his harmonic system, but it follows an approach similar to Scriabin. For example, at the beginning of *I See You*, I composed the individual melodic parts, which acquired a harmonic function. These instrumental parts demonstrate elements of counterpoint, polyphony and fragmented motives. (*Figures 1* and *2*)

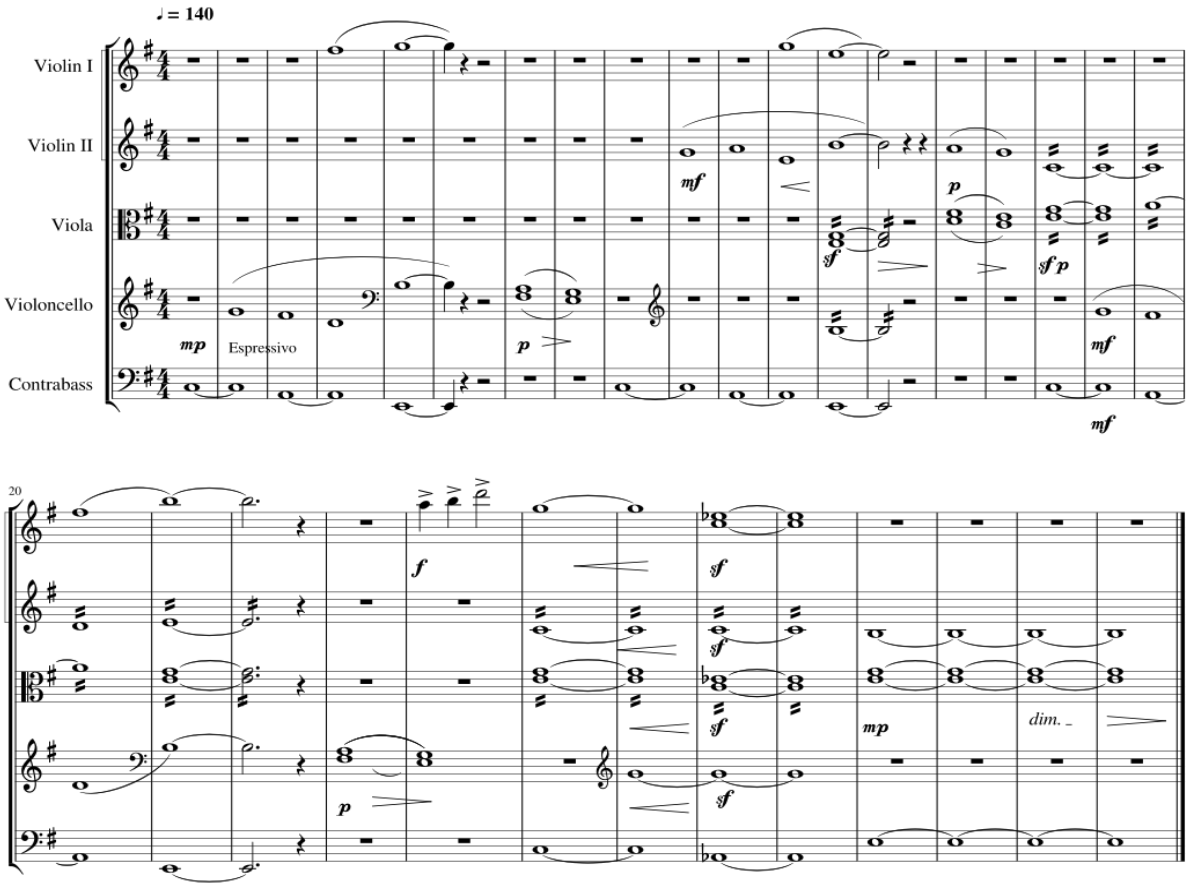

Figure 1. I See You. Introduction. Score view.

[23] Faubion Bowers, *The New Scriabin: Enigma and Answers* (Newton Abbot: David and Charles, 1974), 147.

Figure 2. I See You. Introduction, view in Logic Pro X DAW.

I am inspired by repetition in music minimalism, specifically, by the repetition of similar ideas, melodies, and sounds. (*Figure 3*) I am interested in the ways simple elements can evolve, progress, and mutate/transform through the course of the piece. This compositional approach is used by composers in various musical periods, genres, and styles, particularly by minimalist composers in the late twentieth century, such as Steve Reich and Philip Glass.

To give another example from a different musical style, we can look at the piece *Digerrido*[24] (1992) by electronic music producer Aphex Twin. Here we can also hear repetitions, however, these repetitions are approached differently. The repetitions are mainly in percussive rhythmical elements, monotone 'acid' melody, and other sound textures. In this piece, the harmony and melody are not the focus. Musical development is happening throughout the application of different sound synthesis and plugins on the same repetitive patterns, without changing the patterns themselves. This approach to repetition in EDM has developed due to the nature of music production with sequencers, drum-machines, and DAWs.

[24] YarbTheLegend, 'Aphex Twin — Digeridoo (1080p HD/HQ)', October 18, 2012, accessed August 25, 2022, https://www.youtube.com/watch?v=S5UBYOv1G9A.

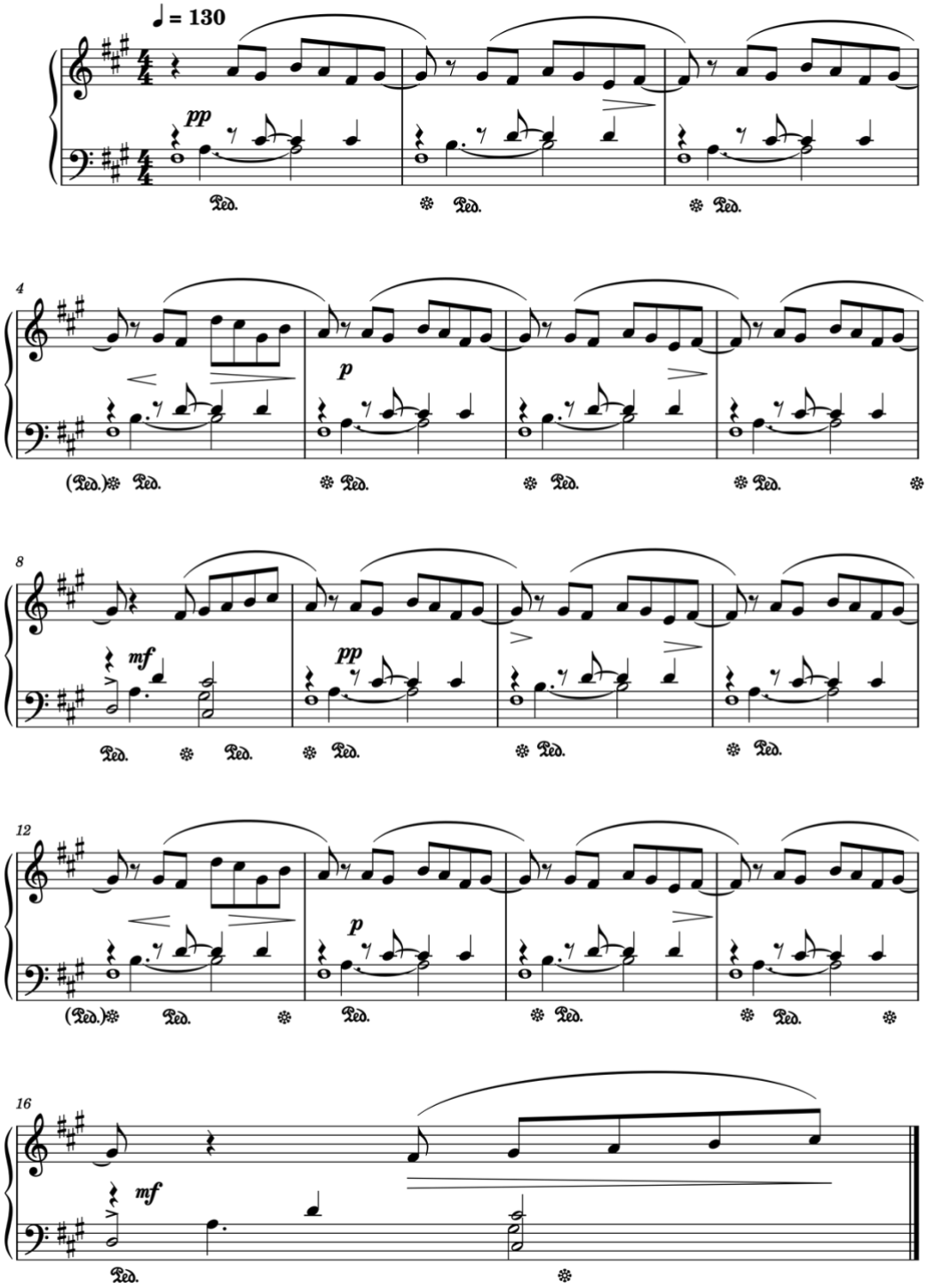

Figure 3. Journey Through EDM Environments. Techno level, the piano instrumental part

In electronic dance music, the rhythmical repetitions of drum patterns and, in most of the pieces, consistent tempo was designed for people to dance to in nightclubs without interruptions. EDM has been defined by Nicholas Collins, Margaret Schedel, and Scott Wilson as featuring

> electronic synthesised and sampled instrumentation, with at least some parts of a percussive nature, in tracks designed for dancing. The length of a composition can be greatly extended, well beyond the typical three-minute pop-song, and the evocation of a beat varies from the linear "four to the floor" to more complex rhythmic patterning, including deliberately loose and ragged grooves. The sound materials extend from purer synthesised and sequenced instrumental tracks (techno is one possible label here) to raw sample-based collages with prominent rapped vocals (hip-hop, rap), also admitting forays into sung vocal hooks of fully-fledged songs…[25]

As I became interested in finding and representing visual movement in music, I started looking for the compositional elements and techniques which make people move, looking at the functions of 'groove' and 'vibe' in these contexts. I also look for deviations from patterns, noticing patterns of the absence of patterns. I then set up musical blocks/or phrases (8, 16, 32 bars), where a change is expected, and play with these expectations.

Rhythm and repetition are intrinsically part of the human physical experience[26], such as heartbeat, breathing and sleeping patterns, etc. We experience these repeating cycles, vibrations, and exchange of energies as fundamental to life, and this allows us to communicate quickly to repetitive 4/4 or 'four-to-the-floor'[27] beat. With automation of sonic textures through DAWs, we dive into its sound world, listening to the music, observing changeable elements in repetitive music. In electronic dance music, repetitive rhythms act as shamans, drawing us to focus on repetitions of sounds: we learn this beat quickly and expect it to continue. However,

[25] Nicholas Collins, Margaret Schedel, and Scott Wilson, *Electronic Music* (Cambridge: Cambridge University Press, 2014).
[26] Steve Goodman, 'Rythmanalysis', in *Sonic Warfare: Sound, Affect, and the Ecology of Fear* (Cambridge, MA: MIT Press, 2012), 85—90.
[27] Rick Snoman, *Dance Music Manual: Tools, Toys, and Techniques*. 3rd ed. (New York: Focal Press, 2014), 44.

if this repetition is taken away, or some unexpected elements are added, people can become surprised, disorientated, or otherwise moved to pay attention to their musical experience.

In traditional score-based composition, the text is the score. The music is notated, and the sonic outcomes can vary, depending on a performer's interpretation. In popular music, the text is most often the recording. Furthermore, in EDM performance traditions, the text is a flexible set of audio and MIDI files, which are combined, constructed, and extended by a producer. These audible elements then need to be triggered into software and/or hardware, which allow the producer to manipulate them and apply various effects. Then the producer plays with the selected elements and creates the music. In EDM, complexity is achieved through combinations of elements and sounds and their flexible purposes. In the context of a nightclub, a DJ mixes these elements live: they are pre-produced and still act as a coherent piece of music, but they are also re-arranged and re-configured — a DJ set for a DJ is interactive.

I find this musical form interesting because of its unique affordances. EDM's sampled and synthesised sound worlds are novel and provide a unique opportunity for expressive creation. EDM music can be broken down into elemental forms, where the structure is laid bare, where the mechanics of repetition and variation are observable, where production choices become expressive and emotional. Collins, Schadel and Wilson write: 'we can trace the core properties of EDM back to the typical sequencer-based construction of the music; basic patterns are auditioned, in looping cyclical time. The piece is built up from combinations of layers are sometimes of different lengths...'[28]

[28] Nicholas Collins, Margaret Schedel, and Scott Wilson, *Electronic Music* (Cambridge: Cambridge University Press, 2013).

Electronic dance music led me to digital music production and practice with software in the studio, which has profoundly affected my compositional approach. Working with DAW (digital audio workstation), such as Logic Pro X, and exploring its functions and limits, afforded me a new way of being creative. This mode of playing around or *'tinkering'*[29], experimenting with software structures to find new combinations of sounds, is another way to approach composing manipulation with sounds inside of DAW and/or recording as a compositional process[30].

The category of production techniques in EDM includes the use of virtual synthesisers, plugins, electronic sounds, sampling and sequencing, side-chain compression, editing techniques, and the design and manipulation of a virtual stereo listening space. The process of varying these techniques and conceptualising ideas brings near-endless possibilities in finding new sounds and combinations of sounds. Even just playing around, improvising with the audio/MIDI material in software might bring unexpected melodic, rhythmic combination, which can affect the musical composition and make it deviate from what was planned. Working with MIDI technology has allowed me to be my own orchestra, work with plugins, simulate the sound of acoustic instruments and control every aspect of texture and time during my compositional process.

Also, working with visual interfaces allows me to see the musical arrangement inside the software on the screen. This helps me to create strong visual engagement with the compositional structure, which becomes an important part of my compositional practice. I was inspired by Burial's album 'Untrue' and specifically by his approach to digital sampling[31]. He

[29] Tim Ingold, *Making: Anthropology, Archaeology, Art and Architecture* (London: Rutledge, 2013).
[30] Allan F. Moore, *Rock: The Primary Text: Developing a Musicology of Rock'.* 2nd ed. (Farnham: Ashgate, 2001).
[31] Resident Advisor, 'Burial's Untrue: The Making of a Masterpiece', Resident Advisor, November 6, 2017, accessed August 27, 2022, https://www.residentadvisor.net/features/3102.

draws 'from-hand' drum patterns in the arrangement window of a DAW (no use of sequencer) creating a swing and feeling of drumbeats. Looking for a perception of pulse in space, he immerses composition in an imaginary atmosphere of ambient sounds, noises, scratch, darkness, city sounds, sounds of the rain or fire and video game sounds. This influenced my instrumental sound choices with the use of ambient and atmospheric textures in combination with beats, as can be seen in my piece *Plasticity*.

Overall, composing for dancers challenged me to explore beat work of EDM and their nuances. Authors such as Michael Hewitt[32] and Rick Snoman[33] have already established the interactive differences in beats from genre to genre, which is communally powerful and culturally significant[34]. EDM affords me the interesting potential to experiment with and develop my compositions on a production level, allowing me to control not only the notes and rhythms but also timbres, articulation, and spatial positioning of those notes, to execute precise edits, cut and paste, be repetitive, minimalistic and, with all these elements, to create an atmosphere, 'groove' that inspires human movement.

To sum up this section on my musical influences, I can say that, on the one hand, my musical approach builds upon my background as a classical musician and, on the other hand, on the discovery of electronic music and digital production. It is the synthesis of these that allows me to operate freely with these techniques in my compositional practice.

Simplicity and Complexity/Linearity and Verticality

A personally situated understanding of *simplicity* and *complexity* and how these ideas relate to my own expressive musical language is important when reflecting on the creative

[32] Michael Hewitt, *Composition for Computer Musicians* (Boston, Mass: Course Technology, 2009).
[33] Rick Snoman, *Dance Music Manual: Tools, Toys, and Techniques*. 3rd ed. (New York: Focal Press, 2014).
[34] Hillegonda C. Rietveld, *This is Our House: House Music, Cultural Spaces and Technologies* (Aldershot: Ashgate, 2003).

philosophies that underpin my creative practice research. I am fascinated by the idea of simplicity, or how to build complex things from very small, simple parts.

My understanding and use of *simplicity* and *complexity* is influenced by an approach to complexity in biology, physics, and interpretations in cultural theory. In such a strand of thought, a complex system will demonstrate behaviours that are not deducible from the behaviour of each individual part. Each part will appear simple compared to the whole system, with a classic example of an ant nest or a flock of flying birds. Complexity arises out of the interaction of 'simple' elements and cannot be understood if only a single element is followed[35]. Such an approach to 'complexity' in biology and physics influenced and was used, in a transformed manner, in art, cultural theory[36], music[37], and other disciplines.

Stuart A. Kauffman argues that the principles of simple and complex systems (both living and non-living) in the world build upon the principles of natural selection and spontaneous order[38]. Ilya Prigogine and Isabelle Stengers, in their book *Order out of Chaos,* state that contemporary humans learned to dissect problems into small parts. However, it is the interaction between these small parts and the environment that is the crucial point. They criticise classical approaches to science, where the 'machine' paradigm is linked to relationships of closed systems. By this, I mean that 'every event was determined by initial conditions'[39], and it has linear dynamics, stability, and order. Prigogine's work offers a different paradigm, which looks at reality as something constantly changing, with instability, disorder, and diversity as its

[35] Stuart A. Kauffman, *The Origins of Order: Self Organization and Selection in Evolution* (New York: Oxford University Press, 1993), 16.
[36] Gilles Deleuze, and Felix Guattari, 'A Thousand Plateaus: Capitalism and Schizophrenia', *Journal of Interdisciplinary History* 19, no. 4 (1989): 657—659.
[37] Christopher Fox, 'New Complexity', *Grove Music Online* (2001), https://doi-org.ezproxy01.rhul.ac.uk/10.1093/gmo/9781561592630.article.51676.
[38] Stuart A. Kauffman, *The Origins of Order: Self Organization and Selection in Evolution* (New York: Oxford University Press, 1993).
[39] Ilya Prigogine and Isabelle Stengers, *Order out of Chaos: Mans New Dialogue with Nature* (London: Verso, 2017), xiii.

core properties. He focuses on non-linear dynamics and temporality as leading to change. The 'open' systems he explored are exchanging energy with their environment, and they keep interacting until they reach a 'critical' point. When this 'critical' point has been reached by 'necessity', the change takes place[40].

In *The Complexity Paradox: The More Answers We Find, The More Questions We Have,* Kenneth L. Mossman suggests that nature has two phenomenological domains: the simple (or linear one) and the complex (non-linear one). The simple domain is described as something that is 'populated by events and processes characterised by linear dynamics and determinism; these linear systems are predictable and obedient to the laws of nature. For example, an apple falls from a tree… A system is defined as linear when the output is proportional to the input; if the system input is doubled, the system output is also doubled'[41].

However, not all living systems are simple and determined: 'The principles of thermodynamics and quantum mechanics establish that some natural systems are indeterminate and express properties of uncertainty, entropy, and irreversibility – features that are incompatible with determinism. Instead, indeterminate systems behave in a nonlinear system… In nonlinear systems, initial conditions dictate system response; thus, without knowledge of initial conditions, system responses become unpredictable, and the future cannot be used to construct the past. …. Nonlinear dynamics are at the heart of complex systems and represent the second domain of nature. Events and processes in the complexity domain are unpredictable and can be highly creative'[42].

[40] Ilya Prigogine and Isabelle Stengers, *Order out of Chaos: Mans New Dialogue with Nature* (London: Verso, 2017).
[41] Kenneth L. Mossman, *The Complexity Paradox: The More Answers We Find, The More Questions We Have* (Oxford; New York: Oxford University Press, 2014), 1.
[42] Kenneth L. Mossman, *The Complexity Paradox: The More Answers We Find, The More Questions We Have* (Oxford; New York: Oxford University Press, 2014), 2.

These approaches to simplicity and complexity have inspired me to think about musical structures in a linear and vertical way; wherein the context of composing music for media, linear structures can be experienced from beginning to end, and complex structures can be changeable. I see the task of designing the experience of fixed media (in my case, it is screendance videos) as a form of linearity: experience unfolding from beginning to end, containing its completeness, trajectory, and determination. To design experience in interactive media (video games and VR), is, for me, to create a 'complex' non-linear musical form, dependent on the variable non-linear gameplay dynamics. From one side, I design structure either in a linear or vertical way, or, in some cases, both (as in *Plasticity*. See Chapter 3 for more detail).

This approach is observable in my compositions, where I tend to express this idea of complexity via creating cellular units of independent instrumental parts (or layers), which are then set to develop into complex structures. Depending on my compositional intention, these melodies can develop in two different ways: firstly, a melody can be perceived as an individual line, which has its own voice, and this voice dominates other instruments, which support it harmonically and rhythmically (*Figure 4*). This melody can be repetitive, while it can also be changeable and mutate into something else. However, other elements of composition might play a harmonic function, supporting the composition like a cushion. These elements are intended to be heard as a supporting background for the melody. Secondly, a melody can be perceived as a cell or repetitive piece of music, which plays a function as part of a groove (pattern-based) and is usually statically playing on a loop (*Figure 5*).

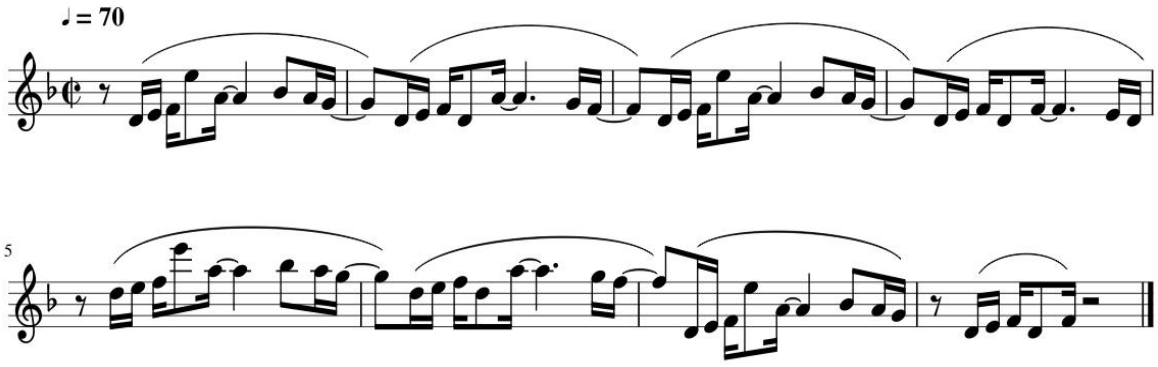

Figure 4. 'Moving Away', episode 1 with Hugo Cortes, piano melody

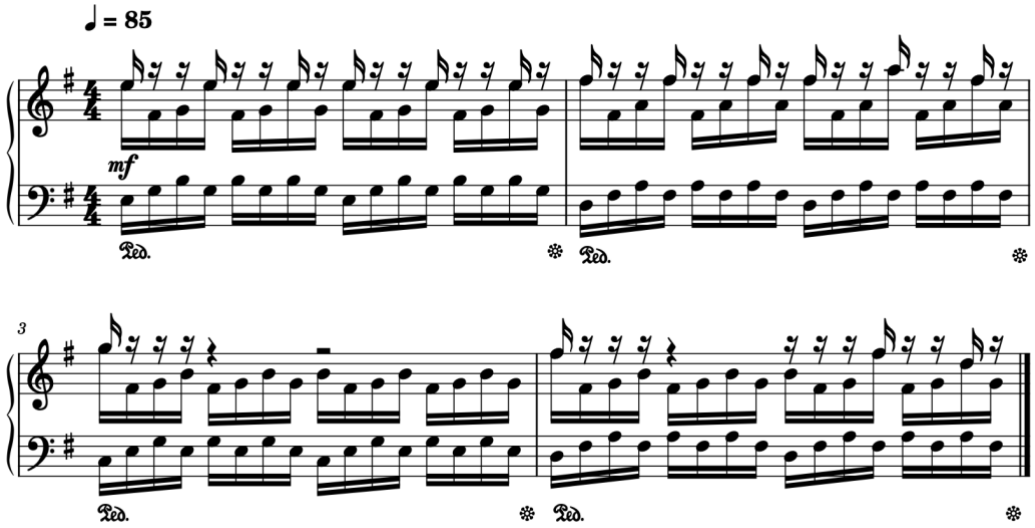

Figure 5. Loneliness. Repetition in the piano instrumental part

To summarise, my musical language includes melodies, rhythm in line with harmonic diatonicism is understood by listeners familiar with cinema, EDM and pop music. Complexity in my music is present in the DAW instrumentation, cellular textural structuring, timbre shaping, and practical implementation of my composed music (audio files) into the media. I design musical soundscapes from small/simple audio – 'particles/loops' and integrate these into the media storyline. The result is an impression of musical development when the viewer/player engages with the media.

Screendance

> A field of activity involving dance and the moving image, which has been referred to as videodance, screen dance, and cinedance... these are predominantly short films and videos made by collaborative director/choreographer teams...[43]

The roots of screendance are in photography of the late 19th, early 20th centuries, when the photographers, such as A. Schlesinger, started to photograph dancers, such as Isadora Duncan (in 1898). The work of Eadweard J. Muybridge, *Woman Dancing (Fancy)* (1887), clearly demonstrates the purpose of this work, which was to visualise dance, to document the choreography, movements, and gestures of the dancers on an image.

Screendance, as a media genre, started to develop in parallel with the boom in the film/cinematographic industry during the 1930s, when Maya Deren, the founder of screendance, experimented with filming herself dancing in front of a camera, exploring cinematic and editorial 'inventions'[44]. When Deren began to experiment with her creative practices, she rarely considered her early works as finished. Due to the context of her creative practices, she was fascinated by the ideas of modernism and avant-garde. She was immersed in the creative process, and that process was more important than the completion of a piece. She liked to cite Paul Valéry's statement that 'a poem is never finished, only abandoned'[45]. To Deren, 'completed' work is a piece that is revised until a point of closure or deadline (films such as *Meshes of the Afternoon* (1943), or *At Land* (1944)). Since its inception, screendance like Deren's work explored the creative possibilities of combination and recombination of materials.

[43] Erin Brannigan, *Dancefilm: Choreography and the Moving Image* (New York: Oxford University Press, 2011), vii.
[44] Greg Faller, 'From Choreocinema to Experimental Screendance: A Personal Archaeology', in *Movies, Moves and Music - The Sonic World of Dance Films*, ed. Mark Evans and Mary Fogarty (Sheffield: Equinox Publishing, 2016), 14.
[45] Sarah Keller, *Maya Deren: Incomplete Control* (New York: Columbia University Press, 2015), 3.

The choreographic practices that used cinematic tools and processes can also be found in early twentieth-century films, such as *Our Dancing Daughters* (1928), an American film that incorporates Charleston-style dance scenes, animated comedy cartoons, such as *The Dance Contest* (1934), where the animated characters are dancing. We can also find dance scenes in films of the Soviet film practitioner and theorist Sergei Eisenstein, for example, *October 1917 (Ten Days that Shook the World)* (1927). Integration of dance on screen in the experimental practices of Merce Cunningham (*Hand-Drawn Spaces*, 1998), post-modern contemporary artists and many others.

As filming technology started to develop editing techniques, the video edit itself was also considered a creative way of expression. The screendance-editing cut is designed for listeners to perceive the screendance film as a final work; because of that, screendance as an art form is not a live performance. As Bruce Posner states on the DVD disc, *Unseen Cinema: Viva la Dance. The Beginnings of Ciné-Dance*: 'the transformation of a stage dance into a unique ciné-dance could only be possible in cinema and never be presented as a live performance'[46].

The video editing tools afford the screendance makers creative capacities with the filmmakers' technologies. It fused movement with the cinematic flow of the screen plot, thus creating an emotional response from the listener using both choreographic and filmic techniques (particularly in themes of intimacy, methods of intensifying climaxes and other approaches).

[46] Greg Faller, 'From Choreocinema to Experimental Screendance: A Personal Archaeology', in *Movies, Moves and Music - The Sonic World of Dance Films*, ed. Mark Evans and Mary Fogarty (Sheffield: Equinox Publishing, 2016), 16.

Screendance can be considered as dance with incorporated film techniques. Noel Carroll, in his "Toward a Definition of Moving-Picture Dance"[47], offers a 'philosophical characterisation' that describes three types of moving-picture dance: the document, the reconstruction (essentially an adaptation of existing choreography) and the construction. He defines construction as a new work brought into being and shaped by editing, camera movement, camera placement, special effects, digital processing, motion capture, computer animation and so on[48]. Bob Lockyer, UK Dance and BBC producer, describes the live performance as linear time and screendance as non-linear, mainly because of its post-production editing[49]. In screendance, the interplay of sonic elements can be categorised into the music (background underscore) and SFX.

The aesthetic experience of screendance is grounded in watching dance movements, as well as the movements of the video cut, and overall, in experiencing the interplay and fusion of these audiovisual dynamics. As Karen Wood writes in her research on 'kinaesthetic empathy', when humans are watching the movements of others, they are physically projecting it on themselves. This is a physical, sensory experience[50]. Karen Collins makes similar arguments regarding kinaesthetic (and kinesonic) synchresis in the context of movement in video games (of which more later).

Screendance is a hybrid art form because it is a synthesis of dance and media practices. In this medium, movement is represented through the body in motion, but also through the video edits, and camera frame. As Douglas Rosenberg writes, 'screendance is not so much in a

[47] Noël Carroll, 'Toward a Definition of Moving-Picture Dance', *Dance Research Journal* 33, no. 1 (2001): 46—61.
[48] Greg Faller, 'From Choreocinema to Experimental Screendance: A Personal Archaeology', in *Movies, Moves and Music - The Sonic World of Dance Films*, ed. Mark Evans and Mary Fogarty (Sheffield: Equinox Publishing, 2016), 21.
[49] Bob Lockyer, 'Recording Dance: A Full and Truthful Record?', *RSA Journal* 137, no. 5399 (October 1989): 703—709.
[50] Karen Wood, 'Kinaesthetic Empathy: Conditions for Viewing', *The Oxford Handbook of Screendance Studies*, Rosenberg, Douglas. Ed. (Oxford University Press, 2016).

creation of dance in the traditional scene but the kind of production laboratory: experiment with choreographic form as well as the formal structure of filmmaking itself, altering camera placement, shot composition, and visual space to find the most efficient and aesthetic methods of framing movement'[51]. During the creative process, it is the arrangement of the form of the final cut that is the focus. Because of this, the dance filming element itself is a process of construction of small parts into something that becomes the screendance video. The focus of the outcome shifts from performance to be documented to the final product after post-production.

Screendance is a media genre which incorporates: a dancer(s), a filming process, dance choreography, a choreography of the video edits and the music/sound. Due to its interdisciplinary nature, the beauty of the screendance creative process is in its collaborative practices. The final product, as a whole, can be the result of an auteur's imagination. However, individual collaborators' input will establish a piece's details. My collaborative screendance practices for the fixed media allowed me to think as an auteur and to build interdisciplinary skills, which were further applied for *Plasticity* and *Journey Through EDM Environments*.

Loneliness - the musical composition was written to silence dance improvisation to explore physical and conceptual movement (please, see more commentaries on the piece in chapter 2). From the artistic point of view, my primary influence on *Loneliness* was my creative practices during my MA studies at the University of Limerick (2012-2014). Being a music student at the Irish World Academy of Music and Dance provided me with interdisciplinary opportunities to engage with the dancers as a composer. Academics of the University of Limerick, such as Jürgen Simpson and Mary Wycherley, formed a screendance community

[51] Douglas Rosenberg, *Screendance: Inscribing the Ephemeral Image* (New York: Oxford University Press, 2012), 6.

and organised one of the most impactful screendance festivals *Light Moves*[52], in 2014. Being surrounded by screendance practitioners, students and academics inspired me to explore this artistic field. My influences on *Loneliness* can be found in silent films and film music, rather than in screendance. Through *Loneliness*, I am exploring my own creative potential as an auteur. A similar approach to *Loneliness* was a sonic choreography of Adam Roberts and Jonathan Burrows's *Blue/Yellow*, performed by the dancer Sylvie Guillem. The approach to choreography is partly similar; the differences arise in the sound choices. In *Loneliness*, the sound choice is focused on diatonicism and silent film music influences; whereas in *Blue/Yellow*, the sound choice can be categorised as a contemporary classical composition for strings; the choreographers also experimented with silence itself in a slightly different way – by allowing the dancer to dance without any sound.

Moving Away - through these screendance video documentaries, as a composer, I explore cinematic music techniques (cues and hit-points in relation to movement). I observe how the dancers are moving; what they say, and I emphasise the narrative with the musical score. Documentaries about dance and screendance is a category on its own within the screendance community. For example, Alysia Fae Klein directed *Cut! A Screendance Documentary*[53]. The documentaries are specific to each film's idea. In my experience, through *Moving Away*, I observed movement, built the compositional techniques, and collaborated with the film director. The research output of these pieces, as well as *In Angst*, *I See You*, *Dividuals*, *Collage*, and *Stay*, is intermediate; however, the learning aspects of collaboration, engagement with various themes/narratives, composing for movement and

[52] Wycherley, Mary and Simpson, Jürgen. 'Light Moves Festival', accessed August 15, 2022, https://lightmoves.ie/.
[53] Alysia Klein, 'Cut! A Screendance Documentary', December 17, 2014, accessed August 25, 2022, https://www.youtube.com/watch?v=cMZ-2_a8MRU.

engaging with the filming elements impacted my interdisciplinary practices for my major works, such as *Plasticity* and *Journey Through EDM Environments*.

Audiovisual Dialogue

In this section, I will present the general outline of the audiovisual dialogue, composing for interactive environments and interactivity (total interactivity and immersion). I will also focus on 'listener/player' experience. At the end of this section, I will be linking this audiovisual context to the media that I have chosen for my research: screendance videos, games, and VR.

In film sound studies, the dialogue between sound and the moving image has been described by Gorbman as 'one of mutual implication'[54], where audio can imply the presence or nature of things not explicitly shown visually. Not all sounds are representational sounds, replicating those we can hear in real life, but might instead denote a learned association that gives the sound design its modality (symbolic signs), or may function in more indexical and iconic ways. Sounds associated with specific objects or movements are called sound effects (SFX). In video games, sound effects – these synchronise directly with player's and characters' actions and interactive objects – are used to communicate meaningful game information: for example, the sounds associated with running or jumping, picking up an object, etc. In screendance, sound effects can be used for synchronicity between the movement of the moving image and the sound.

'The norm in cinema is that the noises people and things make must be synchronised audio visually'[55]. In the moving image, composers and sound designers cannot emphasise every single sound which corresponds to the moving image – SFXs guide the viewer/listener to bring their attention to the specific sounds and to create an action in a visual narrative. Some of the

[54] Claudia Gorbman, *Unheard Melodies: Narrative Film Music* (London: BFI, 1987), 5.
[55] Robert T. Robertson, *Cinema and the Audiovisual Imagination: Music, Image, Sound* (London: Tauris, 2015), 66.

sounds/noise textures, which are important to the plot, can be used in the sonic foreground; the rest of the SFXs can take a role in the background.

Synchronisation of SFX with the visual image is one way of holding together the audiovisual experience and works in tandem with the background non-diegetic 'underscore', as well as spoken dialogue. The emotional dynamics of the plot in underscoring can be seen with tempo, harmonic function, and instrumentation. Audiovisual dialogue is created from these sonic elements in combination and synchronisation with the image.

As synchronisation is central to the audiovisual experience, it is very noticeable when audio or visual becomes out of sync, and asynchronicity can disrupt this experience, or create threatening feelings, as when the sound does not attach to a particular image. However, asynchronicity can be used for other artistic purposes too. For example:

> as almost an opposite of synchronisation, asynchrony refuses the moment of synchronisation. Sergei Eisenstein was one of the first theorists to articulate a notion of film image and sound working though difference and contrast rather than mutual representation. This desire for asynchrony was evident in his theory of film and sound working either in parallel, doing the same thing, or in counterpoint, marking an independence of image and soundtracks[56].

Music and the moving image can interact with each other through a variety of multimodal relationships, which might concord between the music and image, or be purposefully contrasting. Such modes might include the dynamics of the moving image vs musical tempo, visual and rhythmic counterpoint, musical and visual signifiers, affective contrast, temporality of movement and music (stretching time, speeding-up the time), cultural/ideological contrast, perceptual implications, 'mickey-mousing' synchresis, or many other aspects of music-image relationships[57].

[56] Kevin J., Donnelly, *Occult Aesthetics: Synchronization in Sound Film* (New York: Oxford University Press, 2014), 9.
[57] Nicholas Cook, *Analysing Musical Multimedia* (Oxford: Clarendon Press, 1998).

It is the audiovisual fusion, or synchronisation, that is at the heart of the media. The audiovisual artefact is a new, collaborative art form that has special communicative power different to what might be achieved through music or visual elements on their own. It is more than the sum of its parts. The interdisciplinary elements support and complement each other under one artistic concept; they become one inseparable thing.

The main function of music in moving-image media is to transfer the feeling or mood of the narrative or plot, to define the identity of the characters, settings and to emphasise the dramaturgy of the full picture. From this aspect, film music and game music have a similar function to the one defined by Collins in her book *Game Sound*, though here music also engages with the ludic dimension of the media[58].

In media, such as films or screendance, the media is fixed in time. Paul Hoffert writes that 'linear content is well suited to linear media, such as books and television programs that have fixed lengths and are designed to be experienced from beginning to end'[59]. The music can be perceived as one linear audio line, which is composed to fit the image, or the opposite way round, the video edit is created to sync with the audio. In video games, the game engine is interactive, and the player participates in a game directly within the set of options given by the game engine framework. This interactive aspect creates an exciting challenge for video game composers to think differently and apply their music to different circumstances, depending on the player's decision.

An immersive experience in films and games is also different. In films, it is more detached from the listener: you are watching stories of other characters. In video games, the player adopts the subjective tension between his/her 'real' selves and the character who

[58] Karen Collins, *Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design* (Cambridge, MA: MIT Press, 2008), 5.
[59]Paul Hoffert, *Music for New Media: Composing for Videogames, Web Sites, Presentations and Other Interactive Media* (Boston: Berkeley Press Publications, 2007), 5.

experiences the dynamics of the game engine and constructs the reality within limited choices. The game engine and the game music are designed to evoke and stimulate player's emotions (happiness, sadness, fear, etc.) and instincts (survival, protection, etc.) through the gameplay in real-time.

The term 'interactivity' has been described by Collins in her book *Game Sound*[60] as human engagement with the material/content. However, the term 'interactive music' has multiple meanings. From one side, this term can be applied in contemporary classical music, for example in John Cage's piece *Music of Changes* (1951), where performers are randomly engaging with the given material/information[61]. From another side, it can also be applied to generative music, where music interacts with the computer/machine, and it is generated by a system component.

In video games, the user interacts with the console, the game environment and the storyline or narrative. However, this engagement is a reaction rather than interaction. The player engages with the preprogrammed choices. In the games industry, the term 'interactive music' refers to the music which change dynamically based on a player's decision in real-time.

To categorise all hearable sounds in computer games, we can bring them into three groups:

1. Background soundtrack (underscore/cue): this can suggest emotions, create an atmosphere through the manipulation of listener's expectations (harmonic/dynamics/tempo[62]) in response to the narrative.

[60] Karen Collins, *Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design* (Cambridge, MA: MIT Press, 2008), 3.
[61] Elizabeth Medina-Gray, 'Analyzing Modular Smoothness in Video Game Music', *Music Theory Online* 25, no. 3 (2019), accessed 27 August 2022, www.mtosmt.org/issues/mto.19.25.3/mto.19.25.3.medina.gray.html.
[62] Richard Stevens, and Dave Raybould, 'Designing a Game for Music Integrated Design Approaches for Lucid Music and Interactivity', in *The Oxford Handbook of Interactive Audio*, ed. Kasey Collins, Bill Kapralos, and Holly Tessler (Oxford: Oxford University Press, 2017): 147—166.

2. Sound effects (SFX): these synchronise directly with players' actions and interactive objects to communicate meaningful game information: for example, the sounds associated with running or jumping, picking up an object, etc.

3. Voice Over (VO): speech of the characters, audible lines of text, etc.

Whether the media space is linear or interactive, the media provides a space for music and sounds (SFXs, foley, noise textures and others). The media space can be musically designed for narrative actions and emphasise the emotional dynamics with underscore and SFXs. With my research, I look at the media spaces in the way of designing musical structure in linear and interactive ways.

In VR, the space designed is a virtual space, and we, as humans, perceive this virtual reality as 'virtuality'. Katherine Hayles argued that it was cybernetics that contributed to the separation of the 'mind' from the 'body'[63]. In virtual reality, we place our 'mind' in the body of a virtual avatar. We perceive the virtual space as a space in which we will be operating accordingly to the rules afforded by the media. Our natural body receives information patterns from the media, and we interact with this information accordingly to the game design, music design and the logic of the virtual objects. During the interactive narrative, the user interacts with the game design/music design and creates their own interpretation of the interactive narrative.

The initial concept was found in a science fiction story of Stanley Weinbaum *Pygmalion's Spectacles*. 'The story's main character wears a pair of goggles which transports him to a fictional world which stimulates his senses aptly and features holographic recordings. Some consider it to be the origin of the virtual reality (VR) concept as this story

[63] Nancy Katherine. Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics* (Chicago: University of Chicago Press, 2010).

was a good prediction of the aims and achievements of the future'[64]. In 1956, the development of VR machines started to appear. For example, Morton Heilig created *Sensorama* in 1956 (patented in 1962). It was a TV monitor with built-in binoculars where a human being would look and imagine himself/herself being present in the given environment. *Sensorama* had six films, one of which was a dance film, *Belly Dancer*, that can be considered the first VR dance piece. In 1960, Heilig invented another device, *Telesphere Mask*, a device which can be worn on a face, and which is the closest device to the current VR headsets. 'This provided stereoscopic 3D images with wide vision and stereo sound. There was no motion tracking in the headset at this point'[65]. Since the development of *Sensorama*, over a few decades VR developers are experimented with the technological affordances at the time to create relisting virtual spaces (*Ultimate Display* (1965) by Ivan Sutherland, *Virtuality* (1991) by SEGA, *Virtual Boy* (1995) by Nintendo, etc.); the experimentation and development of the VR technologies is undergoing constant growth.

In 2015, Samsung Electronics and Oculus introduced a partnership between companies in making VR experiences for mobile phones (Gear VR for the Samsung Galaxy phones). Due to my collaboration with ARM (Cambridge) on *VR Circuit* (2016), I explored the technical affordances of the Gear VR and implemented the knowledge gained from *VR Circuit* into *Plasticity* (2018). At that time, screendance practitioners were engaging with the 360 degrees videos, rather than creating gamified screendance experiences, as in *Plasticity*. For example,

[64] Dom Barnard, 'History of VR - Timeline of Events and Tech Development', virtual speech, August 6, 2019, accessed August 27, 2022, https://virtualspeech.com/blog/history-of-vr.
[65] Dom Barnard, 'History of VR - Timeline of Events and Tech Development', virtual speech, August 6, 2019, accessed August 27, 2022, https://virtualspeech.com/blog/history-of-vr.

the 360 degrees screendance video for the VR Gear *Through You* by dancers Joanna Kotze, Amari Cheatom, Marni Thomas Wood, and composer Mark Delhi Antoni[66].

Integration of VR experiences to mobile devices at a time seemed convenient for users to avoid buying expensive headsets. However, it caused limitations for mobile devices, as these have their own technological capacities and limitation in running complex game experiences; this is why the Samsung Gear VR did not gain much popularity with the public.

Meanwhile, in 2014 Facebook bought Oculus and started incorporating VR technologies into the company's brand. In 2020, the Oculus Quest 2 was released to the public, and in 2022, the Oculus Quest 2 headset was re-named as MetaQuest by the company directors. The technological affordances of this device are advanced in comparison with the mobile VR applications; these affordances opened opportunities for developers and creative practitioners to create and implement the new wave of VR pieces. For example, *Dance Central* teaches players how to dance; *OhShape* allows players to dance to the rhythm and create postures in accordance with the game's guidance. *AudioTrip* and *Beat Saber* are rhythmic games that allow users to engage with the music by hitting flying objects in time with the music. On the other side, there are VR experiences that are focusing on musical engagement, for example *Electronauts* give a player an opportunity to engage with the musical elements; however, the element of dance is missing here. *Tube VR* allow players to attend virtual clubs and dance as an audience or participate as a DJ. However, through *Journey Through EDM Environments*, which was designed for the Oculus Quest 2 headset, I experiment with the screendance, by filming the dancers and making digital avatars, adding element of musical engagement, by

[66] Rebecca Hills-Duty, 'Update: VR Dance Performance Through You Released on Gear VR', GMW3, August 2017, accessed August 27, 2022, https://www.gmw3.com/2017/08/vr-dance-performance-through-you-released-on-gear-vr/.

placing triggers, and providing the gaming experience by giving a player an opportunity to engage with the designed level environments. This is my contribution to knowledge.

Jaron Lanier established the term VR in 1989 as 'Virtual Reality is the use of computer technology to create the effect of an interactive three-dimensional world in which the objects have a sense of spatial presence'[67]. Another early definition of Virtual Reality by NASA as Virtual Interactive Environments Workstation (VIEW, 1986) lab[68]. Scott Fisher and the University of North Carolina were adapting the term Virtual Environment (VE). The debate about the definition arose in establishing the term and the function of the technology. Virtual Reality does not physically transpose a human being into another reality but rather creates an artificial illusion of the virtual space and experiences using programming game technologies.

To summarise, the screendance, game and VR mediums allow me to express my interdisciplinary practices with movement. For example, in *Plasticity*, I include the reverse functions of cinematic underscore, narrative, and placing screendance videos into a video game environment (utilising Virtual Reality headset). With this piece, I synthesise previously researched media forms (screendance and video games) and explore how my compositional approach to linear and vertical structures shapes the movement of gameplay. This is my contribution to knowledge in relation to the way I am using technologies and VR (see more on this in Chapter 3).

[67] Steve Bryson, 'Virtual Reality: A Definition History - A Personal Essay', December 16, 2013, accessed August 27, 2022, https://arxiv.org/pdf/1312.4322.pdf.
[68] Steve Bryson, 'Virtual Reality: A Definition History - A Personal Essay', December 16, 2013, accessed August 27, 2022, p.2, https://arxiv.org/pdf/1312.4322.pdf.

Chapter 1: Composer as Choreographer

This chapter explores the relationship between visual movement and audiovisual composition. I will demonstrate how visual and conceptual movement drives/affects the creative process. I will examine how my exploration of movement manifests in different media contexts (screendance, games, and VR). I also suggest aesthetic novelty in synthesising EDM into screendance media.

The visualisation of abstract musical ideas through the medium of painting has been core to my creative practice and was the inspirational starting point that brought me to the concept of *movement* as *dialogue*. As my practice evolved, I started to look at movement as combining core elements of dance, the moving image and sound. I challenged myself to understand how composition can engage creatively with movement in a variety of media.

My compositional process is linked to visual art; I often paint as a means of exploring my own emotional reflection and response to corresponding musical ideas and inspirations (*Figure 6*). My musical/visual, associative language is not synaesthesia but rather an internal 'warming-up' process which helps me to focus and identify the primary conceptual idea. I am inspired by Abstract Expressionism and the paintings of artists such as Mark Rothko, Jackson Pollock, and Willem de Kooning, whose work makes me think about the aural/visual connections in art — an abstract visual expression of movements. That said, this initial painting that I create is more concerned with capturing an emotional, intuitive aspect of the work[69]. This process enables me to think about structure in my music in material terms because the music has already been 'objectified' into a visual form.

[69] Judith Zilczer, 'American Rhapsody: From Modern to Postmodern in Visual Music', in *The Oxford Handbook of Sound and Image in Western Art*, ed. Yael Kaduri (New York: Oxford University Press, 2016): 19.

Figure 6. Painting for the screendance piece 'Collage'

The practical visualisation of compositional ideas (as a personally developed process of emotive reflection through painting) came from my experience in classical piano performance. Training for eight hours a day as a child was a formative experience for me. This extensive practice was further combined with education about composers' ideas, dramaturgy, tradition and technique, and many other aspects. Each piece of repertoire that I studied from this time onwards has had an influence on my musical thinking, such as an intuitive pianistic conception of musical material as 'melody' and 'accompaniment'. When I took these pieces to the stage, I performed the repertoire and, after the performance, the cycle of new intensive music study would start again. It was astonishing that such intensive practical dedication was to be lived only during the very short period of performance.

Without having an opportunity to record performances in my childhood, I was unable to listen to the result of my produced work afterwards. I felt that I needed to embody my performance, itself a pinnacle of hours of training, into a physical object that was visible. Other pianists, such as Stephen Hough, Viktoras Paukštelis and Keren Hanan have also experienced the link between painting and music in their creative practice through their approach to colour

and tonality, dynamic, intensity, etc. The use of static art for visualisation is often an important stage in the relationship between the visual and musical before movement is introduced.

The desire to turn my music and sounds into 'object' is what attracted me to music technologies and the use of DAWs as a compositional tool. These technologies allow me to work directly with music and sound, fixing them to the substance of recorded time. In the words of Brian Eno, the recording studio puts 'the composer in the identical position of the painter - he's working directly with a material, working directly on a substance, and he always retains the options to chop and change, to paint a bit out, to add a piece'[70].

I consider my compositional practice choreographically in two ways: first, in the sense that, in projects where I am composing to existing dance, my composition creates the fusion of music and image that is fundamental to choreography. Secondly, and as an extension of the first idea, in later projects, I guided the dancer's movements through a combination of directing and editing. In the vein of the 'expanded field' of composition, these choreographic elements were part of the compositional process of my auteurship over the pieces. In both senses, I formulate the 'movement' of the integrated audiovisual artwork.

Approaching my compositional practice as choreography led me to look at the nature of choreography in dance. A choreographer can be a person who constructs and dictates the specific moves for a dance piece. Alternatively, a contemporary choreographer can guide dancers to stimulate their moves for constructing the choreography of a piece; in this case, the dancers are the creators, and a choreographer is a leading person who directs the process. For example, Christopher Bruce and Jirí Kylián are 'labelled 'mainstream' choreographers – they

[70] Brian Eno, 'The Studio as Compositional Tool', in *Audio Culture: Reading in Modern Music*, ed. Christopher Cox and Daniel Warner (New York, NY: Bloomsbury Academic, 2017), 185—188.

use highly skilled dancers, they generally have themes to dance about, they create symbols abstracting the essence of the idea'[71].

> The choreographer interacts with the original idea and overall plan for the dance; the performer will tend to be more concerned with bringing a unique understanding to one role in relation to the whole dance. However, both choreographer and performer are concerned with perceiving and resolving an artistic problem or idea in a unique way through execution in the medium of motion[72].

The creative process of choreography engages with the initial intensive idea for the creative practice, the dancer, who will embody and express the movement, and the medium of dance. 'During choreography or the development of the dance work, the choreographer is the primary creative force, generating the images with which the performers will work. However, the dancer is often argued to be a co-creator of the dance: without dancers, there is no dance. The performer is an artist who "brings" the dance to the audience by interpreting, presenting and "explaining" the work of art through intentive movement. …The dancer, through the act of moving intentively, shapes the movement to convey the meaning of the idea of the dance to the audience'[73].

Elizabeth Gibbons emphasises the importance of taking into account the dancer's artistic personality and field of dance style expertise, rather than bodies as objects. She elaborates that the specifics of the dancer's training in styles, traditions, and contextual situations affect the choice of movements that the dancer selects in improvisational activities.

The relationship between dancer and choreographer is happening interactively. The technical abilities of a dancer allow dance improvisation to take place and establish specific

[71] Jacqueline Smith-Autard, *Dance Composition*. 6th ed. (London: Methuen Drama, 2020), 86.
[72] Elizabeth Gibbons, *Teaching Dance: The Spectrum of Styles* (Bloomington, United States: AuthorHouse, 2007), 200.
[73] Elizabeth Gibbons, *Teaching Dance: The Spectrum of Styles* (Bloomington, United States: AuthorHouse, 2007), 192.

moves. The choreographer creates structure from the set of improvised movements of a dancer, shape, directs or reject them; observes the process of the dancer's interpretation of the choreographer's idea[74].

Accordingly to Jacqueline M. Smith-Autard, a movement of a human being or a dancer can be caused by various stimuli and interpreted either in a literal or an abstract/symbolic way. For example, the emotive expression: 'the lumped body and slow heavy walk are easily seen to be symptomatic of depression or sadness, the tapping fingers of agitation or anger, the hands clenching and rubbing together of nervousness or fear'[75].

Rudolf Laban, the choreographer and movement theorist of the 20th century, observed and analysed human movements. In his theories of movement analysis, he established common aspects, which he defined in his notation system of movements, *Kinetography Laban* (or Labanotation)[76]. He identified that physical movement is not the only movement that humans create but also the movement of the mind and inner responses to it. He analysed the relationship of the body-mind movement of a human body in his work. 'Laban offers a comprehensive systematization of quality in movement. Qualities, which are called Efforts, are divided into four basic components: space, time, weight, and flow'[77]. Interestingly, Laban focused on the geometrical position of his parameters/efforts (weight, space, time, and flow) to capture the movement of a human body in the environment. He draws images of a moving body in a three-dimensional way to capture and notate movement.

Defining and notating movement in a three-dimensional space, to me, is a visual representation of a body as a visual object (or medium) that facilitates movement, a

[74] Elizabeth Gibbons, *Teaching Dance: The Spectrum of Styles* (Bloomington, United States: AuthorHouse, 2007), 196.
[75] Jacqueline Smith-Autard, *Dance Composition*. 6th ed. (London: Methuen Drama, 2020), 17.
[76]Samuel Thornton, *A Movement Perspective of Rudolf Laban* (London: Macdonald & Evans, 1971), 60.
[77] Elizabeth Gibbons, *Teaching Dance: The Spectrum of Styles* (Bloomington, United States: AuthorHouse, 2007), 204.

choreographic object. However, the movement of a dancing body is not the only aspect of choreography; in addition to this, the space/location, physical objects, and contextual situations, etc. All the visual, audible, conceptual, and stylistic aspects that comprise a piece are the elements of choreography[78].

Other aspects of movement in a dance context can be understood as:

- Movement as a language that expresses a specific cultural or aesthetic situation.
- A literal movement expresses a particular move, which can be found in everyday activities.
- An artistic movement expresses the dancer's interpretation of a theme or idea of a piece.
- Or movement itself as stimuli for a choreographic composition.

From the dance choreography perspective, 'stimuli for dance compositions can be auditory, visual, ideational, tactile or kinaesthetic'[79]. 'The stimulus forms the basic impulse behind the work and then goes on to structure it'[80]. In my practice, I use movement as a stimulus for my creative practices (*Loneliness*).

With influences of painting on one side and music technology on another, I needed another media dimension for the expression and application of the idea of the 'movement-led structures' in my creative practice. My research-through-practice investigates specific audiovisual relationships, their behaviour, and affordances in relation to movement. This framework allows me to explore and expand the possibilities of my compositional techniques,

[78] Jacqueline Smith-Autard, *Dance Composition*. 6th ed. (London: Methuen Drama, 2020).
[79] Jacqueline Smith-Autard, *Dance Composition*. 6th ed. (London: Methuen Drama, 2020), 29.
[80] Jacqueline Smith-Autard, *Dance Composition*. 6th ed. (London: Methuen Drama, 2020), 31.

to look at audiovisual semiotic[81] relationships in their affordances[82] to each other and to critically analyse inner dynamics and flow.

To sum up, once the possibility of dealing with music as an object is prepared, and upon having worked with available media that has a finite visual form, I connect visual objects to music using movement. Thus, movement is the unifying element and the foundational concept that I am exploring in this portfolio: linear and vertical techniques, audiovisual synchronisation through SFX, and the ecology of environmental sound design.

When creating music and sound for various communicative, emotive, or atmospheric purposes – whether they are supporting a narrative or simulating physical properties – I am aiming to provide musical information that gives the listener/viewer/player with a range of related possibilities, or what Gibson refers to as 'affordances'[83].

Belgian screendance artist Thierry De Mey, being a composer and dancer, emphasises the importance of movement in screendance: rhythmic choreographic, cinematic, and responsive spaces (contextual environment of the background moving image). De May's screendance films are exact in framing, detailed edited, and highly musical qualities[84].

In my compositional language, movement has two distinct elements. On a larger scale, the movement in music is a flow of narrative, which might contain a set of 'cues' (long musical cues, which are my interpretation of an emotive/stylistic underscore): the devices that create the timescale of the whole piece, setting the mood, guiding the texture, and progressing the musical ideas. (*Figures 7* and *8*)

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[81] Wendy Leeds-Hurwitz, *Semiotics and Communication: Signs, Codes, Cultures* (Hillsdale, N.J.: Lawrence Erlbaum, 1993).

[82] Eleanor J. Gibson, *Perceiving the Affordances: A Portrait of Two Psychologists* (Hove and New York: Psychology Press, 2013).

[83] W. Luke Windsor, and Christoph De Bézenac, 'Music and affordances', in *Music Scientiae* 16, no.1 (2012).

[84] Sophie Walon, 'Poetic Phenomenology in Thierry De Mey's Screendances: Open Corporealities, Responsive Spaces, and Embodied Experiences', *The International Journal of Screendance* 4 (2014): 28.

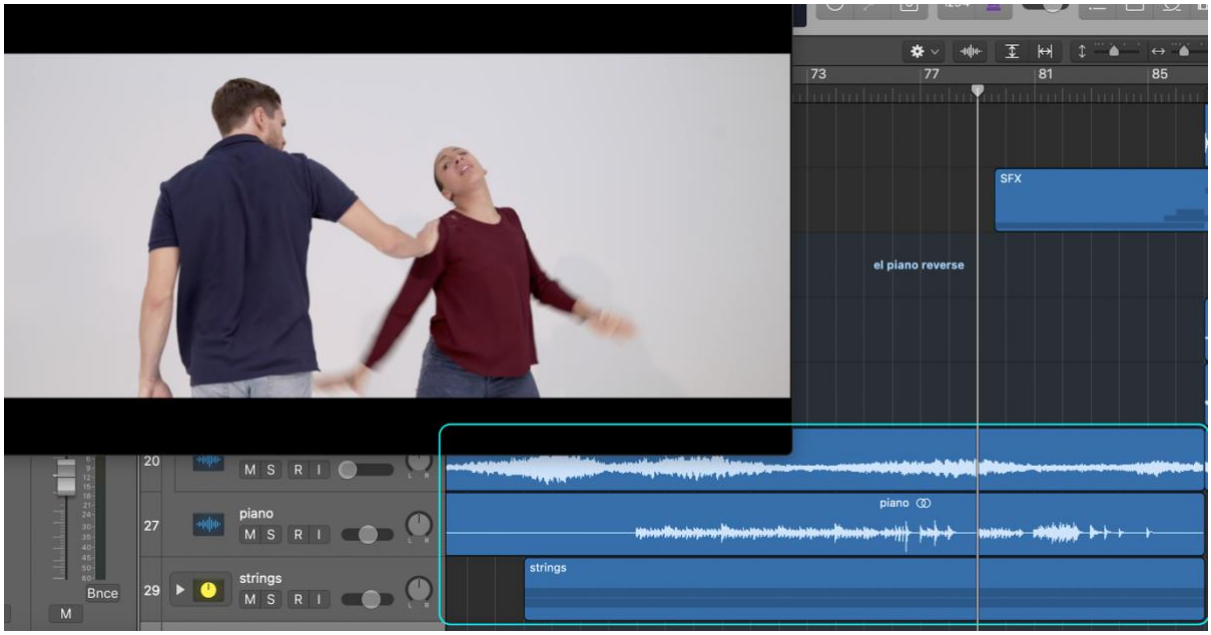

Figure 7. Stay, an underscore example.

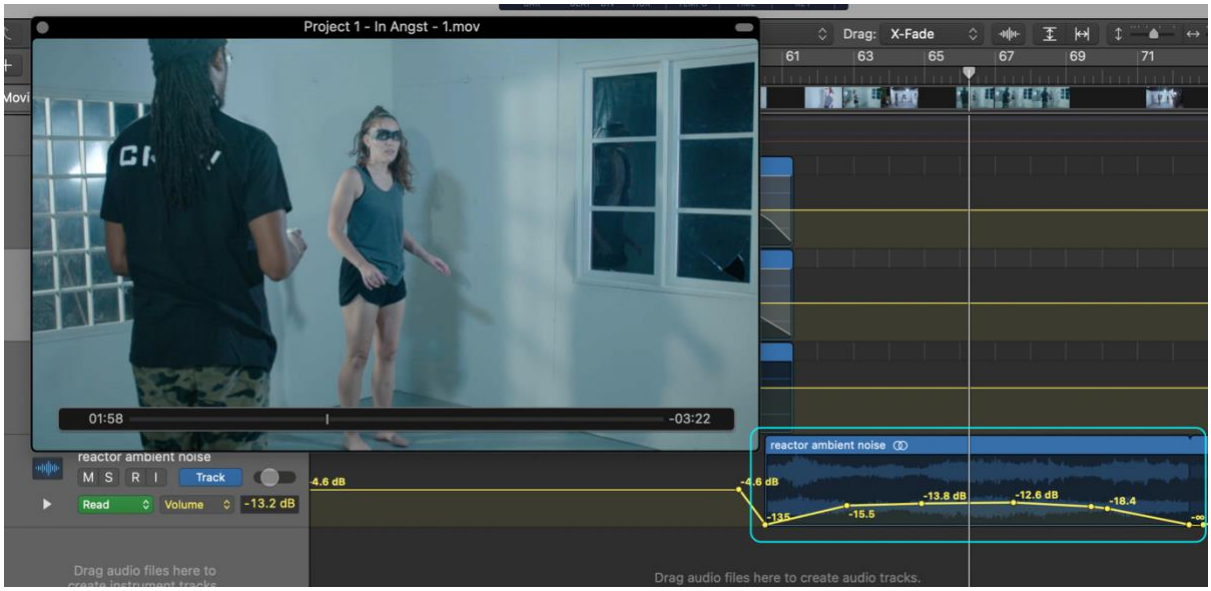

Figure 8. In Angst, an underscore of anxiety feelings with the noise texture.

My compositional language here is informed by ideas of film music cognition (eye and hearing cognition)[85], listener/player perception (tonal harmonies, consonance, dissonance, melody and hybrid instrumentation), semiotic relationships, categorisation and prototype

[85] Kathryn Kalinak, *Settling the Score: Music and the Classical Hollywood Film* (Madison: University of Wisconsin Press, 1992), 21.

theory[86] (which supports the choice of EDM style structures, in terms of interactive-friendly elements — beats/loops/textures/or vertical re-orchestration), and evoking emotions through the choice of style and genre (schematic expectations)[87], which is oriented so that the player/listener enjoy the gameplay as a suitable aesthetic approach for this work. (*Figure 9*)

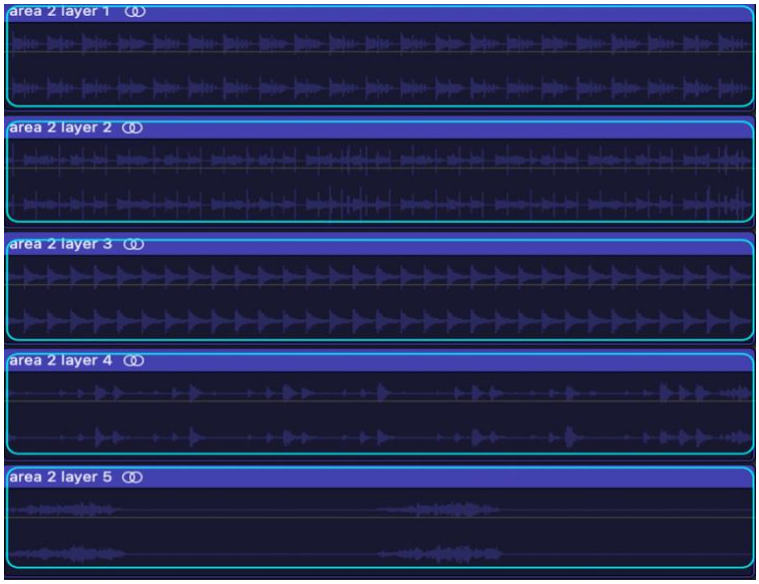

Figure 9. Plasticity, musical parts for the interactive area 2.

On a smaller scale, movement also refers to a precise moment, the entanglement of kinaesthetic relationships of audiovisual synchronisation through SFX (short audio elements): body movement in screendance (on the dramatic/climactic points) (*Figures 10-13*), a character's gesture or action in a video game and VR. For example, in the video game *Cube*, the 'cinematic underscore' runs throughout the entire level and sets the scene and dramatic sense, whilst the SFX responds and corresponds to the player's actions. Here, I designed sound effects to create environmental immersion and composed musical material for the emotional representation of the narrative context.

[86] Florian Hantschel and Claudia Bullerjahn, 'The Use of Prototype Theory for Understanding the Perception and Concept Formation of Musical Styles' (Proceedings of the 14th International Conference on Music Perception and Cognition, San Francisco, July 5—9, 2016).

[87] Paul Draper and Frank Millward, 'Music in Perpetual Beta: Composition, Remediation, and "Closure"', in *The Oxford Handbook of Music and Virtuality*, ed. Sheila Whiteley and Shara Rambarran (New York City: Oxford University Press, 2016).

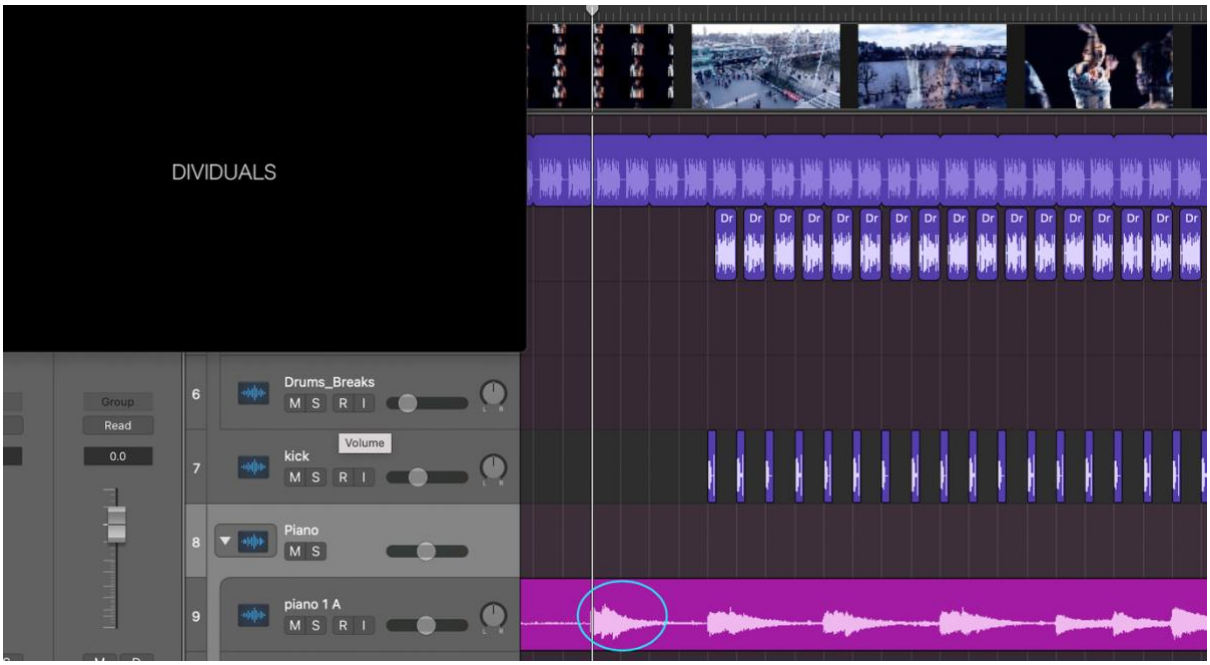

Figure 10. Dividuals, an audiovisual synchronisation of the title with the piano melody.

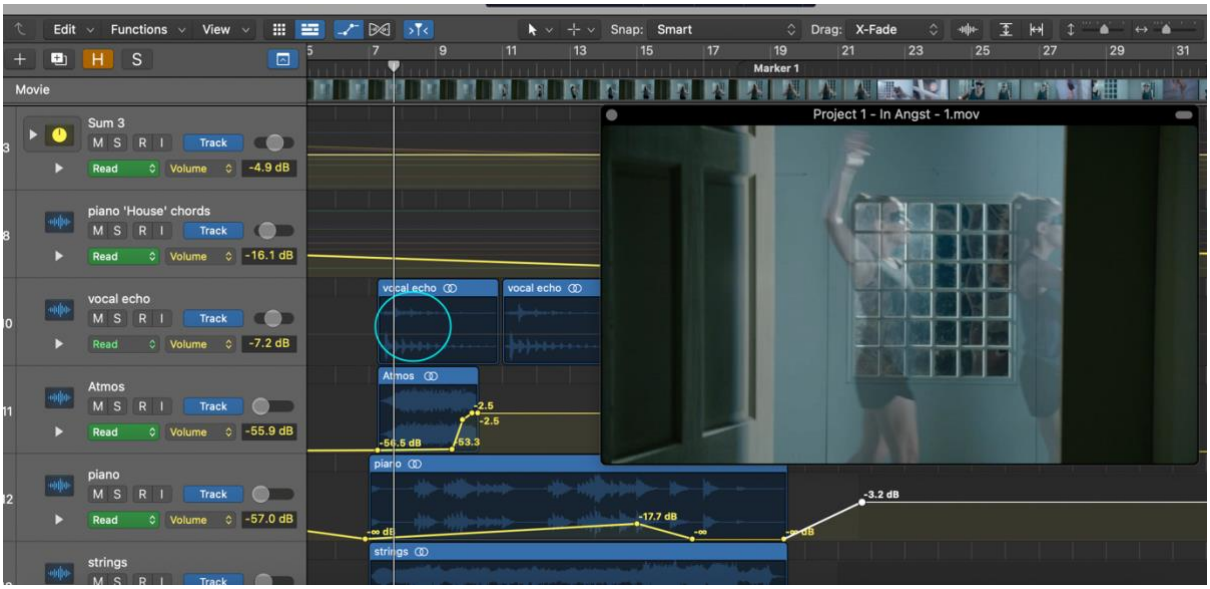

Figure 11. In Angst, an audiovisual sync point of a hand movement with the vocal echo audio file.

Figure 12. Stay, an audiovisual sync point of a 'hit' movement with the SFX.

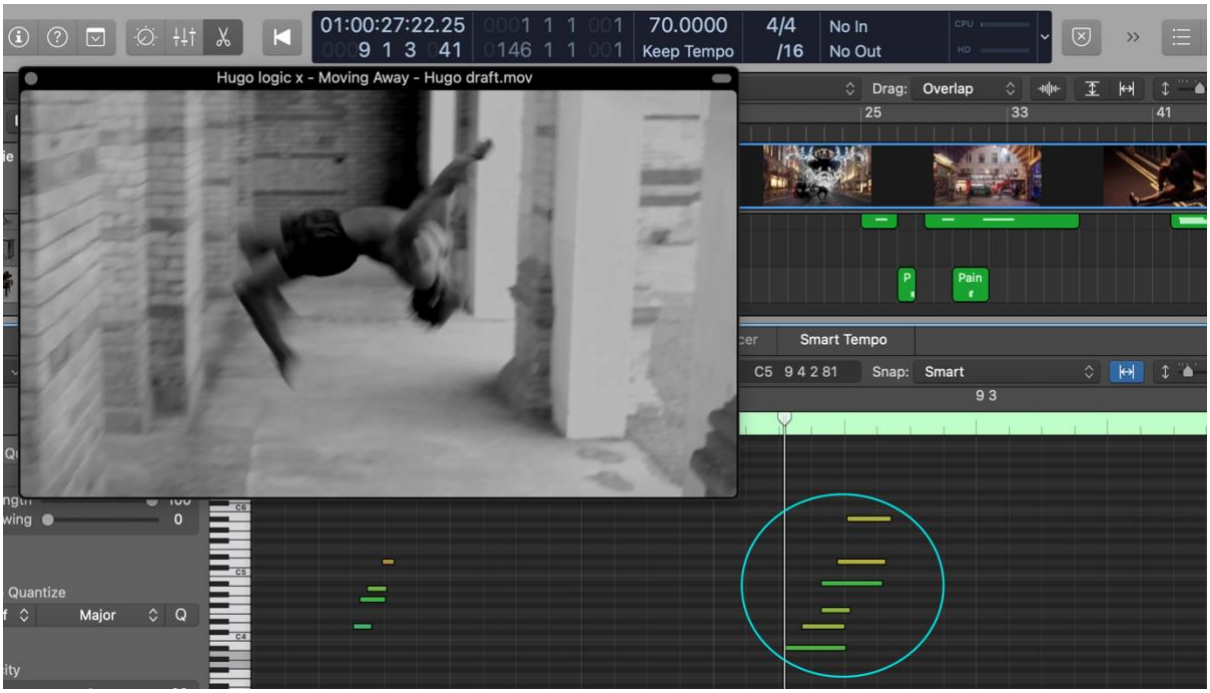

Figure 13. Moving Away, an episode with Hugo Cortes, an audiovisual synchronisation of a dancer's jump movement with the arpeggiated piano melody.

The number of sync points (SFX) can be large or small, depending on my artistic interpretation of the visual image. (*Figure 14*)

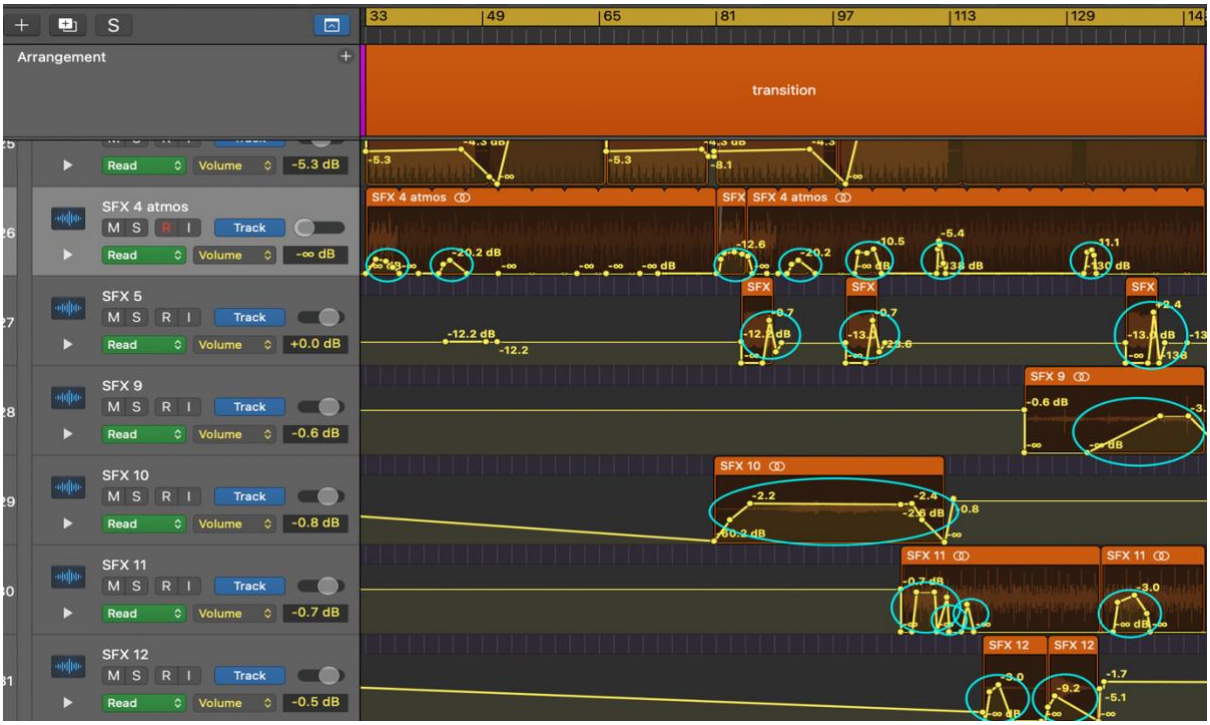

Figure 14. Plasticity, the Transition section, an audiovisual synchronisation of the dancer's movements with the SFXs.

Composing for the moving image made me consider the elements of movement musically, where the distinction of these movements (the movement of the dancing body, movement of the moving image, movement of the video editing, structural form progression, movement of environmental objects of the media space, etc.) determines the length, tempo, instrumentation of musical elements shaped around movements. If looking overall at my portfolio compositions, it is observable that these are combinations of cues and sync points that emphasise movement — conceptual/aesthetic movement is emphasised with cues, and visual movement is emphasised with sync points. The visual material itself drives/affects the development of my creative process.

Influences and Inspirations:

I have gained much experience in composing for dance through my interdisciplinary collaboration with *The Motion Dance Collective*, piano playing for classical ballet classes,

eurhythmy[88] artists and contemporary dancers. This experience has allowed for the development of improvisational skills, which are integral to my everyday creative practice and involve the use of a MIDI keyboard connected to DAW software to record my improvisations. I then listen back to the recorded material, select parts, or elements, which in my opinion will be suitable for a particular concept of the piece, edit and organise them into a composition. This approach of the 'studio as a compositional tool' is a common technique for many artists (Brian Eno, Gavin Bryars, Nico Muhly, Ken Ueno) and additional mode of compositional engagement[89] in today's practice.

My musical approach for composing music for dance draws inspiration from silent film and vintage animation soundtracks. At times I have been inspired by Charlie Chaplin's films, as well as the music of cartoons such as *Tom and Jerry* and Disney's *Mickey Mouse*, which have informed my own sense of kinaesthetic relationship between music and movement. These influences are observable in one of my early compositions for screendance, *Meaning of Life*[90], where I frequently synchronised the rhythm of melodies with dance gestures.

Karen Wood, in *Kinaesthetic Empathy*, describes the kinaesthetic experience as follows: a person watches dancing, and while she does none of the physical work herself, she is capable of experiencing the rhythm of the performance as though it was in her own body[91]. *Kinaesthetic experience* can thus be defined as the sensation of moving while watching

[88] Arild Rosenkrantz, *Eurythmy the Art of Movement: As Inaugurated by Rudolf Steiner at the Goetheanum, Dornach, Switzerland* (UK: Anthroposophical Publishing Company, 1980).
[89] Andrew Brown, 'Modes of Compositional Engagement', *QUT EPrints*, May 27, 2004, accessed August 26, 2022. https://eprints.qut.edu.au/168/.
[90] Elena Alekseeva, 'Meaning of Life. Music by Elena Alekseeva Choreography and Dance by Michael W L Courtney (Ras Mikey)', January 27, 2014, accessed August 25, 2022, https://www.youtube.com/watch?v=72JItdiXi1k.
[91] Adesola Akinleye, 'Geography of the Body', *Dance UK* 70, (2008): 21.

movement, where the viewer can sense, as Ivar Hagendoorn points out, the 'speed, effort, and changing body configuration' of the dancer as if performing the movement themselves[92].

Cultural theorist Angela McRobbie writes about kinaesthetic empathy and emotional involvement as 'the really important feature about dance ... is that as an art and a representational form, as a performance and a spectacle, it has an extremely strong, almost symbiotic relationship between dance and its public'[93]. However, I shall argue that a crucial aspect of the relationship between dance and its public is the appeal to spectators' kinaesthetic response to dance and movement observation, projecting these movements on themselves, and might be called their 'inner dancer'. De May calls the same phenomenon a cinema of sensations: a video that captures kinaesthetic, physical, spatial, or rhythmic senses, which the spectators project on themselves[94].

With the use of SFX on the climax points of a dancing body, I emphasise audiovisual semantic connection and afford sensory experience for the viewer. Interestingly, game sound theorists apply similar ideas into interactive music: as Collins's kinesonic synchresis[95] and Donnelly's occult aesthetics[96].

The narrative or conceptual idea of the screendance media guides the choice of musical structure and vice versa. These are symbiotic relationships: visual structures and narratives are supplemented by the cinematic underscore, which matches or compliments the audiovisual tempo and dynamics, potentially triggering the same emotional and physical response, which

[92] Karen Wood, 'Kinaesthetic Empathy: Conditions for Viewing', *The Oxford Handbook of Screendance Studies*, Rosenberg, Douglas. Ed. (Oxford University Press, 2016), 245.
[93] Dee Reynolds, "Glitz and Glamour' or Atomic Rearrangement: What do Dance Audiences Want?', *Dance Research: The Journal of the Society for Dance Research*, 28, no.1 (2010): 19—35.
[94] Sophie Walon, 'Poetic Phenomenology in Thierry De Mey's Screendances: Open Corporealities, Responsive Spaces, and Embodied Experiences', *The International Journal of Screendance* 4 (2014): 38.
[95] Karen Collins, *Playing with Sound: A Theory of Interacting with Sound and Music in Video Games* (London: MIT Press, 2013), 37.
[96] Kevin J., Donnelly, *Occult Aesthetics: Synchronization in Sound Film* (New York: Oxford University Press, 2014), 73.

communicates or supports each other. An example of this relationship structure is *Loneliness*, where the video and the narrative guide the musical structure (more on this in Chapter 2).

Synthesis of Aesthetic Styles and Compositional Techniques

In my piece *Journey Through EDM Environments*, I juxtapose contemporary and urban dance in an artificially designed nightclub environment. I suggest aesthetic novelty in placing professional contemporary and urban dancers in this VR environment and playing with EDM and game music compositional techniques (more on this in Chapter 3). Through this piece, I am looking at professional contemporary and urban dancers in an urban social dance context — a nightclub.

Working with dancers as a composer, I started to engage with the dance itself. The majority of my collaborators had a degree in contemporary dance; however, most of them found it difficult to articulate the specific meaning of the term 'contemporary dance'.

Contemporary dance started at the end of the 19th century and the beginning of the 20th venture, where the ideas of modernism were applied in various art movements: music, art, dance, etc. The early contemporary dance practitioners were refusing classical ballet movements to find new ways of expression. However, a hundred years later, these 'contemporary' dance movements established themselves in a specific style — contemporary dance. Contemporary dance as artform was evolving mainly at the dance institutions/academies.

The history of underground dance styles and EDM genres was evolving parallel in a subculture. Urban dancers danced to urban music styles. In popular culture, dance styles, such

as hip-hop or house were evolving. For example, Reynolds states that 'Jack' moves relate to Chicago House music[97].

> Modern dance has often been referred to as "a point of view" and is categorized by its individualistic spirit and individual discoveries, creativity, will, and imagination. Ballet, on the other hand, is often referred to as a "system", and is characterized by a sense of tradition, its relatively long and strong collective history, and a movement vocabulary, pedagogical system, and "rules" for choreography developed over centuries.... contemporary dancers generally study several different genres, and dancers often perform more than one genre, bringing a unique articulation to each[98].

On the other side, club music was originally created for everyone to socialise and dance to the music. The club dancefloor was not dedicated to professional dancers but to ordinary people first. Nowadays, some individual dance practitioners consider EDM music and club space for professional dance performances; however, this practice has not established itself on a larger scale yet. For example, Olivia Shouler fuses hip-hop and contemporary dance, Simone Sistarelli fuses contemporary dance (Release, Cunningham, Flying Low techniques), street dance (Popping, Locking, Breaking), and many others. Similar fusions in dance terminology are called 'fusion dance'. The book *Blurring Boundaries: Urban Street Meets Contemporary Dance*[99] illustrates this aspect of dance fusion in individual dance practices with artists such as Kyle Abraham, Ivan Blackstock, Akram Kahn, and others. Through my piece *Journey Through Urban Environments*, I am bringing these ideas in a conceptual way to see how this will work in practice. In the article, *Screendance in the Wake of Screened Dance: Moving Forward Through Interactive Video*, Callum Anderson proposes the further potential expansion of screendance into interactive or different media forms[100]. The proposed level of interaction is

[97] Simon Reynolds, *Energy Flash: A Journey Through Rave Music and Dance Culture* (London: Faber and Faber, 2013).
[98] Elizabeth Gibbons, *Teaching Dance* (Bloomington, United States: AuthorHouse, 2007), 199.
[99] Kyle Abraham, *Blurring Boundaries: Urban Street Meets Contemporary Dance*, (Leicester: Serendipity, 2016).
[100] Callum Anderson, 'Screendance in the Wake of Screened Dance: Moving Forward Through Interactive Video', *The International Journal of Screendance* 12 (2021): 113.

perceived in interactive videos rather than interactive avatars, which I implemented into *Journey Through EDM Environments*.

This chapter explained the effect of movement on my compositional practices. Using the visual movement of a dance gesture and/or video edits as an influence allows me to shape instrumental parts accordingly to the visual image. The movement of narrative or overall concept helps me to create coherence and dramaturgy of the fragmented compositional sketches/cues into a complete piece. Focusing on movement as a compositional technique allows me to write music for screendance, games and VR. Interdisciplinary thinking allows me to create aesthetic novelty and synthesise EDM into screendance media.

Chapter 2: Modes of Collaboration

> Shared working in artistic creation is embedded in many contemporary arts, particularly performance arts such as modern dance and theatre... the fact that composers commonly work with others while writing is simply a necessity in certain forms such as opera, dance or film[101].

Composing music for screendance, games, and VR allowed me to collaborate with artists from different disciplines: dancers, film directors, editors, game developers and others. The working process of collaboration opened opportunities for creative and technical discussions between the participants, which led us to be inspired by one another, learn, and generate new ideas.

> Video dance is a hybrid practice that brings together two different art forms – video and dance – which themselves incorporate many different creative elements such as design, lighting and sound – and this gives it enormous creative potential. It almost means that in almost every case the production process will involve different artists and technicians coming together to work towards one goal[102].

Through this chapter, I present my responses to the research questions: how does collaborative practice shape the outcome of an audiovisual composition? How do modes of collaboration affect the development of the finished composition? How does collaborative communication affect the development/negotiation of personal voice? I will explain the journey of my collaborative practices, which led me to find my compositional voice as an interdisciplinary composer.

Karen Savage and Dominic Symonds, in their book *Economies of Collaboration in Performance*[103], link collaborative activities with the ideas of Marxism, socialism,

[101]Alan Taylor, "Collaboration' In Contemporary Music: A Theoretical View', *Contemporary Music Review* 35, no. 6 (2017): 562–563.
[102] Katrina McPherson, *Making Video Dance: A Step-by-Step Guide to Creating Dance for the Screen*, 2nd ed. (Oxon and New York: Routledge, 2018), 18.
[103] Karen Savage and Dominic Symonds, *Economies of Collaboration in Performance: More than the Sum of the Parts* (Basingstoke, Hampshire: Palgrave Macmillan, 2018).

cooperativity, collectivism and communality. The authors draw the parallel of people's connectivity as bees in a beehive, where collaborators make an individual input their labours to one shared goal — collaboration as co-labour. The contribution of individual collaborators can be creative, practical, technical, or simply supportive; people are contributing towards one shared goal from different sides.

'Roschelle and Teasley define collaboration more specifically as “mutual engagement of participants in a coordinated effort to solve a problem together”'[104], Emily R. Lai defined collaboration in the context of learning as "a situation in which two or more people learn or attempt to learn something together"[105]. I use creative collaboration for three reasons: an opportunity to learn the aspects of other disciplines from my collaborators through practical activities; and an opportunity to observe how different contextual situations or modes of collaboration affect the final piece; and an opportunity to generate new interdisciplinary ideas as 'generative ideas emerge from joint thinking, from significant conversations, and from sustained, shared struggles to achieve new insights by partners in thought'[106].

Aaron Copland, an American composer of the 20th century, explains the creative process behind music composition and states that every music composition starts from an idea. These musical ideas, or so-called musical starting points, can emerge into a complete composition or can be written down for further usage. Copland compares composers with collectors of ideas. These ideas 'may come in various forms'[107] and can be rhythmic, melodic, harmonic, sound timbre, structural, concerned with arrangement, and others. Creative thinking,

[104] Emily R. Lai, 'Collaboration: A Literature Review', (London: Pearson, 2011), 5.
[105] Emily R. Lai, 'Collaboration: A Literature Review', (London: Pearson, 2011), 4.
[106] Vera John-Steiner, *Creative Collaboration* (Oxford: Oxford University Press, 2006), 3.
[107] Aaron Copland, *What to Listen for in Music* (New York: McGraw-Hill Book Co., 1939), 19.

writing down musical ideas, their collection, and their testing (application) is a large part of a compositional craft at the start of the creative process.

During my practice-based research, I found myself in a position where, at the start, I lacked 'compositional ideas' for interdisciplinary practices. 'Hidi and Harackiewicz (2000) frame the issue in terms of situational interests. Accordingly to this perspective, working with others is a way to enhance situational interests that can ultimately trigger personal or individual interests'[108]. Coming from a musical background, I decided to surround myself with people, collaborative practices, and different contextual situations with the purpose of generating new ideas for interdisciplinary compositions. Because that initial seed/idea can inspire and influence the further development of a piece and determine its trajectory.

The creative process of making screendance, games and VR starts very similarly to music composition — it starts with an idea. However, that idea is not necessarily musical; it is rather the overall conceptual idea that includes holistic thinking about other elements of the final piece itself — a specific theme/or storyline of a piece, choreography, filming, game design, number of participants on a project, music, sound, space/location and other. The portfolio of work represents a selection of individual pieces with their themes or storylines. For example, *Loneliness* engages with the idea of loneliness of a person, *Moving Away* episodes focus on dancers' experiences of performing abroad, *In Angst* engages with the idea of creative anxiety, etc. When the idea is defined, and the number of participants is arranged, then the creative process begins of translating that idea into an art form itself: screendance, games, or VR. 'Everything else builds from the decision to work together and the resulting collaboration'[109].

[108] Emily R. Lai, 'Collaboration: A Literature Review', (London: Pearson, 2011), 22.
[109] Katrina McPherson, *Making Video Dance: A Step-by-Step Guide to Creating Dance for the Screen*, 2nd ed. (Oxon and New York: Routledge, 2018), 3.

The portfolio shows a wide-ranging variety of collaborations and their dynamics in the creation of music for the media. From project to project the level of my personal collaborative involvement varies from setting instructions and influencing dancers to improvise in silence, to working for a director, re-composing music for already made videos, or directing the entire process.

Scholars have been considering how collaboration works in creative scenarios over many years. Recent examples include Takashi Iba with Iba Laboratory, who has researched collaboration patterns and its languages[110], where he defined the core patterns of collaboration and the patterns for a good team. In addition, Vera John-Steiner has researched aspects of creative collaboration: emotional dynamics of collaboration and collaborative patterns among artists and other aspects[111]. In my research, I also look at collaboration as a shared practice, which has its own dynamics, movement, and process. The outcome of these collaborative practices is determined by collaborators' professionalism, professional relationships, and creative practice time. Due to these aspects, the result of a collaborative practice most of the time is different, depending on these 'live issues'.

Working on the portfolio, while seeking collaborators, I was looking for people with shared interests and professional competency who could complement and benefit the project's needs with skillsets outside my areas of expertise.

Creative inspiration and mutual admiration fulfil the artistic and emotional need for collaboration. Funding of the project or personal determination driven by non-financial reasons can benefit a successful collaborative partnership. 'Like an extended family, a collaboration

[110] Takashi Iba, *Collaboration Patterns: A Pattern Language for Creative Collaborations* (Iba Laboratory, Japan: Creative Shift, 2014).
[111] Vera John-Steiner, *Creative Collaboration* (Oxford: Oxford University Press, 2006).

bears the complexity of human connectedness, strengthened by joint purpose and strained by conflicting feelings'[112].

Creative collaboration is a network of relationships where mutual artistic interest, finances, personality, and emotions can influence or affect the dynamics of collaboration. Vera John-Steiner writes about the reasoning for human collaboration — emotional and cognitive connection, the economic force, artistic interdependence, and integrative collaboration (where creative contribution transforms collaborators' minds for further works). She also suggests that complimentary temperaments, confidence and trust can positively affect collaborative activity.

Composing music for popular/commercial art forms is essential considering a market-driven mainstream industry. As Joe Bennett writes, 'The economic mechanism that drives audience approval of songs have another important effect - they shape the art form itself'[113]. The creative expression of my compositional voice is established between the self (personal execution of creative musical ideas), market-driven industry climate (stylistic, sonic or genre preferences) and collaboration.

The work with media requires engagement with its concept, story, or narrative. I design the framework considering sonic expectations from my collaborators and the stylistic climate of the current music market. I would use the concept of media, my approach to movement and collaboration as a stimulus for generating musical ideas. After collecting these ideas, I would organise them creatively into my first musical draft. From that point, the work itself becomes subject to collaborative edits, negotiation, collaborative reflection, and nuances adjustments until the final satisfaction of collaborators or until the project's deadline.

[112] Vera John-Steiner, *Creative Collaboration* (Oxford: Oxford University Press, 2006), 91.
[113] Joe Bennett, 'Collaborative Songwriting: The Ontology of Negotiated Creativity in Popular Music Studio Practice', *Journal of the Art of Record Production* 8 (2013): 1–9.

To collaborate successfully on an audiovisual project requires a generation of many versions of the organisation of sonic material, audio, and video files. This organisation process facilitates a workflow of collaboration and gradual refinement, which includes aural audition, negotiation, and sending files to collaborators back and forth. The 'finished' media, with music/sound and visual element combined, is considered a primary text, and it is the type of media and its modes of production and consumption that dictates musical structure, instrumentation, timing, etc.

In my creative practice, music composition for media is an interdisciplinary collaborative process. The people who contribute to an art piece have different roles and responsibilities. The process itself can vary from face-to-face collaboration to working at a distance when collaborators are sending pieces of their drafts to each other through the internet.

The post-production video editor is responsible for video editing, while the composer is responsible for the music. It is also common that one person is responsible for several roles: composition, production, video editing, etc. For example, Michael Price, when working on *Sherlock*, was responsible for music composition, conducting, production, mixing, etc. When a team works on a project, even with a shared vision, there are differences in the perception of everyone. Potentially, this can lead to a multitude of difficulties between collaborators, including conceptual misunderstanding and differences in aesthetic preferences and interpretation. There are also power dynamics: some people may tend to dominate the project, while others could be pushed into more passive interactions. Finding the right balance of equal collaboration is extremely important. In the collaborative process, problems can occur when the levels of expertise and professionalism are different. It can be very frustrating to work with a beginner, who is technically unskilled to produce the required product. Equally, highly experienced professionals may be too conservative in their views and might not be open to new ideas. Successful collaborative projects can be built on professionalism in each area of

expertise, openness to new creative ideas, a clear vision of a director and a desire to produce an exceptional product.

My conceptual position is that collaborative work on a media piece is akin to a complex system, in which every relationship contributes to the whole and cannot exist without all the other contributions. The piece is not fully originated by any one person. Every collaborator contributes to the artwork and its changing dynamics that often work non-linearly. Collaboration and dialogue happen on many levels, not just between collaborators, but also between, for instance, music and their art form, between ideas and technology, music, and interactivity. At the same time, I also still retain some control in terms of musical style and genre, structural elements, or context. It is this complex intertwinement of not quite predictable unfolding of a complex web of relations and some steering and control, at least within my domain of contribution, which makes collaboration successful.

Sam Hyden and Luke Windsor established three types of collaboration in compositional practices:[114]

1. **Directive**, where the composer directs the collaborative process to accomplish his/her creative ideas.

2. **Interactive**, where the composer interacts and negotiates the ideas with the participants but accepts or rejects them. The author is still in control of the creative output.

3. **Collaborative**, where the collaborative process of all participants collectively determines the outcome.

[114] Sam Hayden and Luke Windsor, 'Collaboration and the Composer: Case Studies from the End of the 20th Century', *Tempo* 61, no. 240 (2007): 33—35.

Through my modes of collaboration, I examine these types of collaboration for creative purposes. In mode 1, 'Composing to Silent Improvisation', I examine the interactive approach. In mode 2, 'Work for a Director', I collaborate under the instruction of a director, where a lead person decides levels of involvement for each participant; this collaborative type can be considered as a directive. In mode 3, 'Re-Composing Music for Already Made Media', I collaborate with participants and the technologies with the purpose of learning from these experiences. In mode 4, 'Composition by Design', I take a directive approach in collaboration for my interdisciplinary practices.

Vera John-Steiner suggests the paradox of collaboration and describes it as 'a working relationship in which partners are equal and in which everyone's voice is heard...'[115] However, the collaborative activities could have a degree of hierarchy, where the director (as an auteur) directs the overall concept and guides the participants. In some cases, collaborators can have an equal degree of involvement. The spectrum of individual involvement of each participant can vary from project to project. George Cruikshank suggests the hierarchical structure of society in Victorian England as an illustration of The British Beehive. 'Cruikshank's Beehive, in short, is a symbol of both a hierarchy and collaboration…'[116]

Lev Vygotsky, a Soviet psychologist, suggests that social interaction affects cognitive development in the process of learning[117]. Vera John-Steiner elaborates, 'Vygotsky's emphasis, as in connected knowing, is on how thinking and knowledge are mediated through interaction with others. Vygotsky's approach values a dialogue that relies on relationships as one enters meaningful conversations that connect with others'[118]. I am inspired by Vygotsky's suggestion

[115] Vera John-Steiner, *Creative Collaboration* (Oxford: Oxford University Press, 2006), 62.
[116] Vera John-Steiner, *Creative Collaboration* (Oxford: Oxford University Press, 2006), 62—64.
[117] Lev Semenovich Vygotsky, *Mind in Society: The Development of Higher Psychological Processes*, translated from Russian and edited by Michael Cole (Cambridge, Mass.; London: Harvard University Press, 1978).
[118] Vera John-Steiner, *Creative Collaboration* (Oxford: Oxford University Press, 2006), 200.

and use modes of collaboration in my creative practice to learn from my collaborators and contextual situations and support it by reading the appropriate literature. However, the collaborative practice itself does not facilitate my main creative priorities. Instead, through exploration of the collaborative modes, I adopt the gained knowledge for my further interdisciplinary compositions *(Plasticity* and *Journey Through EDM Environments*).

To summarise, the observed collaborative patterns can be categorised as follows:

1. Establishing the goal of a project. This can be determined by a director or a group of participants;
2. Establishing the conditions and roles for collaboration. Management of responsibilities before, during and after the project;
3. The practice of creative collaboration: improvisation and establishing the initial ideas, developing the ideas, etc.;
4. Management of the practical and emotional dynamics throughout the process.

Method/Mode 1: Composing to silent improvisation

Loneliness

Loneliness was my first research piece at Royal Holloway. In 2014 I moved to the UK to obtain my PhD at Royal Holloway, University of London. Upon my arrival, I did not have a network of professional connections, dancers, or other collaborators. I felt lonely, detached from my family, friends, and the previous context of things that I used to do. Upon all the above, I was experiencing a breakup of a relationship, and I decided to put it into a music/dance piece. All of these influenced me to express my emotions into *Loneliness*. An interesting paradox, *Loneliness* is a collaborative piece based on the theme of isolation.

When looking for a dance collaborator, my first choice was to look at the people around me, dance students at the Royal Holloway. I contacted Alexandra Martyn-Potts, who was an

MA in Contemporary Performance Practices student. I wanted to find an optimal way of collaborating with the dancer in this piece. At the same time, part of my goal was to give the dancer freedom in her creative process: to express the piece's narrative through the dancer's improvised interpretation without any musical stimulus. Accordingly to Sam Hyden and Luke Windsor, the type of this working process can be described as collaborative[119]; however, under my direction/guidance.

I wrote a set of instructions in a specific order for the storyline of the piece and the structure. Alexandra improvised in silence based on the scenario that I wrote. I then filmed those improvisations and composed music to accompany the movement. The dancer only watched/heard the music after the piece was complete[120].

The scenario: the piece describes the loneliness of a character whose feelings were betrayed by her lover. Different questions are going through her mind. How did it happen? Why? There is no answer, only disappointment, sadness, emptiness, loneliness, and hope.

The structure for the dance improvisation and cues for the cinematic underscore:

1. Presence of loneliness
2. Melancholy
3. Loneliness
4. Hope
5. Loneliness
6. Anger
7. Presence of loneliness

Structure	**Introd uction**	**Hit-point 1**	**Connecting material 1**	**Cue 1**	**Hit-point 2**	**Cue 2**	**Connecting material 2**	**Cue 3**	**Conclusion**

[119] Sam Hayden and Luke Windsor, 'Collaboration and the Composer: Case Studies from the End of the 20th Century', *Tempo* 61, no. 240 (2007): 33.
[120] Elena Alekseeva, 'Alexandra Louise & Elena Alekseeva interview', December 17, 2014, accessed August 25, 2022, https://www.youtube.com/watch?v=hecvy5bmG9c.

Time	0':00'' - 1':16''	0':17'' 0':22''	0':23''- 0':32''	0':31''- 1':07''	1':08''- 1':25''	1':26''- 2':11''	2':12''-2':18''	2':19''- 3':26''	3':27''- 3':55''
SFX/ sync points			0':25''	0':31'' 1':03''		1':39'' 1':43'' 1':47'' 1':52'' 2':02'' 2':06'' 2':11''		2':19'' 2':28'' 2':36'' 2':51'' 3':15''	3':27''

Table 1. Loneliness, structure.

Before I had begun to compose the music, I rehearsed with Alexandra performing her silent improvisation. During rehearsals, Alexandra improvised, and I would direct her with the emotional context of her performance, and we would decide on a specific set of movements, which, in our opinion, looked right. I became more than a composer, through this exploration, I would direct the choreography, dramaturgy, film the video, and shape the piece accordingly to the concept.

On the third rehearsal, I filmed the improvisation, which was then used as the media source for the music composition. Musical 'cues' were composed in relation to each section; then the 'cues' were combined into a continuous musical composition. The structure was defined by the set of cues placed in their linear sequence alongside the narrative, which itself was defined by scenario and enacted in the choreography. I wanted to keep a delicate piano melody as a representation of the general mood of the piece. The melodic phrases are partly emphasising the physical gesture of the dance movements, but this emphasis is fragmental and not too frequent because I wanted to keep a balance between the sync points and the overall mood. I did not want this piece to be over-synchronised and be perceived as mickey-mousing. This is how I keep the listener's attention to the visual connection between sound and movement in this piece. When the piece was finalised, I incorporated additional SFX to make extra sync points, with the same purpose — the emphasis of the connection between music and

the media. This collaboration mode enables the development of the screendance piece as follows: the storyline allows the dancer to improvise in the given framework and to create the visual representation/interpretation of the overall concept; the length of the filmed dance improvisation determines the length of the music; the musical phrases of the composition emphasised the captured dance movements, the shape of melodies, tempo, etc.

The emotional dynamics of this collaboration were mutually positive, open, and transparent. This positive dynamic appeared due to the complimentary temperaments and non-funded shared artistic interest in each other creative practices. We were students who mutually needed this piece for the portfolio. The project was short; it did not require the dancer to spend a significant amount of time after the filming, which is why our collaborative partnership did not cause any conflicts. Using this collaborative mode allows me to stimulate musical ideas based on the storyline, which then embodies the dance movements and afterwards translated into music.

Method/ Mode 2: Work for a director

Moving Away

After exploring the concept of composing music to silent improvisation, I realised that my filmmaking skills weren't nearly up to the industry standards. In order to improve my skills, learn and to further become an auteur, I started to look for professional filmmakers and dancers to collaborate with. I contacted Omari Carter, the screendance practitioner, and offered my skills as a composer for his projects to gain skills — technical, practical, and collaborative. When working on *Moving Away*, I learned how to compose with stylistic expectations in music for the moving image; asking Omari about the dancer's musical preferences; engaging with the dancer's movements, composing cues, and emphasising climatic points with SFX.

While composing, I immersed myself in reading about film music, its techniques and music for dance. I started to get involved with the screendance community. It was important for me to establish myself with the screendance community as a composer, get to know other dancers for further collaborations. I did my best to make sure that Omari was happy with my results.

The emotional dynamics of our collaborative partnership with Omari Carter on *Moving Away* were changeable. At the start, Omari and I had great artistic understanding and creative admiration. I would be excited to see his videos, and he would love my music. My responsibilities would be focused on music composition under his direction of the overall process. Reflecting on this experience, the big challenges arose in creative communication. For example, Omari would send me an incomplete edit of the video, which he would want me to compose my music to, then I would compose my music with details to movement and sync points, and then he would re-edit the footage in a way that my piece wouldn't match it. I then would have to re-compose/re-adjust my music to the new video edits, because the sync points and the music wouldn't fit, and even though the general atmosphere of the overall mood would be there; the connection of movements would be lost. If the video edits are changed, then I re-composed my music to make sure that the sync points are met, and the emphasis of the movement is present. Even though I felt creative freedom, I re-composed a lot due to the ongoing change of the video cut. These re-compositions for various work-in-progress video drafts discouraged me creatively because of the amount of time spent on music composition and the fact that the change of the video edit did not reflect the feedback on my music but rather the artistic choice of Omari. This experience taught me not to spend too much time on work-in-progress compositional sketches until the final video edit.

Our collaboration with Omari Carter on *Moving Away* was as a series of conceptual conversations, where we established the musical preferences of the overall concept,

engagement via emails, messages, and in-person meetings, until the completion of the project. Through this experience, I saw the aspect of the screendance editing process from start to finish. I learned how to negotiate/compromise my compositional voice in a way that the director would like it. I learned how to use these limitations to achieve my creative ideas. I learned that collaboration is a process, and every step of this collaboration can affect the result.

The process:

The stories behind *Moving Away* documentaries are to give an insight into the lives of dancers who perform around the world and away from home. Each dancer was given a task to improvise in a city, reacting to the world around them, while listeners gain further knowledge of their personal experiences through interviews about moving away from home. My main compositional aim was to explore movement on a larger (designing underscore cues in a linear way for the narrative) and smaller scale (emphasise audiovisual connection through synchronising the gesture with SFX). Omari Carter was responsible for filming and video editing.

Before the start of the compositional process, I had several meetings with Omari Carter, who had already filmed and edited the first drafts of the videos. These videos had no music, only monologues of the interviews. At these conceptual meetings, we discussed musical preferences in terms of style and instrumentation. My sound choices were restricted by the stated preferences of the dancers and the director: piano and electronic beat-driven music. Apart from such general directions, I had full compositional freedom.

Through the work with the visual material, I explored compositional possibilities in composing for the filmed dance gestures and the editing of the videos. In the episode with Simon Watts, I faced the challenge of working with tap-dance improvisational solos: finding the right tempo and metre. I made creative use of the original sounds of the dancer's footsteps,

mixing and combining these sounds with the beat work of the underscore; the manipulation of it created audible polyrhythmic elements. (*Figure 15*)

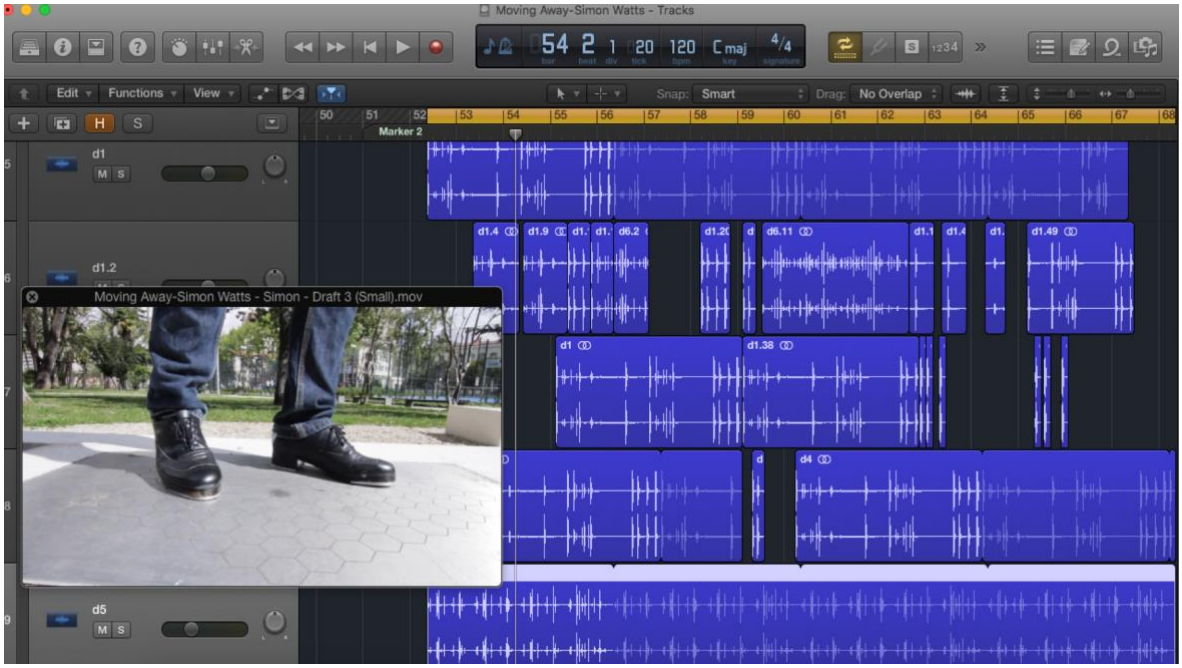

Figure 15. Audio adjustment of the drum loop for the footsteps (1':43'' – 2':17'')

Composing music for *Moving Away* taught me to collaborate with the film director. Through these screendance practices, I had the opportunity to collaborate and write suitable musical cues to a fixed media – video, emphasising movement with specific instrumental parts of SFX to achieve my creative outcomes.

VR Circuit

To gain experience composing music for VR, I approached people from the ARM software development company (Cambridge, UK). At a time, the company was working on their virtual reality application, *VR Circuit*, and they were looking for a composer. I agreed to participate in the project as a composer and SFX maker voluntarily to learn and gain experience.

This project was exciting to me because this was my first experience with a large company, where I collaborated with a team of game developers on a mobile VR project.

Through this project, I learned how music in VR works in practice, to work to strict deadlines, collaborate on a professional basis, and understand the requirements of the project brief—while guiding game developers on how and where in the media space to integrate my music. I learned to direct the game development team musically.

The *VR Circuit* application itself did not have musical layers. Instead, the development team requested that musical cues be attached to the media content. Through this project, I learned how to integrate musical cues in the VR medium; collaborate with a large team of developers to find mutual understanding with non-musicians on sound aesthetics. I learned how to speak and reach a consensus while executing the project. I saw the overall production process from start to end. I explored the VR medium, and I was inspired to further create my own compositions for the VR environments.

VR Circuit was created by ARM Ltd. (Cambridge) as a demonstration application of the circuit visual graphics for the Samsung Galaxy7 phone. When the development team commissioned me to compose music, they already had a playable game prototype. They had a very clear vision of the concept and its aesthetics. My role was to compose the music and create sound effects and voice over to enhance the user experience.

The work on the project was very strictly defined, and I did not get much compositional freedom in my musical expression. However, through this project, I have gained the technical skills of working in VR and added the dimension of VR space to movement. 3D sound and its practical application. I have also learned to collaborate better, to deliver a product strictly to the given brief, and to work with ongoing critical feedback from the development team until the audio elements are approved. These skills helped me design and develop the *Plasticity* piece.

Thing-in-Itself

The *Thing-in-Itself* is the project where I collaborated as a composer with the game developer/director, Arseniy Klishin. I also explored the technological affordances of creating music for a desktop game.

Before approaching music composition, I was speaking with the developer about his stylistic expectations and which kind of music he wants to have in the game. It was important to select instrumentation upfront (which timbres to use/avoid, which genre to use, etc.). When the stylistic selection was agreed, I started to compose.

Apart from the instrumentation and style, I had complete creative musical freedom. I learned to compose music for the narrative-driven game environment. The game developer had already created the storyline for the game. The game's narrative was a framework for my composition. The game has few linear cues and few vertical layers (loops) of composition. These cues which composed to support the game's narrative. When I approached this project, the game's prototype was close to completion. Due to this aspect, the game's narrative and technical built design determined the musical structure.

The game is an interactive story about a young couple, Ted, and Molly, who struggle to understand each other. Using Immanuel Kant's concept of thing-in-itself and perceiving objects as they are, without personal observation[121], as a framework, it leads the player through stages of a relationship, exploring difficulties in mutual understanding arising due to different perception of the world. The actual characters cannot be seen in the animation, but we can hear them through the voice-over narrative and project the narrative onto ourselves. With an average walkthrough time of 15 minutes, *Thing-in-Itself* is not, in a sense, a traditional game: one cannot win it, and it does not present competitive challenges to the player.

[121]Rikizo Nakajima, *Kant's Doctrine of the 'Thing-in-Itself'*, (New Haven, Conn.: Price, Lee & Adkins, 1889).

For this score, I focused on underscore creation and its dynamics in the interactive storyline. This game introduced narrative progression and development alongside movement. Instrumentation includes acoustic guitar, electric guitar, bass guitar, piano, ambient textures, and strings. Tempo and harmonic and aesthetic preferences were discussed with the developer beforehand. The collaborative dynamics between the developer and myself were positive and straightforward. Arseniy Klishin has a clear vision and planned instructions for the project in a way that we both knew what to expect, and the necessary details were discussed upfront. Because of the transparency of the collaborative plan, trust and mutual understanding we did not experience conflicts.

The Tension

The musical underscore for this game is a set of miniature pieces designed and composed according to the game mechanics. During the pre-production stage, the developer and I had conceptual conversations on the sound and stylistic preferences for the game. Considering the title of the game and the gameplay narrative, the developer expressed sound preferences for horror music, ambience atmospheric textures, piano, and scary and tense dynamics, which can create tension in the gameplay experience. The selection of sounds, textures and horror music influences were established in the creative conversations with the game developer, rather than any musical references. The developer would tell me what kind of mood and sound he was looking for, I would then write musical sketches and then, depending on the developer's feedback, complete the composition. Yigit Tiptilnar, the game developer, was mostly always happy with the first sketches of my music. This could be because I met his aesthetic expectations, or because he did not have a specific vision for the game's sound.

Some of the media content was designed to be experienced in a linear way, for example, the 'Start-up' screen (*Figure 16*), 'Choose a Level' screen (*Figure 17*), and 'The Trailer' (*Figure 18*). The reason for this compositional choice is the short length of the media content

as well as the user experience: it needs to introduce the player to the game. ‘The Trailer’ video explains the story of the game via voice-over speech. The musical composition for the trailer video is an underscore to the voice over speech, rather than the emphasis of the moving image. Musical sounds were chosen accordingly to the game aesthetics: ambient texture, the piano, digitally produced orchestral instruments, such as strings, percussion, and brass, using MIDI instruments.

Figure 16. The Tension. 'Start-up' screen

Figure 17. The Tension. 'Select a Level' screen

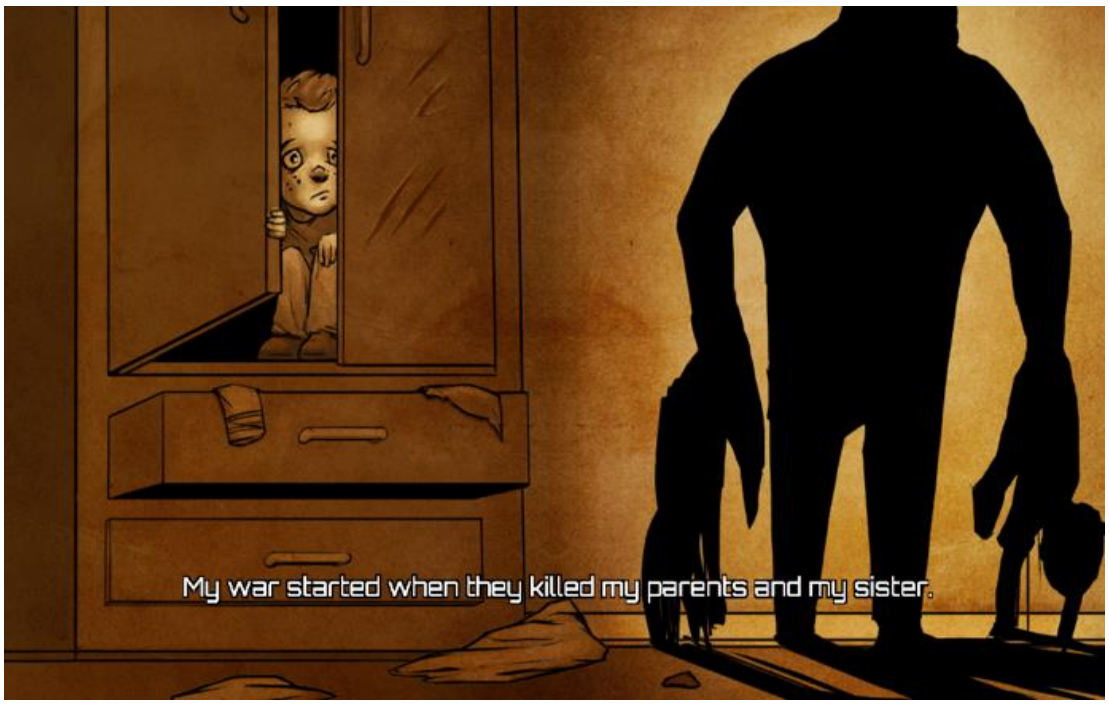

Figure 18. The Tension. The Trailer

Some of the levels were tutorials: they teach the player how to operate within the game and get them used to the game environment. For example, Level 1 teaches the player how to collect the ‘key’; Level 4 teaches them how to engage and solve puzzles with the mirror. These levels

did not require much musical interaction due to the level built and the low stakes. Because of that, the use of underscore layers is limited.

Some of the levels of the game (Levels 2–10) contain musical underscore, which was designed using the technique of layering instrumental stems (*Figures 19* and *20*). Musical triggers, which activate additional layers, are attached to the media objects slightly differently in every level, depending on the requirements of each level. These interactive objects can be boxes, doors, collecting keys, and others[122].

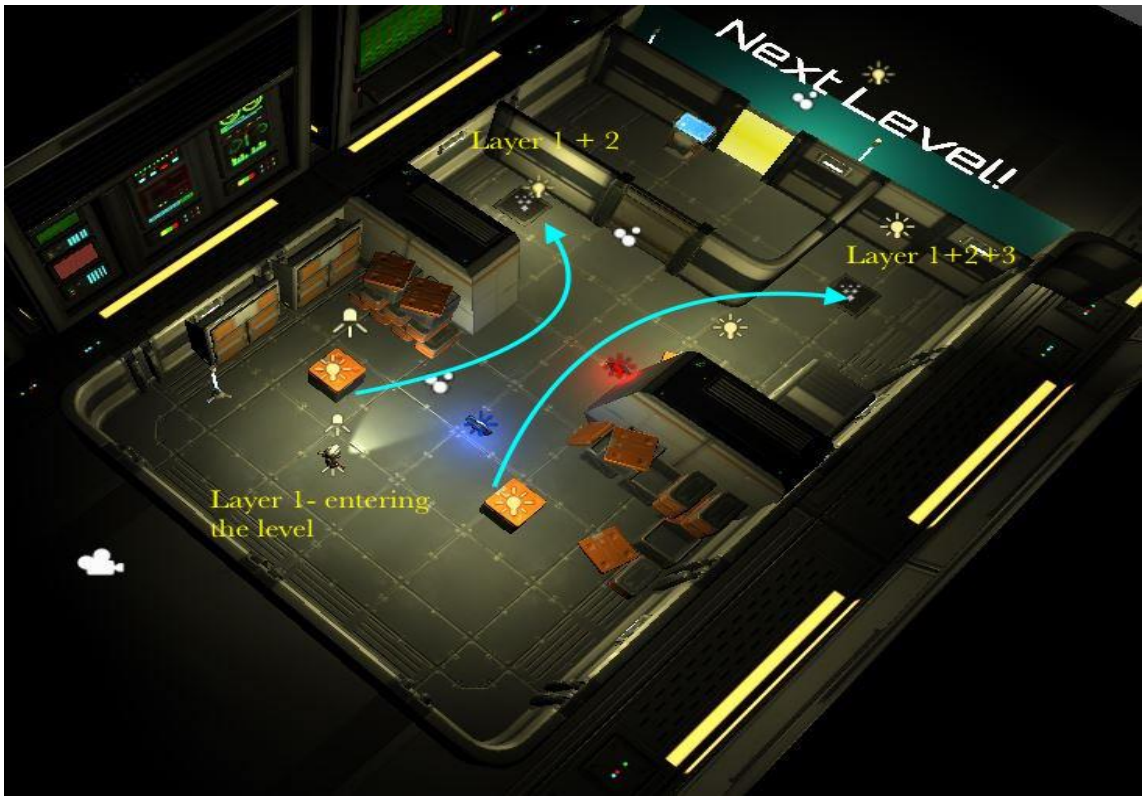

Figure 19. The Tension. Level 2

[122] Winifred Phillips, *A Composer's Guide to Game Music* (Cambridge, MA: MIT Press, 2014), 256–230.

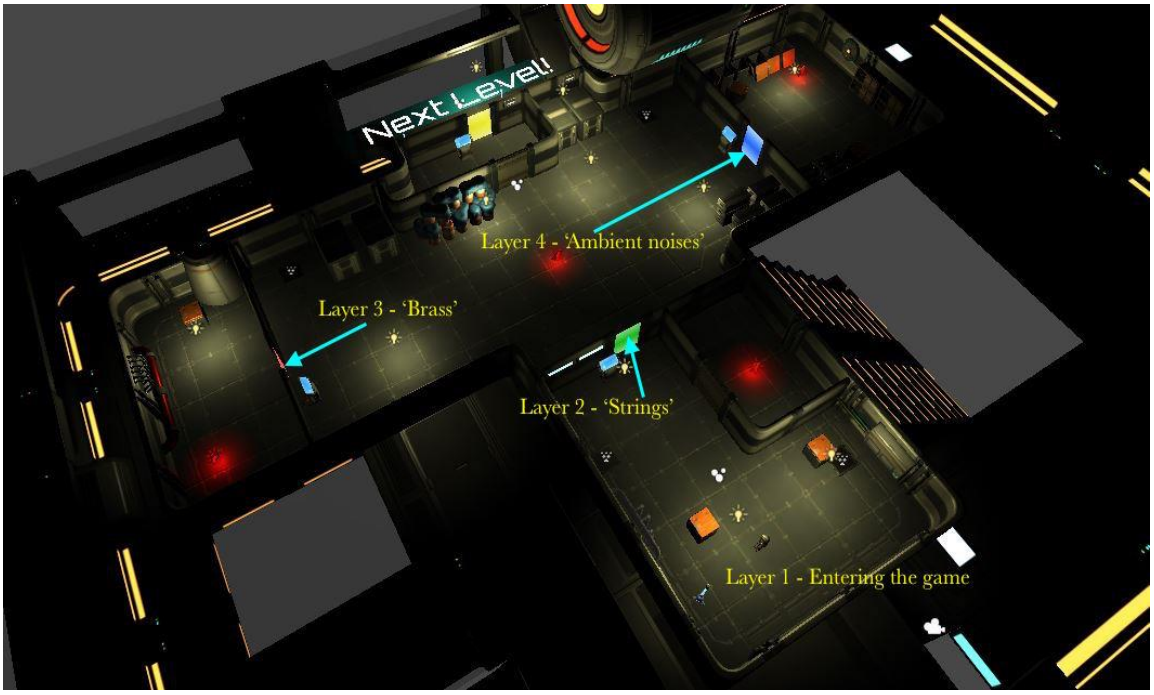

Figure 20. The Tension. Level 3

From level 7, new characters are introduced: the enemies and the security cameras (*Figure 21*). The player needs to avoid the light beam of the enemies and the security cameras. If the player is caught by the light beam of the zombies or by the security cameras, additional musical segment activates, which indicates the danger, and signals that the player needs to run away, or otherwise they will be dead.

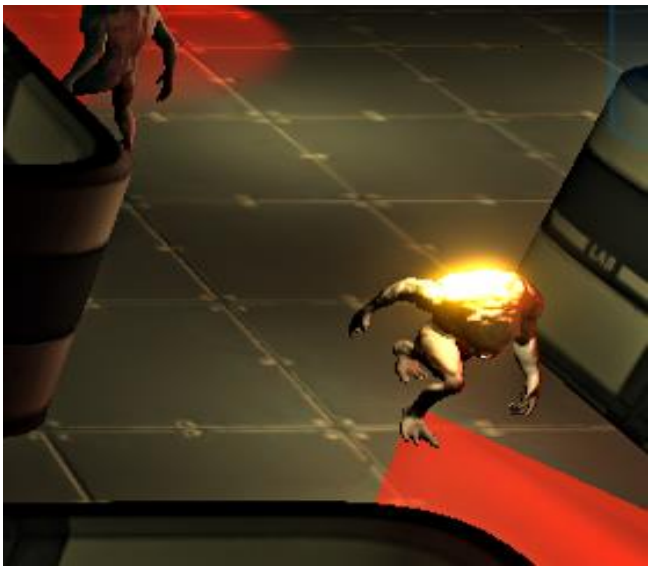

Figure 21. The Tension. Enemies

The collaboration with this game developer went quickly and smoothly because when I was working on the music, I had compositional freedom to make music. I composed musical material which, in my opinion, would suit the game's environment: primarily minor key signatures, quiet ambience, futuristic sound textures as a representation of a scared boy in a big spaceship full of zombies, the use of dissonance harmonies and melodies and raising tempo when the enemies are appearing as a representation of fear. Musically, I was playing with the idea of musical cues and layers and how the musical development creates movement of gameplay.

While these pieces do not deal explicitly with dance, which is a central theme of my research practice, they served as a necessary preparation to be able to interrogate screendance in interactive media. If I had not been involved in working on the *Cube*, *VR Circuit*, *Thing-in-Itself* and *The Tension* games, further ideas of merging the three media (screendance, games and VR) would not have come to my mind.

Method/Mode 3: Re-Composing music for already made media

Collage

With this project, I wanted to experiment with the visual effects of a statically filmed video shot. The rough video was pre-made choreography to a different composition. Through this piece, I experimented with video editing techniques, which were further emphasised with my music. The video and effects came first. The music was composed afterwards. I wanted to experiment with the movement of the editing techniques.

With this screendance piece, I play with the idea of audiovisual collage and montage. My compositional aims were to experiment with synchronised audiovisual elements and explore the movement through a montage of the moving image and the dance gestures.

The dancers were dancing to their initial piece of music, which I then removed and re-composed my original piece of music to it. This source of improvisation was used in my

compositional process. I created the post-production video edits, and because of that, I oversaw all audiovisual changes. This helped me design the piece as an auteur in a way in which every element is equally important and influences every other element. I used visual effects to emphasise the SFX in music composition. Video edits and their movement — as a driving source of musical development. Through this project, I learned how to adjust the movement of video editing in a musical way, which will fit the choreography as well as the overall musical composition.

Stay

In 2017, dancer, choreographer, and actor Jared Garfield, who at that time worked on a screendance duet with dancer Kloe Dean, approached me with a request to compose for his *Stay* project.

The dancers initially rehearsed and filmed the screendance video to Radiohead's song *Reckoner*[123]. However, after the filming was completed and edited, they attempted to clear the musical copyrights with Radiohead before uploading it on the web. The clearance fee was very expensive, and the dancers decided not to use this song and instead approached me, as a composer, to write new music. I happily agreed, and we began to work.

The fact that the choreography and the video have been completed posed a creative musical challenge for me: how not to fall under the influence of the Radiohead's song and how to use this piece to further my research. The idea of the choreography was to show emotional insight into abusive relationships and domestic violence. After an email exchange, we managed to identify the appropriate genre and instrumentation for this piece. Jared sent me some of the

[123] Jonny Greenwood, Ed O'Brien, Philip Selway, and Thom Yorke., *Reckoner*, by *Radiohead*, recorded 2007, Nigel Godrich, released in 2008.

musical/video examples that he liked (Yaman Okur[124]), and that I could use as a reference and stylistic starting point.

Based on these examples, I identified appropriate instrumentation which could fit the vision of my collaborator. My decision was to focus on ambient textures, piano, electronic piano, and slow drumbeat. The tempo must be the same as in the Radiohead song. The feedback from the dancer was that the music should be slow in tempo and more theatrical, with hypertrophic emotions or poetic, as, for instance, in Hans Zimmer's film scores.

The collaborative process was not easy for me, as I had to edit my music all the time and in the only way the film director wanted it to be. I felt a bit frustrated with the commentaries and the feedback because, as the dancers had practised with the Radiohead's composition, their dance movement was very connected to that melody, and they wanted something similar, which wasn't possible. No matter what I composed, they would not be happy with the result. At some point, I just refused to produce another draft, and we agreed on that last version. The musical expectations of the dancers were the major challenge working on the project.

On the first few musical demos, when I was choosing ambient textures, the film director decided that the composition needed a cello. I created the cello score as a starting point, which was recorded by a cellist. The musical structure and the structure of the film cut was designed around the Radiohead track, cues, and sync points.

Through this composition, we successfully achieved our goal. However, by the end of our collaboration, I could not make any more changes, and I decided to stop following the feedback from the director and the dancers. I assume that no one of us was entirely happy with the project. The dancers were used to the Radiohead composition and weren't ready for

[124] Emilie Capel, 'Ziyan Yaman Okur/Emilie Capel (Insightful Music)', April 21, 2014, accessed August 25, 2022,https://www.youtube.com/watchv=bUGMtBnzjTQ&feature=youtu.be&list=PLlXz6_aAG33QLaM7WfAGWVpbea_mn9vm8.

anything different. I did not enjoy the process because I found that this was not a very creative approach to collaboration and screendance creation in general, as I was framed by what they were looking for and did not have much chance to engage with motion and synchronisation to the extent that I was looking for.

Method/ Mode 4: Screendance composition by design

'I call architecture frozen music'.

- Johann Wolfgang von Goethe

The conceptual design of media, as architecture, inspires me to compose music in these frameworks. Working with people, I found it challenging to look for participants constantly. Because it can be time-consuming, the personalities might not go along with the process. These professional relationships might not go the way I would expect. Due to all these reasons, I started to look for participants', pre-plan the design of screendance pieces before composing.

I approached Omari to help me out with this project realisation. He knows a lot of dancers, filmmakers, and people from the creative industry. We had a meeting where I asked him to help me find the collaborators for *Anxiety*, *Dividuals*, and *Plasticity* pieces. Omari helped me find collaborators, and from that point, his involvement started to diminish. Our creative partnership started to decline. We learned from each other, and we began to feel ourselves too familiar with our ways of working — this affected our creativity and the need to move on. Nevertheless, we completed several projects together until we decided not to work with each other further.

In Angst

While working on *Moving Away*, Omari Carter directed, choreographed, and edited videos. However, from with our further collaboration I started to gain more involvement in directing the projects and the technical aspects. I was thinking about further concepts for the pieces and decided to start from my storyline and explore my ideas in this screendance piece. The reason why I changed the mode of our collaboration and became more involved with directing the pieces is because I wanted to execute my creative ideas for my research, rather than following Omari's compositional guidance. Omari was directing the filming process and the choreography; however, the director of this project was me, as these were my creative ideas and the entire input.

The piece allows the audience to gain an insight into creative anxiety through dance on screen. Before the filming process, I pre-composed musical parts that can correspond to the physical/emotional states caused by anxieties:[125] breathless, calm-down, panic attack, and pressure. These elements were discussed in collaboration with the dancer and the film director during our rehearsals (*Figure 22*). During the filming process, we filmed these parts in accordance with the musical elements (*Figure 23*). Unexpectedly, during the filming of the final scene, the microphone caught feedback, and the last recording was almost unlistenable. However, I used this 'bad' recording creatively — expressing the anxiety of the dancer in the final scene of the video. In the post-production stage, Omari was editing the piece, however, under my instructions. After the final video edit was present, I finalised my musical composition.

Being the director of this project, I realised that I could organise people very well and direct them with my creative ideas: collaboration, negotiation, creativity, and the outcome.

[125] Micah Abraham, 'The 6 Main Types of Anxiety — Which Do You Have?', accessed August 25, 2022, Calm Clinic, last updated October 10, 2020, https://www.calmclinic.com/anxiety-guide/main-types.

Being a director made me realise how to manage projects with other people, whereas before, I was making music by myself. I never aimed to be a director; however, the lack of exciting projects forced me to create the projects myself, the ones I would like to work on.

From that experience, I learned to use creative concepts as a starting point in approaching music composition. Mistakes can be re-contextualised and applied in the piece creatively.

Figure 22. In Angst. Rehearsal process.

Figure 23. In Angst. Filming process.

Dividuals

This piece explores the idea of humans as individuals (or dividual), as a part of society. The piece was created under the influence of a piece of writing by Gilles Deleuze *Postscript on the Societies of Control*[126], in where Deleuze created the term 'dividual' to explain the mechanisms of a 'control society', which he opposes to Foucault's 'disciplinary society'[127] (a stage he says we have left). The basic premise is that the term individual means indivisible, the smallest unit in which society can be reduced to. Perhaps people are not completely self-contained 'units' anymore but maybe broken down (divided) even further. 'Dividual' is a physically embodied human subject that is endlessly divisible and reducible to data representations via the modern technologies of control, like computer-based systems.

With this project, my level of involvement was as a director, concept creator, and filming assistant. Omari and I arranged a filming day with the group of students at the London Metropolitan University. Omari pre-planned some choreographic exercises to work on with the dancers. Afterwards, we started to film short pieces of the dancers' improvisation. The dancers' technical abilities were very limited, and during the video edit stage, we decided to focus more on the cut itself rather than choreography. To create choreography through the video cut to mask the technical details of the dancers' abilities.

Omari and I decided to film extra scenes, such as London views, and to edit these videos with the dance videos. We played with video edit as with cells, slowing down, speeding up the tempo, applying visual effects and mixing the video material together. I was thinking about editing in a musical sense, I was experimenting with various editing settings to find interesting movements the moving image. When we got a suitable result, I took the latest video footage and revised the composition again. My aim was to focus on audiovisual sync points. The

[126] Gilles Deleuze, 'Postscript on the Societies of Control', *October* 59 (1992): 3—7.
[127] Michael Foucault, *Discipline and Punish: The Birth of the Prison*, (New York: Vintage, 1979).

inspiration for my approach with this track came from the music video of Bonobo *Bambro Koyo Ganda* (feat. Innov Gnawa)[128].

Through this composition, I have learned to program complex drum patterns, which could be referred to as being in a two-step drum 'n' bass genre. I concentrated on the movement of audio-visual synchronisation and played with the idea of perception and expectation. By this, I mean the musical and sonic emphasis of the visual sync points. Through this project I learned that the movement of the video cut can improve the perception of the actual raw footage and provide an additional inspiration for music-making.

I See You

This project aimed to see which dance movements dancers would create to my pre-composed musical ideas. As a composer for this project, when looking for collaborators, I approached Omari Carter to create the video for this piece, and we started to plan collaborators/concepts/music/etc.

This piece explores themes of identity and equality within gender and race. It questions how a person's perception of themselves can be influenced by others and how humans, no matter what racial or gender identity, connect with other people. We do not always realise that other people can see us as a sequence of social stereotypes and that we often do not have the power to control how we present ourselves to others. This piece explores the stripping away of labels and stereotypes that may be placed upon us. In this film, these labels are represented by coloured paint and large, coloured, faceless heads made of papier-mâché, which were then painted the same colour as the paint on each dancer's arm.

My research aim for the composition was to create a piece of music prior to the choreography. Using this method, I can explore how the dancers will react to the given music

[128] Bonobo, 'Bonobo: Bambro Koyo Ganda (feat. Innov Gnawa) (Official Video)', April 27, 2017, https://www.youtube.com/watch?v=ArWQWAUoiSU.

through their movement and how they will respond to/emphasise rhythmical synchronisation. Each section was rehearsed by the dancers, filmed, and managed for the video editing (*Figure 24*).

Figure 24. I See You. Filming process.

I wanted to use contrasting sounds hence my choice of musical instrumentation: drum patterns, synthesised basslines, which stylistically could be loosely categorised as a dub-step genre, are supported with its opposite – the string ensemble timbres, pads, vocal samples. The piece was written under influences of Lindsey Stirling, *Crystallize* — the juxtaposition and fusion of the dub-step genre are paired with the opposing tones of the string ensemble.

The piece was composed prior to the choreography, and its original structure was as follows: Introduction, A, B, A1, and Coda. However, after the film shoot, the video director decided to switch compositional parts to suit the logical visual development for the film's visual needs. The parts were switched for B, A, Coda, Introduction (credits). Synchronised choreographic, video edit, rhythmic and music elements emphasised the movement connection, especially in parts A and B.

Structure/ cue	B	A	Silence	Coda	Introduction (credits)
Time	0': 08''-1':02''	1':03''-1':33''		1':44''-2':36''	2':37''- 3':12''
Sync points, SFX	0':49''; 1':02''	1':05''; 1':07''; 1':08''; 1':29''	1':40'' (breath)		

Table 2. I See You, structure.

In terms of collaboration, I was not entirely satisfied with some of the creative choices that the director made during the process. This included the choice of costumes, papier-mâché heads and the colours. The director had ultimate control of these details. I felt he overstepped my creative intentions when he swapped the structural elements of the composition round, and the piece took a different life from what I had envisioned. I realised that our creative partnership had come to a close. I did not want to get into an argument and agreed with Omari. It was a lesson learned that in the future, I wanted to work with other artists as an equal collaborator and be involved in the decision-making of the production and postproduction stage.

The main challenge during the project was directing and following creative ideas between myself and Omari. Omari and I have a very different and specific vision of how this piece should look. I learned from this piece that to be fully satisfied with the final output, I need to control the video cut to satisfy my creative ideas fully.

Music composition for media is an interdisciplinary collaborative process, where every element and collaborative input influences and affects the final product. The projects' time frame and set deadlines can also affect the quality and form of the final products.

The ways to approach composition can vary, depending on the project: musical structure vs media structure. For example, in *Moving Away*, episode 4 with Anna Clifford or the game *Thing-in-Itself*, the media was produced first, and the music was composed after, for the media. The media here dictates the way the music is structured. With this approach, composers can face creative challenges in the form of limiting factors, such as the tempo of the edit, or the predetermined length of the piece or a scene. Another example is *Dividuals*, where

the music was composed first, and the video cut was tied to the music. With this approach, a composer can feel freer during the creative process, but the choreographers/video editors will have to match the music in terms of structure, length, and tempo. Another option synthesising the above is when collaborators work with drafts or unfinished pieces of musical and media materials. In this way, composers and video editors have more creative freedom, as they can add additional parts, extend the length, cut something out, etc. With this approach of 'composing with the media', every collaborator will contribute to the final product. An example of this collaborative method is *In Angst*. Here, some parts of musical elements were pre-composed before shooting for the reason of tempo matching. Then the film was shot and edited, and, after the exchange of files back and forth between the collaborators, the music and the video were worked on in a post-production stage until everyone was happy with the final product.

Video game composers are often required to work with a team of people. Depending on the project, the number of collaborators may vary from collaboration with one audio director up to multiple collaborations with developers, writers, audio production and postproduction engineers, software coders, animators, and others. At the beginning of the collaborative process, the game might not be fully conceptualised. The playable game prototype could be the first version of a concept. The form, function and style of the musical soundtrack are designed and composed according to all possible storyline directions, which have been agreed with the team members.

In commercial contexts, composers cannot always have free reign to make aesthetic decisions; they must follow a brief. A defining part of this workflow is that the developers supply composers with a specific aesthetic vision and narrative structure for the game. It is vital to consult with and agree with the developers on what kinds of sound they are looking for to successfully establish and support the aesthetics of the game. How do they perceive the

game? What are their expectations and preferences?

The starting point for conceptual conversations around game sound and music aesthetics often takes the form of a compiled musical style guide, which identifies preferred instrumentation and style references, and gives clues to the desired mood of gameplay. In this pre-compositional process, it is also useful to ask the developers to provide images or screenshots of gameplay because as soon as there is an image, it can speak quite powerfully for itself. Visual aesthetics and modes of interaction can define the game genre and how the game fits among similar games. It allows me to consider how I can balance any genre expectations and constraints due to the traditions I'm working in against my own creative response to the visual and narrative stimuli.

Another starting point involves finding out my collaborator's personal musical preferences. What is their favourite music? What are they listening to? For example, for my produced score for the game *Thing-in-Itself*[129], in our conceptual conversations, we discussed general plot and idea of the piece, selecting the dynamics and tempo. Arseniy Klishin, the video game developer, gave me musical examples from other artists which he was listening to, which in his opinion matched the 'mood' of the game. From these examples, we then negotiated, agreed, and collaboratively defined the instrumentation and style boundaries of the work, which are stated below.

I was sent screenshots of the game (*Figure 25* and *26*) and I started to compose the musical cues.

[129] 'Thing-in-Itself', accessed August 24, 2022, https://partyforintroverts.com/thing-in-itself/#more-3.

Figure 25. Screenshot 1 from the developer

Figure 26. Screenshot 2 from the developer

As a composer for hire, I am happy to operate in any style that I can successfully execute – following the stylistic guidance from a project director, while remaining true to my 'creative voice' in these contexts is not my priority. Because the communicative aims of my music need to be accessible to a wider audience, it is the assumed expectations of this specific audience that inform my choices in composition, such as instrumentation, timbre, stylistic consideration, and sound design. While the commercial composition is interesting to practice research for considering collaborative creativities and the processes of creativity within limitations, the research focus here is primarily concerned with how my music reacts to, moves with, and inspires movement in these game environments.

In my creative practice, I build an audiovisual dialogue with cinematic underscore and SFX by firstly analysing the media: mood, structure, and dramaturgy. Then I plan out harmonic functions and account for stylistic expectations[130], which will respond or correspond to the emotive story of the moving image. Alternatively, future composition could start with a collaborative interdisciplinary plan between dancers or video game developers.

This chapter demonstrated that various modes of collaboration could be used as creative methods. Using different contextual situations helped me explore the input of collaborative

[130] Diana Deutsch, *The Psychology of Music*, 3rd ed. (Amsterdam: Elsevier, 2013).

practice on the generation of musical ideas, development/negotiation of personal musical voice, the process, and the results. Comparing differences in approaches to collaboration in screendance, games and VR media.

By exploring the modes of collaboration, I became an interdisciplinary composer. I gained the necessary understanding of the different disciplines — all of these allowed me to generate different ideas; these ideas shaped my voice and expanded my compositional practices to interdisciplinarity.

To finalise this chapter, I want to summarise the explored research questions:

- How does collaborative practice shape the outcome of an audiovisual composition? This happens by the process of generation of creative ideas through concepts, improvisation, contextual situations and individual skills of collaborators; by the improvisational material itself, and its length; by the flow of production and post-production activities.
- How do modes of collaboration affect the development of the finished composition? Working on different modes of collaboration expects compliance with the project's needs. The project's auteur/director guides the aesthetic, commercial or academic output. The role of collaborators is to create in the framework of the project's needs, which consequently affect the development of the finalised composition.
- How does collaborative communication affect the development/negotiation of personal voice? Collaborative communication can influence participants to generate new creative ideas, which then affect the development and negotiation a personal creative voice.

Chapter 3: Work with Technologies

This chapter explains the practical process of my compositional involvement with media technologies. Through the portfolio examples presented in this chapter, I will explain the functional adaptation of my approach to movement to screendance videos, games, and VR media. Through *Plasticity* and *Journey Through EDM Environments*, I summarise my creative insights of merging screendance, games and VR into one interdisciplinary medium – integrating interactive music techniques into screendance, with the aim of providing a 'gamified' artwork/form of screendance; exploring the EDM's relationship to screendance and integrating it in an aesthetically creative way; expanding my compositional field through interdisciplinarity.

Working with screendance, games, and VR requires knowledge of a range of technological tools: software, hardware, and middleware; understanding console and device specifications, audio and video formats, and the use of technology to effectively collaborate and share digital materials. These technological tools provide affordances and limitations.

To compose and produce music, I use Logic Pro X[131] digital audio workstation (DAW). If I need to score a specific instrumental part for the instrumentalists, I use the digital notating software MuseScore[132]. Working with DAWs and composing music with MIDI using virtual instruments allows me to produce music on my own, reduce the number of collaborators due to time limits, without necessarily relying on other musicians – rather than hire a percussionist or drummer, I can program my own beats. However, working collaboratively with other musicians can provide inspiration and influence the final product (as in the cello recording for

[131] 'Logic Pro | Ridiculously Powerful. Seriously Creative', accessed August 24, 2022, https://www.apple.com/uk/logic-pro/.
[132] 'Create, Play and Print Beautiful Sheet Music: The World's Most Popular Notation Software', accessed August 24, 2022, https://musescore.org/en.

Stay by Kate Shortt).

When the music (soundscape) and SFXs have been produced, all the audio files must be implemented into the media. I write music then I manipulate the audio files for their technical application to the media. Essentially, the production is happening with the integration of the audio files. The audio integration tools for screendance will be cinematographic post-production software, such as Final Cut Pro[133], Adobe Premiere[134] or similar. For interactive audio implementation (games and VR), the tools will be different, depending on the level of complexity of the media. For complex video games, middleware can be used, such as Wwise[135], where additional sound editing needs to be done. This includes volume balance between the audio files, attaching sounds to interactive objects, applying 3D plugins (if needed), mixing all the elements together and then compressing the final mix, to save space. If the music design for a video game is not complex, then the game development software such as Unity[136] and Unreal Engine[137] can be used for simple audio implementation into the game environment. The middleware option allows the opportunity of adding sound design in the form of signal processing.

Understanding these technological affordances and limitations is important because they can provide composers with unique opportunities for creativity. I was fascinated with finding out the technique of music triggering, because it makes me think about the digital environment as a compositional space, expanding my conceptions of where, in what space, a composition might exist and be interacted with. This knowledge opened to me some new area

[133] 'Final Cut Pro, Storytelling at its Most Powerful', accessed August 31, 2022, https://www.apple.com/uk/final-cut-pro.
[134] 'Adobe Premiere Pro, Video Editing That's Always a Cut Above', accessed August 31, 2022, https://www.adobe.com/uk/products/premiere.html.
[135] 'Wwise, The Most Advanced, Feature-Rich Interactive Audio Solution', accessed August 24, 2022, https://www.audiokinetic.com/en/products/wwise/.
[136] 'The World's Leading Platform for Real-Time Content Creation', accessed August 24, 2022, https://unity.com/.
[137] 'Unreal Engine | The World's Most Open and Advanced Real-Time 3D Creation Tool', accessed August 24, 2022, https://www.unrealengine.com/en-US/.

of experimentation because it allowed me to manipulate the musical 'material' in a different way. The limitation of technological affordances can also provide a framework for experimentations, and it can spot areas for technological and artistic improvement and innovations.

While the above concerns the underscore/background music, sound effects are attached to the movement of characters or interactive items: to something that will always have the same sound(s). Voice Over (VO) is the third sonic element that can be used in games. VO can be included in the digital game space to guide the gameplay when specific game parameters change, and certain actions are performed.

When designing multiple layers for the narrative and variation, it is important to remember that games are created to be played multiple times and that the soundtrack should be musically interesting and diverse, with a sense of musical development. It is also important to remember to compose suitable transitions between the cues.

Paul Hoffert listed different ways of adding musical variations to the instrumental layers/loops through variable tempo, variable pitch, variable rhythm/meter, volume/dynamics, variable DSP/timbres, variable melodies (algorithmic generation), variable harmony (chordal arrangements, key, or mode), variable mixing, variable form (open form), and variable form (branching parameter-based music)[138]. The tempo aspect is important for my screendance compositions. With the choice of BPM, I think about the dancers and how they are going to be dancing to it. If the tempo is very fast, then I am thinking about the choreography in a half-time, or I can choose the slightly slower tempo and create the intensity through different musical elements.

When working with different media contexts/technologies, constructing a composition

[138] Paul Hoffert and Jonathan Feist, *Music for New Media: Composing for Videogames, Websites, Presentations and Other Interactive Media* (Boston, Mass: Berklee Press, 2007).

out of small parts allows me to achieve complexity from the combination. Fixed media musical composition structure is made up of a linear group of cues; in interactive music composition, the structure builds upon one or more vertical/layered blocks of stems. My approach to interactive music creation is based on creating loopable musical instrumental parts that can be combined vertically (vertical re-orchestration), programmed into the game to play out in relation to the narrative movement or a change of environment. Composed 'cells' (cues) for linear and interactive media composition (which creates an illusion of musical development and linear structure with interlocking layering technique) support the visual movement and complement the narrative. Starting a project with a specific concept involves decisions on its technical specifications, affordances and limitations.

Working with screendance technologies:

The modern screendance art-form itself is a video file, which requires involvement with filming technologies (cameras), the artists/dancers, the space/location/filming environment, and the video editing.

> When you start to make a new piece of work, you might not know exactly what the finished work will look or sound like, how long it will be, nor its shape or structure, and that is fine. But what is vital is that you are clear about your intention[139].

The creative process begins by establishing the overall concept/theme/idea for the project. Looking at my portfolio, it is observable that my screendance pieces are not connected in a conceptual way. The portfolio is a set of miniature pieces which have their own narrative/concept/or idea. This is a very common aspect in screendance practices. When working on a screendance piece, the number of collaborators, the time, funding/or lack of

[139] Katrina McPherson, *Making Video Dance*, 2nd ed. (Oxon and New York: Routledge, 2019), 2.

funding, predominant academic environment — all these aspects do not allow a large number of collaborators to sustain a project for a long period of time unless the project is funded. As a self-funded researcher, most of my creative collaborators engaged with the projects on a voluntary basis, and this is why the portfolio pieces are miniatures.

When the theme/story/idea is established, then the process of planning the production begins.

- In order to know how you want to film a particular scene, you need to know how you plan to edit so that you can be sure that you have the shots that you will need.
- In order to devise a production schedule, that is by when particular tasks need to be completed, you need to know if you plan to use improvisation or to choreograph and storyboard everything, as this will have an impact on the amount of time that is set aside for rehearsal.
- Before you even created one step of choreography, you may need to make decisions about what the dancers are going to wear in order to ensure that their costumes are sourced in time for the first day of filming[140].

A screendance piece, as it is a piece on its own requires focus on a specific idea, theme, or a story. Then, from that idea, collaborators decide on how to develop that idea and translate it into the screendance piece using dance and technologies.

During the production process, the practitioners are engaged in working with cameras and their affordances (camera positions, camera movements, close or wide shots, etc.), working with choreography for dance on screen (this can be very specific choreography that will work only on-screen; filming separate elements, that would provide coherence after the editing); engagement with the location/environment; collaborating; engagement with light and/or sound. During the post-production process, the screendance practitioners are engaging with the editing and adjustments of the audiovisual elements.

[140] Katrina McPherson, *Making Video Dance*, 2nd ed. (Oxon and New York: Routledge, 2019), 15.

Working with game technologies:

Cube

Cube is the exploratory piece that allowed me to engage and learn game affordances from the technological point of view: experimenting with pre-composed audio files and integrating them into the game using Wwise. Before approaching this project, I started to research music interactivity in games. I was specifically interested in its technicalities: how to make music interactive and dynamic. I did not have contacts in the game industry or collaborators at that time. Before approaching game developers, I thought it would be practical to research the possibilities of game music myself with pre-existing assets. For that reason, I found the game *Cube,* which is an open-source game for game composers/sound designers to use to learn the technicalities of middleware Wwise. I learned Wwise specifications and how the technical aspects of it work in practice.

This work prompted the idea of composing music for interactive environments, the exploration of the practical and technical issues that come with them. *Cube* score expanded my compositional vision with sequencing/layering approach to the interactive music structures. It was the first piece in which I could explore the possibilities of such an approach.

For this video game, I composed two musical 'cues', 16 bars long each. These 'cues' were deconstructed into instrumental groups and were separately triggered into *Cube* (Table 3). When experiencing gameplay, the player crosses these triggers, which are layered on top of each other, and this musically creates a sense of development.

- Cue 1: Inside location – drum ‘n’ bass genre, as a representation of the emotional intensity of the first-person shooter game (0’:43’’).
- Cue 2: Outside location- ambient textures, as a representation of the location and air space (0’:43’’).

Cue	Cue 1 - layer 1	Cue 1 - full instrumentation	Cue 2
VO	'Welcome to the Cube' 'Well done'	'Welcome to the Cube' 'Well done'	'Be careful there are lots of monsters around'
			

Table 3. Cube, structure.

I applied different reverb for the inside and outside locations (with Wwise), to create realistic specialisation (*Figure 27*). I then attached SFX to the actions in the game (footsteps of the player, jumps, breath, death, etc.; shotguns; sounds for zombies and pick-up items). I created some of the SFX from scratch, the other I borrowed from the library (audiokinetic.com). Using library sound is a very common technique in the game industry, in cases where unusual or difficult to record sounds are required (such as a shotgun sound, etc.).

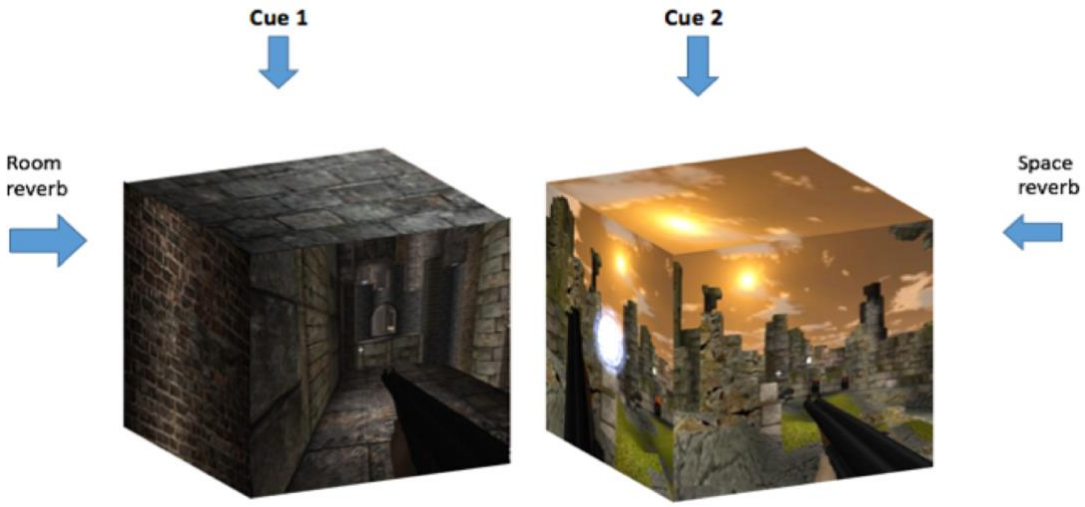

Figure 27. Cube. SFXs attached to the interactive items and the characters' actions; voice over

I recorded my voice with the sentences: 'welcome to the Cube!', 'well done', 'be careful, there are a lot of monsters around', which support the player through the gameplay experience.

I edited audio files in DAW, and then exported them into Wwise. Wwise is then synchronised with the game. When the balance between all the samples in the game was established, I added the script codes to insert appropriate files from Wwise into the game itself.

Through this project I learned that music can be adapted to the game's media environment in a compositional way. Every space of the media environment can be triggered with audio files in a musical way. Instrumental music parts can be deconstructed as layers and integrated creatively for compositional and creative purposes.

Working with VR technologies:

Plasticity

This interdisciplinary piece explores the synthesis of musical/sound elements, screendance, games and VR. The initial idea was to bring all my creative practice insights into one piece. From the compositional point of view, the fusion of these interdisciplinary practices is innovative and novel because I use non-musical parameters (choreography, filming, overall concept design, and technologies) as compositional concerns. Through *Plasticity* (and further with *Journey Through EDM Environments*), I apply the idea of 'transmediality'[141] – transporting the screendance as a fixed media into interactive VR. The compositional approach used in this piece includes using musical loops, layered on top of each other (the play areas one and two), and composing for the silent dance improvisation (introduction, the middle section, and the conclusion).

It demonstrates the use of horizontal resequencing and vertical re-orchestration[142] approach to musical structures. It also shows different compositional possibilities afforded by

[141] Tim Summers, 'Music and Transmediality: The Multi-Media Invasion of *Jeff Wayne's Musical Version of The War of the Worlds*', *Twentieth-Century Music*, 15, no. 2 (2018): 231—258.
[142] Michael Sweet, *Writing Interactive Music for Video Games* (Upper Saddle River, NJ: Addison-Wesley, 2015).

the kinaesthetic empathy, the use of sound effects, which are emphasising gestural and bodily movement, and immersion.

The music was pre-composed upfront to the filming process for play areas one and two. Because I was thinking about the gameplay of interactive elements. However, during the filming process, my collaborators and I decided to play with DSLR cameras as well as with the 360 camera and include the transition sections to combine the interactive areas in an organic way. The screendance filming techniques include the experimentation with regular camera (Sony FS7[143]) footage, stretching them into the 360 virtual environment, as well as the use of 360 camera. The musical material was produced using DAW (*Figure 28*); it was then exported as audio files and implemented to the VR application, using Unity game development software and C++ code (see Table 8).

Introduction	Area 1	Transition	Area 2	Coda
To be played once	To be played on a loop	To be played once		To be played once
filmed with regular camera	filmed with 360º camera	filmed with 360º camera	filmed with 360º camera	filmed with regular camera
	Contains 4 interactive loops (triggers) which can be switched by the played at any time: 1. Percussion 2. Strings melody 3. Piano melody 4. Drums		Contains 5 interactive elements which can be switched by the played at any time: 1. Strings tremolo 2. Bass 3. Kick drum 4. Synths 5. Percussion	

Table 4. Plasticity, structure.

[143] 'Sony, PXW-FS7', accessed August 31, 2022, https://pro.sony/en_GB/products/handheld-camecorders/pxw-fs7.

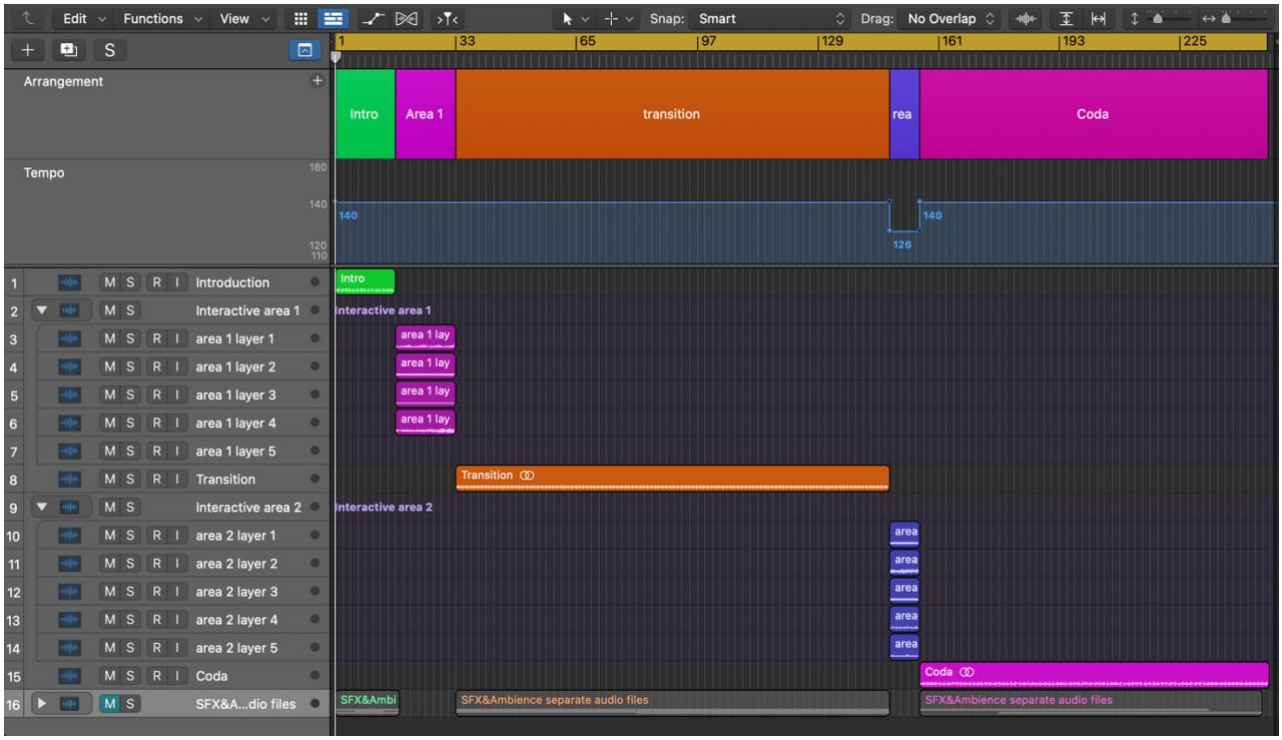

Figure 28. Plasticity, structure. View in Logic Pro X DAW

I decided to direct the project myself to create the media content, create the concept, compose music, collaborate with all the participants, make video edits, and integrate it into VR with the developer. I was fully in charge of the creative choices and the way the project went — this let me put my music and movement concerns at the centre in a way that they had not been with the earlier games.

At the start of the creative process, I sketched the concept, which I explained above. Afterwards, I searched for collaborators — the dancers, the filmmakers, and the VR developer. When the team of collaborators agreed to participate on the project, I was starting to pre-compose music for the dance film improvisation.

To film the videos, I dedicated two days, where the first day would be a rehearsal day, and the second day would be a filming day. On the rehearsal day, I directed the dancer with the general concept of the game and the dancer's purpose in it. I was playing to the dancer my pre-composed musical elements; the dancer improvised and created movements. We were

also working on using a 360 camera during the rehearsal day, how and where to position it in the space, and other filming technicalities. We were confident to execute the project on the filming day because all the nuances were addressed on the rehearsal day.

After filming was done, the filmmaker of the project, Amer Irdis, approached the editing. However, due to his limited availability, I had to finalise the video editing myself. The editing process was also important because these videos would be further implemented in the VR, and I needed to see the footage to further direct the VR game development.

When the video files were edited, I approached the VR developer to implement these into an application. We were working on the game programming together, where I would direct the developer with the concept and the game mechanics, and the developer would follow my guidance.

While working on the video implementation, we were facing the issue of synchronicity of the videos. When playing the game and triggering the triggers, the program had a technical delay in switching videos. The developer mentioned that if the filming was made with the green screen, there would be more technical freedom to work with the dance avatars creatively. However, the filming was already there, and it was too late to re-film the video footage due to my personal circumstances. However, I took that suggestion (filming dancers with a green background) for the next piece – *Journey Through EDM Environments*.

Through this interdisciplinary project, I learned to direct the project from start to finish. Following my creative ideas to find my compositional voice. I was collaborating with dancers, filmmakers, and the developer. I designed and built the media environment to realise my compositional ideas. Even though we had issues with the synchronicity of the videos, this project is important because I brought all the aspects of my research into one medium: screendance, games and VR; movement of dance gestures/bodies, movement of composition

through the game music techniques. I learned to design a media environment for compositional purposes.

Journey Through EDM Environments

The initial idea behind *Journey Through EDM Environments* was to create an interactive screendance VR experience and to improve the technical limitation faced in the *Plasticity* piece. Through this piece, a player will engage with a new game narrative and explore movement/journey through an artificially designed game environment — a nightclub. The game's goals are stated below:

- Creating a gamification experience in screendance.
- The fusion of screendance and game media in a VR game environment.
- Solving the technical limitations of synchronicity of audio-visual loops in the VR medium.
- The creative juxtaposition of contemporary and urban professional dancers in a social dance environment — a nightclub.

This piece summarizes the exploration of my research questions, which are:

- 'How does visual and conceptual ‘movement’ drive/affect the creative process of music for audiovisual composition?'
- 'How can interactive music techniques be effectively integrated into screendance, with the aim of providing a ‘gamefied’ artwork/form of screendance?'
- 'What is EDM’s relationship to screendance, and how might it be integrated in an aesthetically substantial way?'

Through exploration of my research questions, I provide my contribution to knowledge:

- A synthesis of game triggering techniques, VR, screendance, and Electronic Dance Music (EDM).
- I am using 'game' music compositional tools to create musical development (the build-up compositional technique of EDM) through the 'looping/ layering technique' in a triggered digital space (using a dynamic music system).

- I am looking at in-game players' interaction with musical triggers and movement in digital space.
- Synthesising/ combining aesthetics of contemporary dance and electronic dance music in the context of VR space, using game music composition techniques.
- Using game design empty canvas. Demonstrating how digital game space can be designed for music.

Influences and inspirations for this piece came from researching the creative practices of the art duo Ruth Gibson and Bruno Martell and pieces such as *Expanded Fields*[144], *Dazzle*[145], *SwanQuake*[146] and others. Gibson/Martell incorporate elements of screendance, games, moving images, machine learning, live simulation, dance performance capture, installation, and VR in their practices. In pieces such as *Expanded Fields* or *SwanQuake*, the dance represented by motion-captured dance choreography and translated into animated avatars that represent the movements in VR. Sonically, the sounds in these pieces are sound-art soundscapes. Where in *Plasticity* and *Journey Through EDM Environments*, I look at EDM structures, the movement and the media: synthesis of screendance, games and VR. This is my contribution to knowledge.

The Process

It was 2020–2021 when the piece was created. During this time, the UK went into lockdowns several times because of COVID-19. It was essential to complete this project due to my PhD timeline for submission. Before approaching the project, I experienced fears of finding and working with collaborators, finding, and booking the space for collaboration; these caused me emotional, technical, and collaborative challenges.

[144] 'Gibson/Martelli, Expanded Fields', accessed August 31, 2022, https://gibsonmartelli.com/portfolio/expanded-fields/.
[145] 'Gibson/Martelli, Dazzle', accessed August 31, 2022, https://gibsonmartelli.com/portfolio/dazzle/.
[146] 'Gibson/Martelli, SwanQuake', accessed August 31, 2022, https://gibsonmartelli.com/portfolio/swanquake/.

I didn't have much choice when I was looking for dancers — any contemporary and urban dancer who would be willing to participate and collaborate during the lockdown was a good fit for my project, as I had doubts that this would happen at all. I was lucky to find Corinna Abela (contemporary dancer) and Dylan Mayoral Galindo (urban dancer), who agreed to participate in the project. I thought this would be interesting to observe the aesthetic juxtaposition of contemporary and urban dancers in an artificially designed nightclub environment.

I pre-imagined the game design by drawing it on paper. I pre-composed the musical elements (instrumental parts) for filming the dance improvisation and booked the filming location (Royal Holloway, University of London, Department of Media). I filmed the dancers by myself. The dancers were filmed with a green background with the purpose of removing the video background and keeping the dance avatars, which can then be implemented into the game's environment.

Observing the screendance film's and game's production and post-production processes with the previous collaborators gave me an understanding of the overall cycle of this creative practice. Based on that experience, I felt the need to lead the process beyond music composition and express my visual concept as movement in a digital space. While directing the collaboration, I was actively involved in the process: explaining the overall concept, the mood, even dancing myself (when speaking with dancers about musical phraseology, or trying to repeat interesting moves after dancers' improvisation, etc.).

I filmed Corinna Abela, the contemporary dancer, first. The musical sketches were sent to the dancer upfront to rehearse and to come up with suitable movements for the instrumental music parts. When filming Corinna, we experimented with 360 degrees video shoots, as well as fixed video formats, the camera settings, and the camera’s affordances.

I filmed Dylan Mayoral Galindo on different days, directing the process, musical phraseology, length of video loops, and occasionally movements; however, not as much as Corinna's. Interestingly, Corinna and Dylan never met each other, and they did not see each other's movements. This was made for a reason, as I did not want Dylan to see Corinna's movements because it could influence Dylan to make similar gestures instead of expressing his own creative ideas. It was important to me that these two dancers, coming from contemporary and urban dance backgrounds, could insert elements of their dancing styles, and in the game, I can juxtapose them as an example of how these two dancers are reacting to my music.

Because I filmed Corinna and Dylan on different days and experimented with various camera settings, this caused me further technical challenges — the raw footage of Corinna's and Dylan's videos are different in their frame rate/audio sample rate. This technical problem caused further complications with the synchronicity of the audio sample rates of my music and the visual synchronicity of the footage.

After the filming, I began editing the video footage. It took me two months to edit the videos because I needed to see the result myself and pick the best recordings of it, and the process of video editing is time-consuming — due to the file size, video editing software rendering, and other technical complications.

When the videos were edited, I approached Andrej Kowalski, the game programmer, and we started to collaborate. Daily, I was sending Andrej tasks to do for the game; however, we faced problems of communication. The developer felt that he wanted to make a creative input into the game and its visual look, and I wanted him to simply follow my direction, as this is my project. What would happen is that I would send Andrej my instructions; he would re-interpret them as he thinks is right. I would then see the results and would not be happy, as this is not what I wanted, and we would have a conflict. Andrej found it challenging to follow

my auteur's guidance. At some point, I suggested to Andrej that we work together — I would tell him what to do, and he, as a programmer, would do it. This is how the first prototype was created with Unity.

When exporting the project from Unity to a mobile VR, the video loops of the dance avatars would affect game performance. We tried to export it on several mobile phone models and on a desktop computer as an APK application. However, the game froze every time the dance avatars were triggered.

It seemed that there was no solution to this issue, and I nearly gave up on the idea of completing this project. I started to look for more different game programmers. I did not want to collaborate with people I did not know, as this can be risky with the result. I asked Arseniy Klishin, the game developer of *Thing-in-Itself*, to recommend me someone professional. Arseniy recommended me Max Richard Ashton, game programmer from Sony PlayStation VR. We connected with Max, and our collaboration went on a completely different level. I experienced inspiration and professional admiration for Max, as his programming skills and musical understanding were outstanding.

Max recommended I install the game for a more advanced VR headset — Oculus Quest 2. This device is more powerful than a mobile phone for games. Max also mentioned that from a programming point of view, this is very difficult to manage many video files playing simultaneously, and Unity can only proceed with one or two (maximum) videos playing at once. I was speechless as I had lots of edited videos in the game. We decided to re-edit the videos into one (or two files), scaling down the dance avatars and scaling up them in the game. When placing the video into the game, we technically used the same video, where some of its elements will be visible/ or invisible. This was an excellent solution for the videos. (*Figure 29*)

Figure 29. Journey Through EDM Environments. Level 3: Techno (first video)

Journey Through EDM Environments represent a player's walkthrough of a digitally designed nightclub environment. A player enters the game into a corridor-like location and sees five doors: the blue door (for the Chill-Out level), the pink door (for the House level), the purple door (for the Techno level), the orange door (for the Drum ‘n’ Bass level) and the yellow/green door (to Exit the game). Pointing the joystick on a door/trigger transports a player into levels or exiting the game. Playable levels represent EDM musical styles — Ambient/Chill-Out, House, Techno and Drum 'n' Bass. The player can enter any door of preference without a specific need for level's progression.

The entry space has a background sound texture (the quiet sound of the riverbed room itself) playing on a loop. Its purpose is to provide a sense of a corridor ambience. In addition to this, when the player points at the door with a joystick and while a circle is triggering, we can hear a musical preview of a level. (*Figures 30* and *32*)

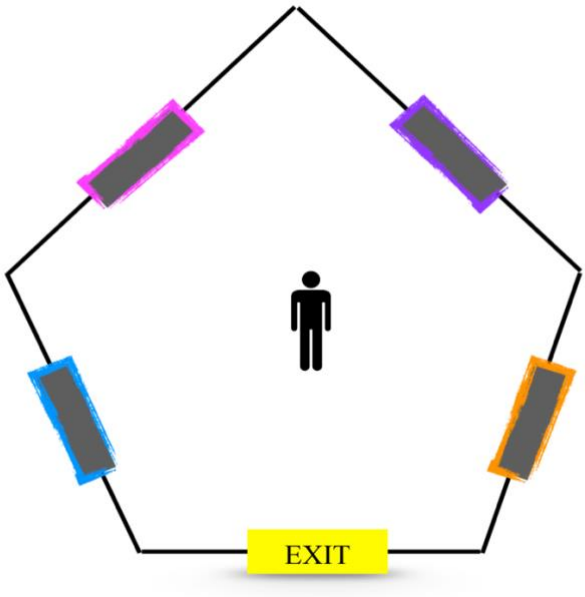

Figure 30. Journey Through EDM Environments. Pre-design of the entry space – 'Corridor'

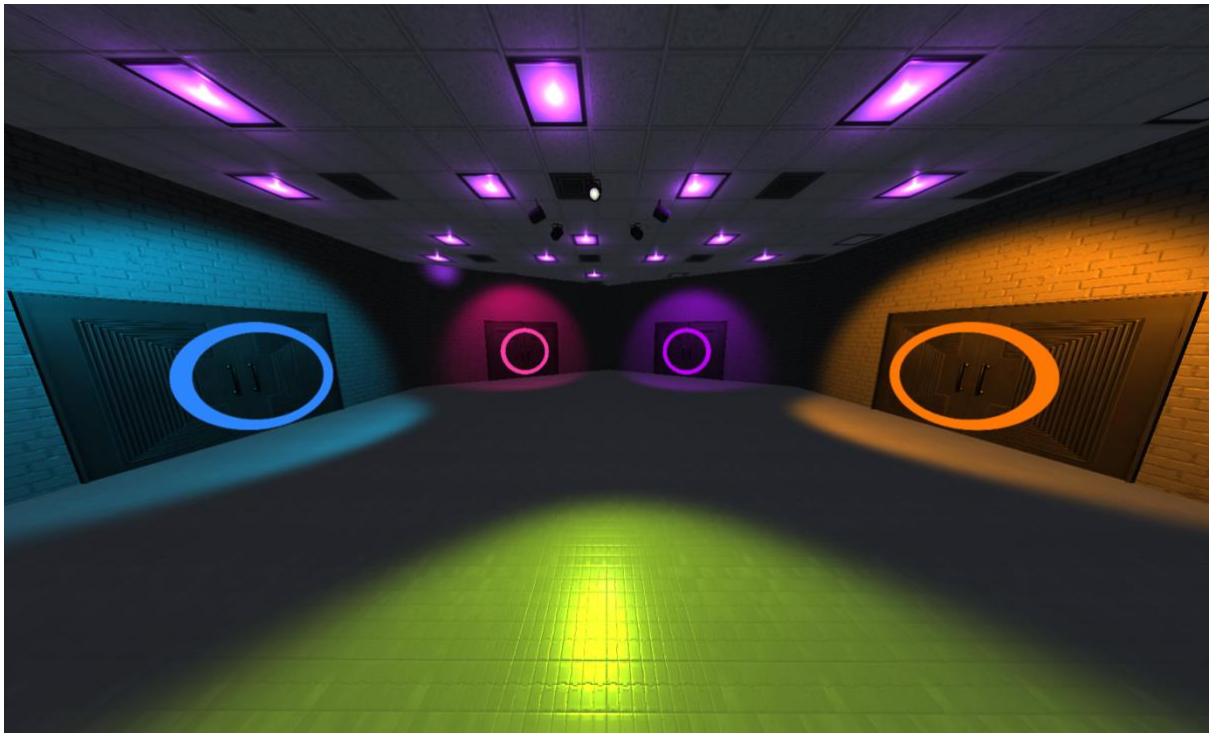

Figure 31. Journey Through EDM Environments. In-game 'Corridor' view

When a player triggers the blue door, it transports them into the 'Ambient/Chill-Out' level. The space itself represents a place for relaxation, as an interpretational version of Chill-

Out rooms in clubs, with sofas, VT, and room-like furniture. This is a place to have a break from loud dance music while still at a club. The interior design came to me only after the filming with the purpose of organic integration of dance avatars without making them dance on a dancefloor. Instead, the dancers are appearing on the TV screen if the circles are triggered by a player. (*Figures 32* and *33*)

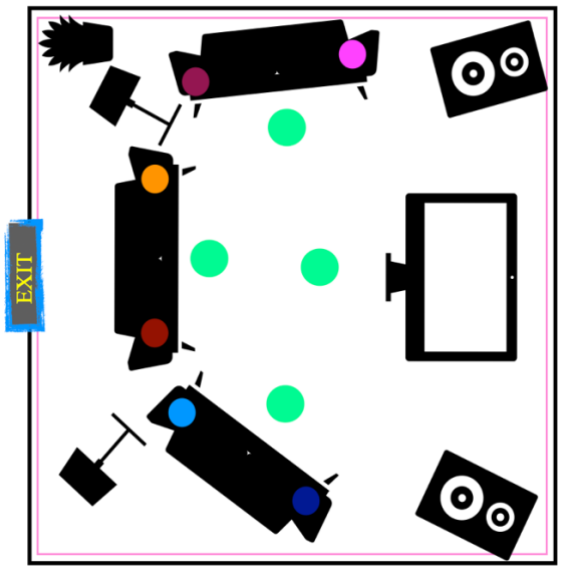

Figure 32. Journey Through EDM Environments. Pre-design of the level 1 - 'Ambient/Chill-Out'

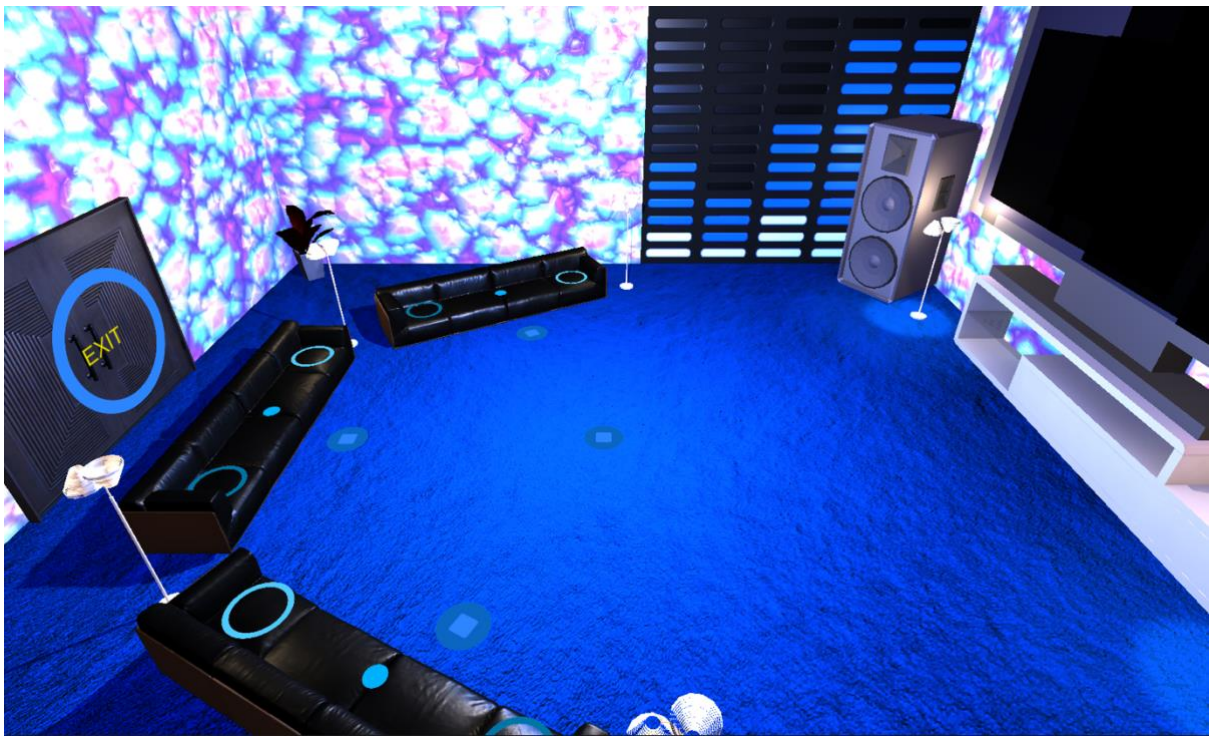

Figure 33. Journey Through EDM Environments. Level 1 'Ambient/Chill-Out' in-game view

A player enters the room and has options to teleport to different sofas. While 'sitting' on a sofa, a player can see circle triggers. While triggering these triggers, dance avatars appear on the TV screen, and a player is 'watching the TV' and observing the movements of dance avatars.

Audiovisual segments are 0’.52’’ seconds long due to the length of the video files. The length of the videos itself determined the musical materials and, consequently its structure.

After engagement with the audiovisual triggers, a player can exit the game, transporting him/her back into the corridor space. When triggering the pink door, a player will experience interaction with the triggers on the dance floor. The circles are placed on the musical instruments. These musical instruments represent the audible layers. (*Figures 34* and *35*)

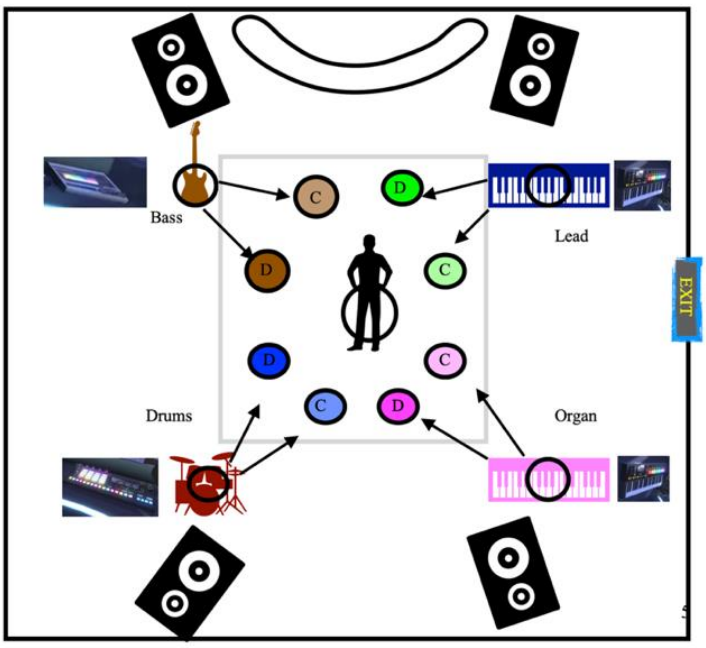

Figure 34. Journey Through EDM Environments. Pre-design of the level 2 'House'

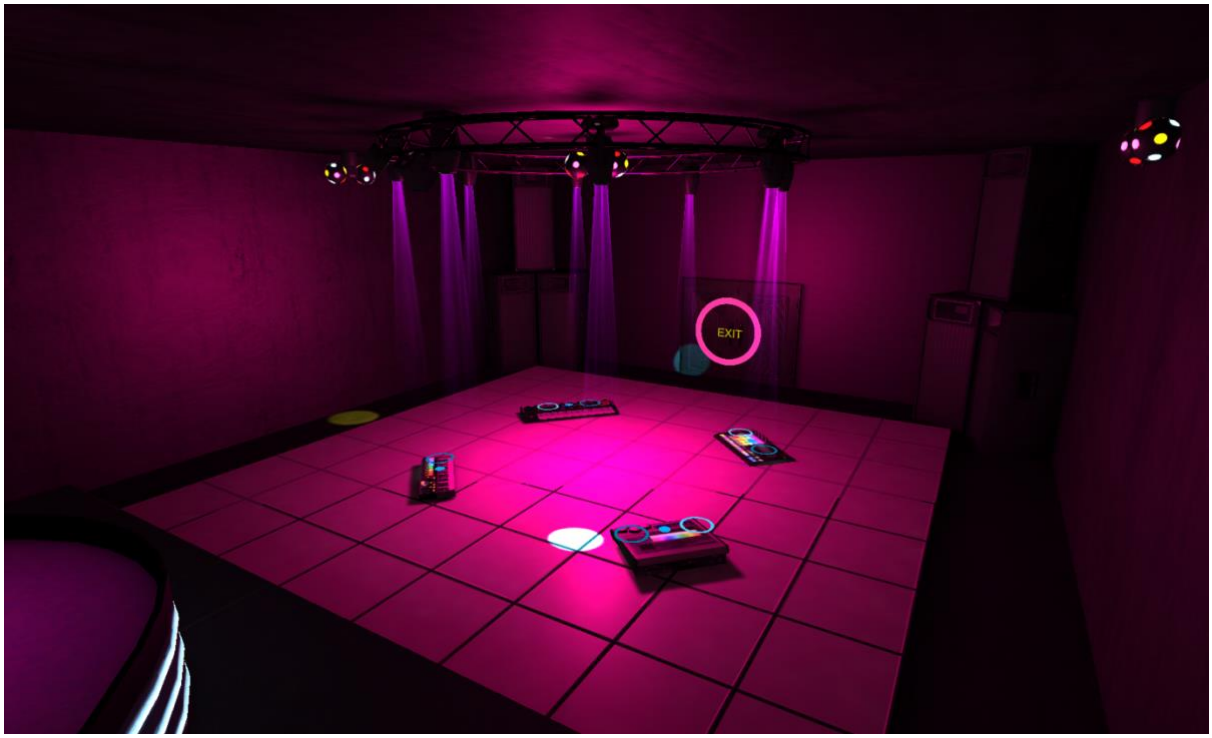

Figure 35. Journey Through EDM Environments. Level 2 'House' in-game view

When triggering the purple door, a player will find himself/herself on a DJ stage in a nightclub space. The triggers are positioned on a DJ desk as circles. The player sees dance avatars appearing on the dancefloor when triggering the circles. (*Figures 36* and *37*)

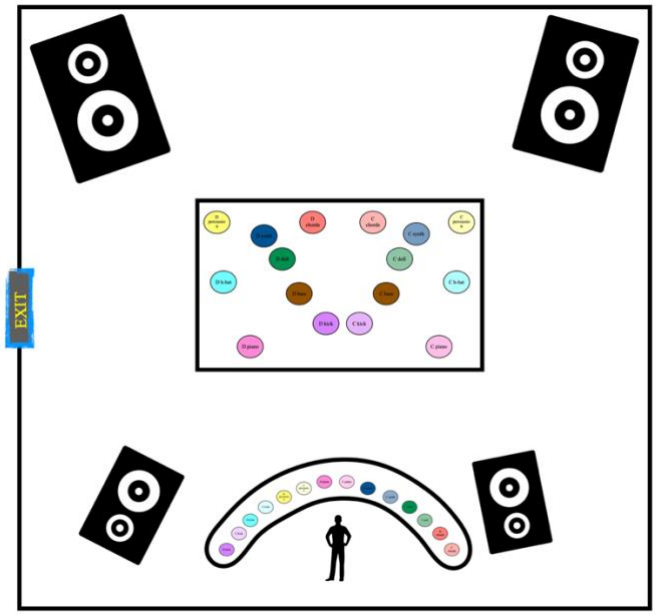

Figure 36. Journey Through EDM Environments. Pre-design of the level 3 'Techno'

Figure 37. Journey Through EDM Environments. Level 3 'Techno' in-game view

When triggering the orange door, a player will find himself/herself on a dancefloor, similar to the House level. The triggers are positioned on the top of musical instruments; however, the dance avatars appear in different places when a player triggers them. The player has to look around and move to find the dancer. This interesting aspect was made to gratify the experience and variety of each level. (*Figures 38* and *39*)

Initially, I wanted to use orange colour as a base colour for the level. However, due to issues with editing the dance videos, some of the avatars produced a green shadow. I decided to add some additional green lights to mask this detail.

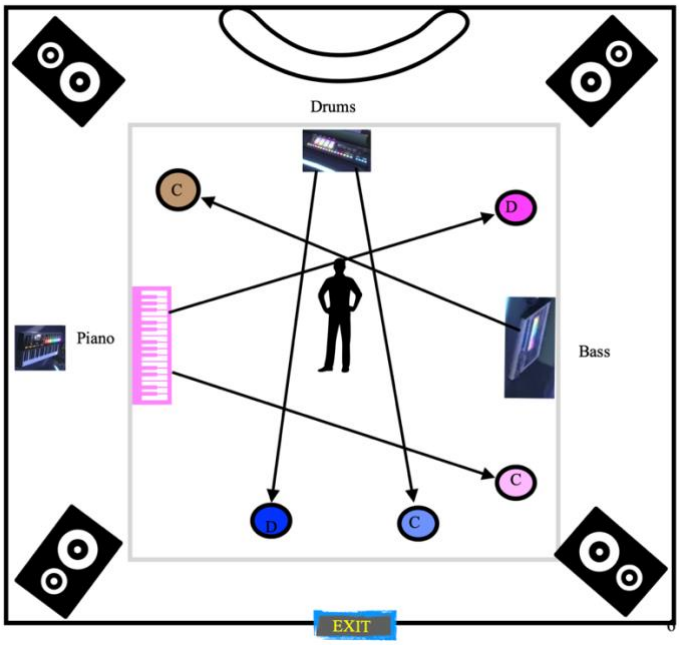

Figure 38. Journey Through EDM Environments. Pre-design of the level 4 'Drum 'n' Bass'

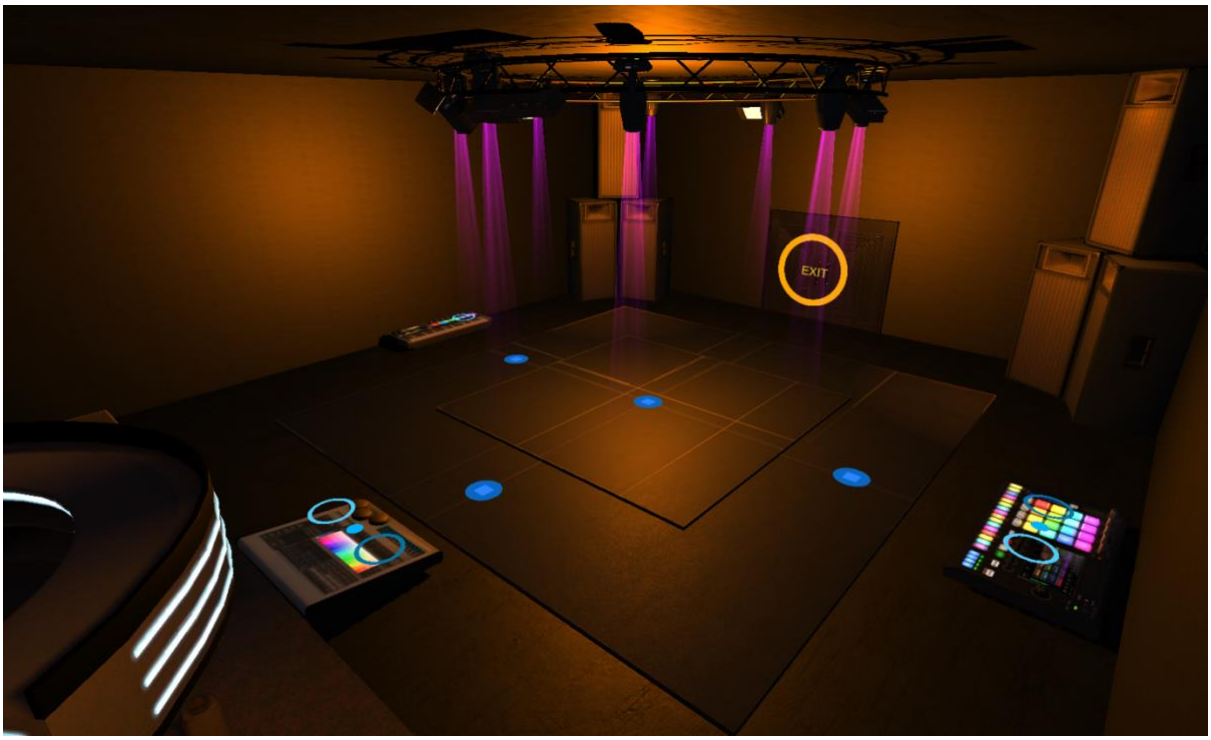

Figure 39. Journey Through EDM Environments. Level 4 'Drum 'n' Bass' in-game view

The initial prototype of the game did not have any written instructions, as I wanted the player to explore the game without a specific set of instructions, be curious and try for

yourself what the game can do. However, when showing the game to people for feedback, players were initially confused about what to do or expect. I integrated the pop-up messages to guide the player based on that feedback. The pop-up messages appear when a player enters the game at the start: 'point at the doors with the joystick to enter and exit levels', 'play with circles by pointing at them with joysticks. You can turn them 'on' and 'off'', 'listen to the music and watch the dancers; play with different circles combinations'. At the Drum 'n' Bass level, the player sees one pop-up message, 'look around to find the dancer' when triggering the first trigger. This was done to avoid players' confusion and understand the level's gameplay.

From the musical point of view, this project prompted me to creatively investigate the correlation of EDM and game music compositional techniques. From another perspective, I developed my work through devising in-game interactions of a player with built-in game triggers. I am also suggesting aesthetic novelty in professional dancers in a social dance space environment — a nightclub. From the movement perspective, I am exploring how the dancers from different dance backgrounds react to my pre-composed musical elements.

Overall, through this piece, I explored the movement of screendance gestures, games, VR, and I brought all these elements into one medium. I collaborated with other people, negotiating, and establishing my personal/compositional voice. I found it extremely creative to design a game’s media space musically.

This chapter explored the process of my compositional involvement with media technologies. The technical adaptation and understanding of media design have helped me expand my compositional ideas to interdisciplinarity further by merging screendance and games into VR in *Plasticity* and *Journey Through EDM Environments*.

Conclusion

Through this research, I explored a personal compositional framework through movement, collaboration, and media as creative inspiration. Through the practical examples of my portfolio, I investigated the effect of movement on the creative process for audiovisual music composition. I looked at modes of collaboration with other artists from different disciplines as creative methods for my practices and the development/negotiation of my compositional voice and overall auteurship.

I experimented with various technologies and adapted my approach to movement in screendance, games and VR media. Through *Loneliness*, I explored composing for movement to silent improvisation; in *Moving Away* I explored working with a director/choreographer; *In Angst, I See You* and *Dividuals,* I challenged myself to experiment with my own concepts. Through *Collage*, I experimented with composing for movement as well as video edits. Through *Stay*, I engaged with my musical ideas for a pre-existing screendance video.

Through *Cube*, I learned how to implement my music into the game media. Through *Thing-in-Itself, VR Circuit* and *The Tension,* I collaborated with game programmers and gained the necessary skills for interdisciplinary practices, which gave me the influence to apply all gained knowledge to *Plasticity* and *Journey Through EDM Environments*.

Through *Plasticity* and *Journey Through EDM Environments*, I brought my creative ideas into one medium — integrated interactive music techniques in screendance, providing a gamified experience in the VR medium and looked at the aesthetic relationship between screendance and EDM. The act of expansion of my interdisciplinary areas by the use of media, movement and technologies has helped me to express my musical ideas.

As a composer, looking beyond my research, I see the possibilities in further research into virtual environments and their space, building complex musical structures (popular, EDM, as well as classical forms, such as symphonies, fugues, concertos, etc.) with visual objects in media, experimenting with audiovisual polyrhythmic combinations. On a smaller scale, with the development of VR technologies, I also see the demand for small audiovisual/visual loops in the form of Non-Fungible Tokens[147] (NFTs) digital assets; expansion of NFT animated avatars into realistic human avatar appearances (as in *Journey Through EDM Environments*) and integration of these audiovisual loops for constructing further interdisciplinary compositions in Metaverse[148] platforms, such as *Decentraland*[149], *Sandbox*[150], *Horizon Worlds*[151], or similar VR, AR, artificial technological platforms. The visual avatars can be looked at as objects and applied using game-building techniques for the creation of choreographies and musical experiences.

[147] Matt Forthnow and QuHarrison Terry, *The NFT Handbook: How to Create, Sell and Buy Non-Fungible Tokens* (New Jersey: John Wiley & Sons, Inc., 2022), 18.
[148] Sang-Min Park, Young-GabKim, 'A Metaverse: Taxonomy, Components, Applications, and Open Challenges', *IEEE Access* 10, (2022): 4209–4251, doi: 10.1109/ACCESS.2021.3140175.
[149] 'Decentraland, Create, Explore and Trade in the First-Ever Virtual World Owned by its Users', accessed August 31, 2022, https://decentraland.org/.
[150] 'The Sandbox', accessed August 31, 2022, https://www.sandbox.game/en/.
[151] 'MetaQuest, Horizon Worlds', accessed August 31, 2022, https://www.oculus.com/horizon-worlds/?locale=en_GB.

Bibliography

Abraham, Kyle. *Blurring Boundaries: Urban Street Meets Contemporary Dance.* Leicester: Serendipity, 2016.

Abraham, Micah. 'The 6 Main Types of Anxiety — Which Do You Have?' Calm Clinic, last updated October 10, 2020. Accessed August 25, 2022. https://www.calmclinic.com/anxiety-guide/main-types.

'Adobe Premiere Pro, Video Editing That's Always a Cut Above'. Accessed August 31, 2022. https://www.adobe.com/uk/products/premiere.html.

Akinleye, Adesola. 'Geography of the Body'. *Dance UK* 70, (2008): 21.

Alekseeva, Elena. 'Alexandra Louise & Elena Alekseeva interview'. December 17, 2014. Accessed August 25, 2022. https://www.youtube.com/watch?v=hecvy5bmG9c.

Alekseeva, Elena. 'Meaning of Life. Music by Elena Alekseeva Choreography and Dance by Michael W L Courtney (Ras Mikey)'. January 27, 2014. Accessed August 25, 2022. https://www.youtube.com/watch?v=72JItdiXi1k.

Anderson, Callum. 'Screendance in the Wake of Screened Dance: Moving Forward Through Interactive Video'. *The International Journal of Screendance* 12 (2021): 113—127.

Audiokinetic. 'Wwise, The Most Advanced, Feature-Rich Interactive Audio Solution'. Accessed August 24, 2022. https://www.audiokinetic.com/en/products/wwise/.

Audio Trip. Kinemotik Studios/Andromedia Entertainment. 2020. English, Quest, Quest 2.

Barthes, Roland. 'The Death of the Author'. In *Twentieth-Century Literary Theory*, 2nd edition by Kenneth M. Newton, 120—123. London: Palgrave, 1997.

Barnard, Dom. 'History of VR — Timeline of Events and Tech Development'. Virtual speech. August 6, 2019. Accessed August 27, 2022. https://virtualspeech.com/blog/history-of-vr.

Beat Saber. Beat Games/Beat Games. 2019. English, French, German, Japanese, Korean,

Spanish (Chile), Spanish (Colombia), Spanish (Mexico), Spanish (Peru), Spanish (Puerto Rico), Spanish (Venezuela). Quest, Quest 2.

Bennett, Joe. 'Collaborative Songwriting: The Ontology of Negotiated Creativity in Popular Music Studio Practice'. *Journal of the Art of Record Production* 8 (2013): 1–18.

Brannigan, Erin. *Choreography and the Moving Image.* New York: Oxford University Press, 2011.

Bryson, Steve. 'Virtual Reality: A Definition History — A Personal Essay'. December 16, 2013. Accessed August 27, 2022. https://arxiv.org/pdf/1312.4322.pdf.

Bonobo. 'Bonobo: Bambro Koyo Ganda (feat. Innov Gnawa) (Official Video)'. April 27, 2017. Accessed August 24, 2022. https://www.youtube.com/watch?v=ArWQWAUoiSU.

Bowers, Faubion. *The New Scriabin: Enigma and Answers*. Newton Abbot: David and Charles, 1974.

Brown, Andrew. 'Modes of Compositional Engagement'. *QUT EPrints,* May 27, 2004. Accessed August 26, 2022. https://eprints.qut.edu.au/168/.

Butler, Mark J. *Unlocking the Groove; Rhythm, Meter, and Musical Design in Electronic Dance Music.* Bloomington: Indiana University Press, 2010.

Calcagno, Antonio. 'Foucault and Derrida: The Question of Empowering and Disempowering the Author'. *Human Studies* 32, no. 1 (2009): 33—51.

Capel, Emilie. 'Ziyan Yaman Okur/Emilie Capel (Insightful Music)'. April 21, 2014. Accessed August 25, 2022. https://www.youtube.com/watchv=bUGMtBnzjTQ&feature=youtu.be&list=PLlXz6_aAG33QLaM7WfAGWVpbea_mn9vm8.

Carroll, Noël. 'Toward a Definition of Moving-Picture Dance'. *Dance Research Journal* 33, no. 1 (2001): 46—61.

Chion, Michel, and Gorbman, Claudia. *Audio-Vision: Sound on Screen.* New York;

Chichester: Columbia University Press, 1994.

Ciciliani, Marko. 'Music in the Expanded Field — On Recent Approaches to Interdisciplinary Composition'. In *Beiträge zur Neue Musik*, edited by Michael Rebhahn and Thomas Schäfer, 23-35. Mainz: Schott, 2017.

Cook, Nicholas. *Analysing Musical Multimedia.* Oxford: Clarendon Press, 1998.

Collins, Karen. *Game Sound: An Introduction to the History, Theory and Practice of Video Game Music and Sound Design.* Cambridge, MA: MIT Press, 2008.

Collins, Karen. *Playing with Sound: A Theory of Interacting with Sound and Music in Video Games.* London: MIT Press, 2013.

Collins, Nicholas, Margaret Schedel, and Scott Wilson. *Electronic Music*. Cambridge: Cambridge University Press, 2013.

Copland, Aaron. *What to Listen for in Music.* New York: McGraw-Hill Book Co., 1939.

'Decentraland, Create, Explore and Trade in the First-Ever Virtual World Owned by its Users'. Accessed August 31, 2022. https://decentraland.org/.

Deleuze, Gilles, and Guattari, Felix. 'A Thousand Plateaus: Capitalism and Schizophrenia'. *Journal of Interdisciplinary History* 19, no. 4 (1989): 657—659.

Deleuze, Gilles. 'Postscript on the Societies of Control'. *October* 59 (1992): 3—7.

Deutsch, Diana. *The Psychology of Music.* 3rd ed. Amsterdam: Academic Press, 2013.

Donnelly, Kevin J. *Occult Aesthetics: Synchronization in Sound Film*. New York: Oxford University Press, 2014.

Donnelly, Kevin. 'The Triple Lock of Synchronization'. In *The Cambridge Companion to Video Game Music*, edited by Melanie Fritsch and Tim Summers, 94—109. Cambridge: Cambridge University Press, 2021.

Draper, Paul and Millward, Frank. 'Music in Perpetual Beta: Composition, Remediation, and "Closure"'. In *The Oxford Handbook of Music and Virtuality*, edited by Sheila Whiteley

and Shara Rambarran, 248—265. New York City: Oxford University Press, 2016.

Dreamachine. 'Dreamachine | A New, One-of-a-Kind Immersive Experience'. Accessed July 20, 2022. https://dreamachine.world.

Electronauts. Survios/Survios. 2019. English, Quest, Quest 2.

Eno, Brian. 'The Studio as Compositional Tool'. In *Audio Culture: Reading in Modern Music*, edited by Christopher Cox and Daniel Warner, 185—188. New York, NY: Bloomsbury Academic, 2017.

Faller, Greg. 'From Choreocinema to Experimental Screendance: A Personal Archaeology'. In *Movies, Moves and Music - The Sonic World of Dance Films*, edited by Mark Evans and Mary Fogarty, 14—42. Sheffield: Equinox Publishing, 2016.

'Final Cut Pro, Storytelling at its Most Powerful'. Accessed August 31, 2022. https://www.apple.com/uk/final-cut-pro/.

Forthnow, Matt and Terry, QuHarrison. *The NFT Handbook: How to Create, Sell and Buy Non-Fungible Tokens.* New Jersey: John Wiley & Sons, Inc., 2022.

Foucault, Michael. *Discipline and Punish: The Birth of the Prison.* New York: Vintage, 1979.

Fox, Christopher. 'New Complexity'. *Grove Music Online* (2001). https://doi-org.ezproxy01.rhul.ac.uk/10.1093/gmo/9781561592630.article.51676.

Gibbons, Elizabeth. *Teaching Dance: The Spectrum of Styles.* Bloomington, United States: AuthorHouse, 2007.

Gibson, Eleanor J. *Perceiving the Affordances: A Portrait of Two Psychologists.* Hove and New York: Psychology Press, 2013.

'Gibson/Martelli, Dazzle'. Accessed August 31, 2022. https://gibsonmartelli.com/portfolio/dazzle/.

'Gibson/Martelli, Expanded Fields'. Accessed August 31, 2022. https://gibsonmartelli.com/portfolio/expanded-fields/.

'Gibson/Martelli, SwanQuake'. Accessed August 31, 2022. https://gibsonmartelli.com/portfolio/swanquake/.

Goodman, Steve. 'Rhythmanalysis'. In *Sonic Warfare: Sound, Affect, and the Ecology of Fear*, 85—90. Cambridge, MA: MIT Press, 2012.

Gorbman, Claudia. *Unheard Melodies: Narrative Film Music.* London: BFI, 1987.

Greenwood, Jonny, O'Brien Ed, Philip Selway, and Thom Yorke. *Reckoner*. By *Radiohead*. Recorded in 2007. Nigel Godrich, released in 2008. CD-R, download.

Grodal, Torben. 'Video Games and the Pleasures of Control'. In *Media Entertainment: The Psychology of its Appeal*, edited by Dolf Zillman and Peter Vorderer, 197–213. Mahwah, NJ: Lawrence Erlbaum Associates, 2000.

Hayden, Sam and Windsor, Luke. 'Collaboration and the Composer: Case Studies from the End of the 20th Century'. *Tempo* 61, no. 240 (2007): 28–39.

Hantschel, Florian and Bullerjahn, Claudia. 'The Use of Prototype Theory for Understanding the Perception and Concept Formation of Musical Styles'. Proceedings of the 14th International Conference on Music Perception and Cognition, San Francisco, July 5—9, 2016.

Hewitt, Michael. *Composition for Computer Musicians.* Boston, Mass: Course Technology, 2009.

Hills-Duty, Rebecca. 'Update: VR Dance Performance Through You Released on Gear VR'. GMW3. August 2017. Accessed August 27, 2022. https://www.gmw3.com/2017/08/vr-dance-performance-through-you-released-on-gear-vr/.

Hoffert, Paul, and Feist, Jonathan. *Music for New Media: Composing for Videogames, Websites, Presentations and Other Interactive Media*. Boston, Mass: Berklee Press, 2007.

Iba, Takashi. *Collaboration Patterns: A Pattern Language for Creative Collaborations.* Iba Laboratory, Japan: Creative Shift, 2014.

Ingold, Tim. *Making: Anthropology, Archaeology, Art and Architecture.* London: Rutledge, 2013.

Jennings, Stephanie C. 'Co-Creation and Distributed Authorship of Video Games'. In *Examining the Evolution of Gaming and Its Impact on Social, Cultural, and Political Perspectives*, edited by Valentine, Keri Duncan and Jensen, Lucas John, 123—146. USA: IGI Global, 2016.

John-Steiner, Vera. *Creative Collaboration.* Oxford: Oxford University Press, 2006.

Katherine, Nancy. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics.* Chicago: University of Chicago Press, 2010.

Kauffman, Stuart A. *The Origins of Order: Self Organization and Selection in Evolution.* New York: Oxford University Press, 1993.

Kalinak, Kathryn. *Settling the Score: Music and the Classical Hollywood Film.* Madison: University of Wisconsin Press, 1992.

Keller, Sarah. *Maya Deren: Incomplete Control.* New York: Columbia University Press, 2015.

Klein, Alysia. 'Cut! A Screendance Documentary'. December 17, 2014. Accessed August 25, 2022. https://www.youtube.com/watch?v=cMZ-2_a8MRU.

Lai, Emily R. 'Collaboration: A Literature Review'. London: Pearson, 2011.

Leeds-Hurwitz, Wendy. *Semiotics and Communication: Signs, Codes, Cultures.* Hillsdale, NJ: Lawrence Earlbaum, 1993.

Lockyer, Bob. 'Recording Dance: A Full and Truthful Record?'. *RSA Journal* 137, no. 5399 (October 1989): 703—709.

Logic Pro. 'Logic Pro | Ridiculously Powerful. Seriously Creative'. Accessed August 24, 2022. https://www.apple.com/uk/logic-pro/.

McPherson, Katrina. *Making Video Dance: A Step-by-Step Guide to Creating Dance for the*

Screen. 2nd ed. Oxon and New York: Routledge, 2019.

Medina-Gray, Elizabeth. 'Analyzing Modular Smoothness in Video Game Music'. *Music Theory Online* 25, no. 3 (2019). Accessed August 27, 2022. www.mtosmt.org/issues/mto.19.25.3/mto.19.25.3.medina.gray.html.

Medina-Gray, Elizabeth. 'Modularity in Video Game Music'. In *Ludomusicology: Approaches to Video Game Music*, ed. Michiel Kamp, Tim Summers, and Mark Sweeney, 53—72. Sheffield: Equinox, 2016.

'MetaQuest, Horizon Worlds'. Accessed August 31, 2022. https://www.oculus.com/horizon-worlds/?locate=en_GB.

Morrison, James. *Auteur Theory and My Son John*. New York: Bloomsbury Academic, 2018.

Mossman, Kenneth L. *The Complexity Paradox: The More Answers We Find, The More Questions We Have*. Oxford; New York: Oxford University Press, 2014.

Moore, Allan F. *Rock: The Primary Text: Developing a Musicology of Rock.* 2nd ed. Farnham: Ashgate, 2001.

Musescore. 'Create, Play and Print Beautiful Sheet Music: The World's Most Popular Notation Software'. Accessed August 24, 2022. https://musescore.org/en.

Nakajima, Rikizo. *Kant's Doctrine of the 'Thing-in-Itself'*. New Haven, Conn.: Price, Lee & Adkins, 1889.

Ohshape. Odders Lab/Odders Lab. 2020. English, Chinese, French, German, Japanese, Korean and Spanish, Quest, Quest 2.

Park, Sang-Min, and Kim, Young-Gab. 'A Metaverse: Taxonomy, Components, Applications, and Open Challenges'. *IEEE Access* 10 (2022): 4209—4251, doi: 10.1109/ACCESS.2021.3140175.

Party for Introverts. 'Thing-in-Itself'. Accessed August 24, 2022. https://partyforintroverts.com/thing-in-itself/#more-3.

Phillips, Winifred. *A Composer's Guide to Game Music.* Cambridge, MA: MIT Press, 2014.

Prigogine, Ilya and Stengers, Isabelle. *Order out of Chaos: Mans New Dialogue with Nature*. London: Verso, 2017.

Resident Advisor. 'Burial's Untrue: The Making of a Masterpiece'. Resident Advisor. November 6, 2017. Accessed August 27, 2022. https://www.residentadvisor.net/features/3102.

Reynolds, Dee. "Glitz and Glamour' or Atomic Rearrangement: What do Dance Audiences Want?' *Dance Research: The Journal of the Society for Dance Research.* 28, no.1 (2010): 19—35.

Reynolds, Simon. *Energy Flash: A Journey Through Rave Music and Dance Culture.* London: Faber and Faber, 2013.

Rietveld, Hillegonda C. *This Is Our House: House Music, Cultural Spaces and Technologies*. Aldershot: Ashgate, 2003.

Roberts, Adam, dir. *Blue/Yellow.* 1995; France 2/BBC, 1995.

Robertson, Robert T. *Cinema and the Audiovisual Imagination: Music, Image, Sound*. London: Tauris, 2015.

Rosenberg, Douglas. *Screendance: Inscribing the Ephemeral Image*. New York: Oxford University Press, 2012.

Rosenkrantz, Arild. *Eurythmy the Art of Movement: As Inaugurated by Rudolf Steiner at the Goetheanum, Dornach, Switzerland.* UK: Anthroposophical Publishing Company, 1980.

Savage, Karen and Symonds, Dominic. *Economies of Collaboration in Performance: More than the Sum of the Parts.* Basingstoke, Hampshire: Palgrave Macmillan, 2018.

Skinner, Frank. *Underscore*. New York: Criterion Music, 1960.

Smith-Autard, Jacqueline. *Dance Composition*. 6th ed. London: Methuen Drama, 2020.

Snoman, Rick. *Dance Music Manual: Tools, Toys, and Techniques*. 3rd ed. New York: Focal

Press, 2014.

'Sony, PXW-FS7’. Accessed August 31, 2022. https://pro.sony/en_GB/products/handheld-camcorders/pxw-fs7.

Spallazzo, Davide and Mariani, Ilaria. 'Keeping Coherence Across Thresholds. A Narrative Perspective in Hybrid Games'. In *Hybrid Play*, edited by Adriana de Souza e Silva and Ragan Glover-Rijkse, 30-46. London and New York: Routledge Advances in Game, 2020.

Stevens, Richard and Raybould, Dave. 'Designing a Game for Music Integrated Design Approaches for Lucid Music and Interactivity'. In *The Oxford Handbook of Interactive Audio*, edited by Kasey Collins, Bill Kapralos, and Holly Tessler, 147—166. Oxford: Oxford University Press, 2017.

Summers, Tim. (2018). 'Music and Transmediality: The Multi-Media Invasion of *Jeff Wayne's Musical Version of The War of the Worlds'*. *Twentieth-century Music* 15, no. 2 (2018): 231—258.

Sweet, Michael. *Writing Interactive Music for Video Games*. Upper Saddle River, NJ: Addison-Wesley, 2014.

Taylor, Alan. "Collaboration' In Contemporary Music: A Theoretical View'. *Contemporary Music Review* 35, no. 6 (2017): 562–563.

'The Sandbox'. Accessed August 31, 2022. https://www.sandbox.game/en/.

Thornton, Samuel. *A Movement Perspective of Rudolf Laban*. London: Macdonald & Evans, 1971.

Tube VR. Hadean/Hadean. 2021. Quest/VRChat.

Unity. 'The World’s Leading Platform for Real-Time Content Creation'. Accessed August 24, 2022. https://unity.com/.

Unreal Engine. 'Unreal Engine | The World's Most Open and Advanced Real-Time 3D Creation Tool'. Accessed August 24, 2022. https://www.unrealengine.com/en-US/.

Vygotsky, Lev Semenovich. *Mind in Society: The Development of Higher Psychological Processes*. Translated from Russian and edited by Michael Cole. Cambridge, Mass.; London: Harvard University Press, 1978.

Walshe, Jennifer. 'The New Discipline'. In *Audio Culture: Reading in Modern Music*, edited by Christopher Cox and Daniel Warner, 341—343. New York, NY: Bloomsbury Academic, 2017.

Walon, Sophie. 'Poetic Phenomenology in Thierry De Mey's Screendances: Open Corporealities, Responsive Spaces, and Embodied Experiences'. *The International Journal of Screendance* 4 (2014): 28—43.

Windsor, Luke W., and De Bézenac, Christoph. 'Music and affordances'. *Music Scientiae* 16, no.1 (2012): 102—120.

Wood, Karen. 'Kinaesthetic Empathy: Conditions for Viewing'. *The Oxford Handbook of Screendance Studies*, edited by Douglas Rosenberg, 245—262. Oxford: Oxford University Press, 2016.

Wycherley, Mary and Simpson, Jürgen. 'Light Moves Festival'. Accessed August 15, 2022. https://lightmoves.ie/.

YarbTheLegend. 'Aphex Twin — Digeridoo (1080p HD/HQ)'. October 18, 2012. Accessed August 25, 2022, https://www.youtube.com/watch?v=S5UBYOv1G9A.

Zilczer, Judith. 'American Rhapsody: From Modern to Postmodern in Visual Music'. In *The Oxford Handbook of Sound and Image in Western Art*, edited by Yael Kaduri, 17—35. New York: Oxford University Press, 2016.