

A Critique of Linguistic Capitalism: Provocation/Intervention

Pip Thornton

Royal Holloway, University of London (corresponding author)

Thornton, P. (2018). A critique of linguistic capitalism: provocation/intervention. *GeoHumanities* (forthcoming - in press)

Abstract

Language has always been a tool of power over people and places, yet in today's world of digital communication and advertising, words flowing through the proprietary platforms of the web are used increasingly as vessels for the creation and circulation of capital. This method of linguistic capitalism (Kaplan 2014) is how Google became one of the most successful and wealthy companies in the world. This paper argues that this neoliberal commodification of language has both linguistic and political consequences, affording unprecedented power to Google in the control of the words it sells, and its consequent influence over the wider discourse. The paper evokes Orwell's 'Newspeak' as a provocation to critique Google's hold over digitised language, and introduces a radical new method and artistic intervention called {poem}.py which fuses Google's AdWords platform with poetry and code in order to make visible and subvert the workings and the power of linguistic capitalism.

Keywords: *Google, algorithm, data, poetry, language*

Introduction

This paper is born of a love of language; of Stafford's poetry, Orwell's prose, and of the lyrics that define lives. But language is so much more than literature. Language is communication, it is community, it is wealth, politics, and it is power over both people and places. It builds societies and it subjugates them. While this critique of linguistic power may not be new, what *is* new today is that in an age of digital capitalism and big tech monopolies, words have become commodities which gain in economic value the more and the faster they circulate through digital spaces. This is perhaps most apparent in the way Google monetises the language that flows through the search engine via its AdWords platform, which is the main source of the

company's wealth. In a process Frederic Kaplan has called 'linguistic capitalism', each Google search triggers an auction for the words contained in the search query, with advertisers bidding for particular keywords in order to obtain the most prominent positions on the results page. Indeed, with the near ubiquity of Google's platforms and advertising empire, which in effect strip narrative context from the words we use while at the same time loading them with dissonant capital, it has become almost impossible to critique the system without adding to its economic value. The text of Emails, blogs, news, search queries and literature is all in some way generating capital for one private, opaque and ultimately unchallengeable company. This is a neoliberalisation of discourse at a fundamental and systemic level. Yet what is to be done about this from within the system? As scholars and researchers have shown (Kitchin 2017, Pasquale 2015), attempting to critique or explain any system or platform that functions with the use of proprietary algorithms is difficult and problematic. The workings of capital generating algorithmic systems such as Facebook and Google are closely guarded 'black-boxed' trade secrets. In addition to this, tweaks, a/b testing, and other personalisations such as geolocation (Zook and Graham 2007), can also make it hard to research objectively. It is today surely almost impossible to conduct critical research into, or with the help of digital technology without somehow utilising – consciously or unconsciously - the very structures we seek to critique. This paper acknowledges these methodical hurdles, and instead takes a different approach in order to make visible the workings and politics of the algorithmic systems of linguistic capitalism through provocation and artistic intervention. I am therefore purposefully making my critical stance from within the master's house (Lorde 2012), turning the algorithm back on itself, or as Mahnke and Uprichard suggest, 'algorithming the algorithm' (2014), in order to expose its power and influence over the tools we are increasingly coerced and drawn into using in order to communicate and function in today's digital society.

In this paper, I introduce a project called {poem}.py which uses the Google AdWords keyword planner and Python code to compute the monetary value of poems and other texts, before printing them out as receipts [see Figure 1]. As well as exposing some of the methodological challenges of critiquing algorithmic processes such as Google AdWords, the project also reveals insights into the changing 'value' of words in a digital age. While this method in some ways exposes the knowledge producing

capacities of the linguistic market place (Thornton & Danaher 2018, Hayek 1945), providing insights into geographically and culturally specific nuances via the ever-fluctuating values of keywords, it also exposes the potential linguistic, political and discursive side effects and distortions of a linguistic marketplace fuelled by the digital advertising and Search Engine Optimisation (SEO) industries. Although it is true that we as users, our data, our attention and our labour have all in some way become commodities in an era of digital advertising (Pasquinelli 2009, Mager 2012, Nixon 2016), this paper argues that the digitisation and subsequent commodification of language is a particularly dangerous side-effect of today's digital economy. In this sense I would argue that the 'message', as described by Sut Jhally (2012), is still a vitally important issue of inquiry and critique, and in the case of AdWords is perhaps not so easily removed from its medium of dissemination. The messages we send and receive today are compromised in the process of exploitation by big tech companies such as Google, and the consequences of this are not only linguistic, but also inherently political.

I concentrate specifically on Google in the paper because of its sheer ubiquity and reach, which translates into what is a frightening power over media, politics and language. The legacies and implications of the power that can be held and wielded through the control of language are of course still evident today in the echoes of Empire that now extend to data colonialism (Thatcher et al. 2016) and the dominance of English as the language of the web and of academia. But following the literary theme of the project, the way digital language is mediated, restricted and controlled today also has strong parallels with the description of Newspeak in George Orwell's *Nineteen Eighty-Four*. In the novel, Newspeak is deployed by Ingsoc (the party of English Socialism, or more commonly just 'The Party') as a means of thought control and political power over people and places. As a provocation, and drawing parallels between Orwell and today's digital infrastructure, this article argues that the potential for political power and control also lurks behind the neoliberal logic of the language which flows through the various digital spaces and production networks of the web. The {poem}.py project is then an intervention which serves as a way to expose, subvert, and critique the workings of linguistic capitalism and to imagine the powerful political and cultural consequences of the fusion of language and capital in a digital age.

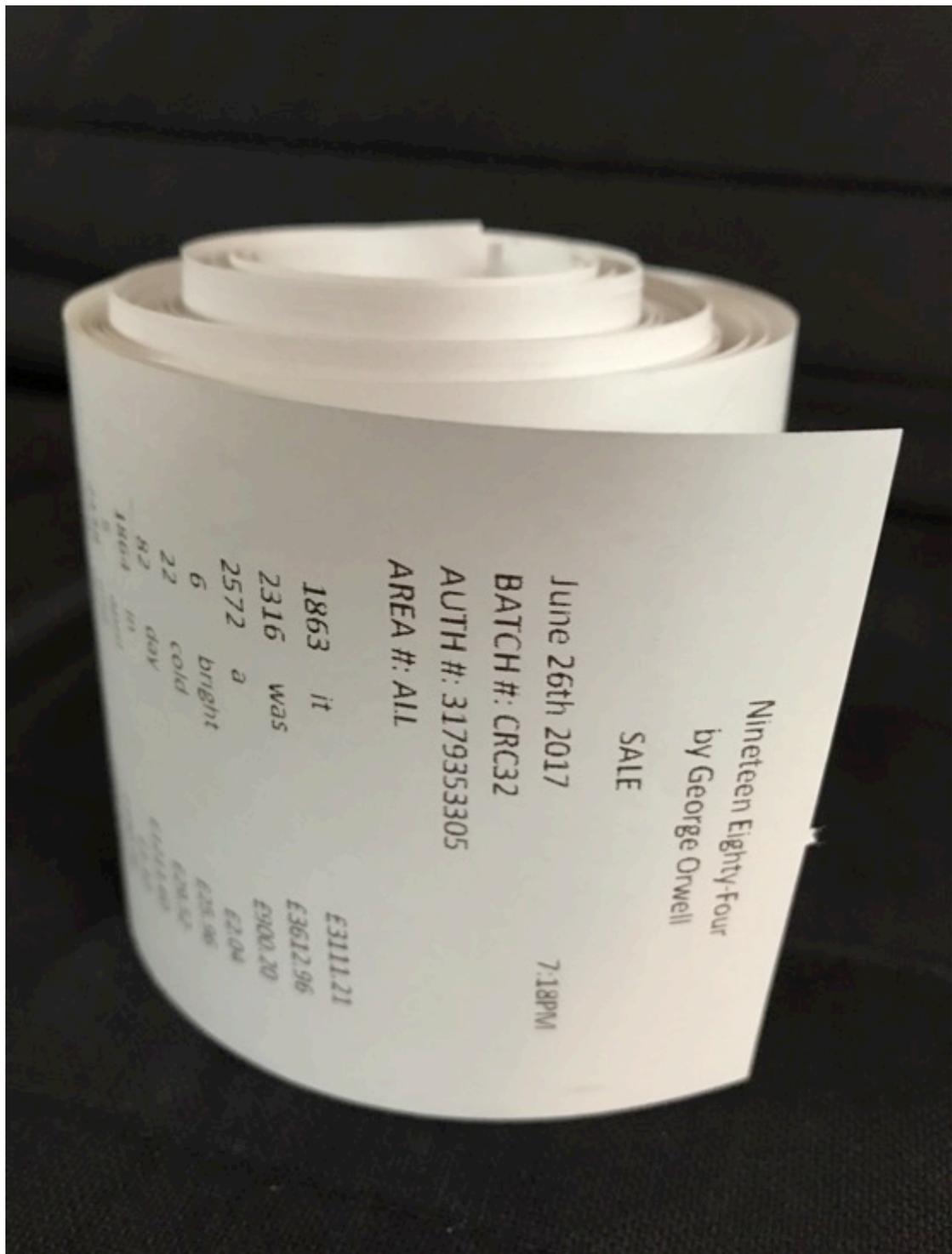


Figure 1: poem/receipts – 1984 (2017) (start), {poem}.py (photo author's own)

What is Linguistic Capitalism?

The term Linguistic Capitalism (as relates to Google AdWords) was first used in the work of theorist Frederic Kaplan (2014; see also Jobin & Kaplan 2013). AdWords is where Google earns the bulk of its money, and is why the company is so successful today. Sergey Brin and Larry Page first detailed their plan for Google as students at Stanford in 1998. Yet despite their original reluctance to ‘taint’ their search engine with advertising (Brin & Page 2012), they quickly realised that they would be unable to implement their ‘large scale hypertextual Web search engine’ without significant funding, and advertising was the obvious and easiest option. The idea of AdWords is very simple: if you want to guarantee a place at the top of the search engine results page (SERP), you have to pay to advertise on Google, and this means you have to bid for the word(s) you feel will attract the most traffic to your advert and to your site. Every time someone searches on Google for your keyword, a mini auction takes place, and if you are the highest bidder at that particular moment then you win the auction and, if your advert also ranks highly for quality, it will be displayed above the non-paid results with an ‘Ad’ sign in a box next to it to differentiate it from the organic search results. Every time somebody clicks on your advert, you then pay Google the price of the winning bid, which is in effect one cent/penny more than the second highest bid. This means that more clicks will mean you pay Google more, but you will also be generating more traffic to your site which is likely to generate more sales and/or exposure. Keywords can range and vary in price from pennies/cents to as much as 50-100 pounds/dollars per click, and fluctuate day to day and in different geographical regions and markets. As Kaplan (2014) observes, with AdWords, ‘Google has created the first global, real-time, and multilingual linguistic market’.

An integral part of Google’s AdWords platform is the keyword planner (KWP), which is provided as a free tool to be utilised by potential advertisers to plan their budgets and ascertain how much they might have to spend per click on a particular word or phrase in their campaigns. The keyword planner works by suggesting appropriate initial bid prices for advertisers based on an opaque algorithmic assessment of historic price per click (PPC) information and other factors including search volume and intended market. The KWP itself is free, although it does require an AdWords account to use, and the system does persistently encourage the user to begin a paid-for campaign. The data available for collection without a paid-for

campaign is limited, and is itself subject to unannounced tweaks and revisions. For example, in 2016 AdWords suddenly stopped giving detailed search volume data for keywords, instead providing search figures in vague and uninformative increments of 1k - 10k - 100k – 1m. It is also important to note that the bid prices suggested by the keyword planner do not necessarily match the actual PPC of a purchased keyword. As Kaplan notes, the price is just one part of the equation that determines the likely success of a keyword bid. The highest bid does not automatically ensure the top spot on the results page. Taken into algorithmic account is a ranking based on the quality and relevance of the advertising copy, the history of the advertiser and the strength of the hyperlinked webpage.

Despite its limitations, the keyword planner is also a useful tool for non-paid Search Engine Optimisation (SEO), the multi-billion-dollar industry that has grown up around the battle for the top ‘organic’ spots on the search results pages. SEO techniques such as keyword planning help people who are not paying for advertising to choose which words and phrases are more likely to be picked up by search algorithms, which might elevate their company, product, or political viewpoint to the top of the organic search results. This in turn affects what words are used in advertising copy, and also in the texts which make up the digital corpora of language on the web such as blogs, news articles and websites, or any other digitised writing that depends on SEO for its online presence. The corpora of linguistic data available to search algorithms, and the frequency and proximity of the words within it has a substantial effect on the mediation of information and the production of knowledge not only in terms of search results and the sometimes questionable results they return (Noble 2018), but also on algorithmic functions such as auto-complete and Google Translate (Thornton 2017a).

The bias within Google Search is of course well documented (Introna & Nissenbaum 2000, Granka 2010, Van Couvering 2010, Gillespie 2014, Noble 2018), as is the power the company holds (Diaz 2008, Fuchs 2011, Shaw & Graham 2017), but gathering data provided by the keyword planner on the suggested bid prices of words is a new and potentially incisive method to examine and expose the machinations and real-world implications of the commodification of language by Google and its various platforms. After all, the suggested bid price is the front-end encounter all advertisers

have with Google, and is therefore an important variable in the mediation and valuation of linguistic data. As a non-paying KWP user, I can harvest suggested bid prices for any word, at any time, on any combination of devices (i.e. desktop, tablet, mobile phone), and in any of Google's geographic markets, which can target specific areas as small as towns, villages, or even military bases. In addition to the suggested bid prices, the KWP also provides competition data, which gives a clearer - and perhaps more intuitive - indication of the popularity of a particular word or phrase. What is impossible to know, however, is how dynamic the KWP data is, how often it updates, and how closely it correlates with actual sale prices. With all of these limitations and possibilities in mind, instead of attempting an empirical analysis of Google's linguistic marketplace using traditional quantitative methods and outputs, my method has been to use the available KWP data to critique the AdWords platform and the wider linguistic economy through an artistic intervention called {poem}.py. But before I move on the intervention, I want to begin with a provocation, which goes some way to explaining why the commodification of language by Google is such an important political issue.

Provocation: the political power of linguistic capitalism

Weaponised by centuries of successive invasions and colonisations, and manipulated by repressive regimes or systems of governance, language has always been a tool of power. Language in this way is always capable of potentially devastating political and societal physical and discursive effects, which gives an extraordinary amount of power to those who have control over it. This section explores the political power embedded in Google's commodification of language using George Orwell's concept of Newspeak as a provocative method of critique.

George Orwell's *Nineteen Eighty-Four*, first published in 1949, has been an increasingly popular metaphor for debates around the privacy and surveillance issues of technologies such as Google and Facebook, as well as for the post-truth era of fake news, and alternative facts. Orwell's idea of Newspeak, the language of thought control and state propaganda employed to further the ideology and control of English Socialism (Ingsoc), is a compelling analogy for some contemporary issues, but I think rather than a straight forward comparison to the misinformation and accusations seemingly employed during (and after) the 2016 US Presidential campaign, there are

deeper problems within today's informational infrastructure that a more thorough reading of Orwell's text draws out.

In an appendix to the main text entitled *The Principles of Newspeak*, Orwell imagines that:

The purpose of Newspeak was not only to provide a medium of expression for the world-view and mental habits proper to the devotees of Ingsoc, but to make all other modes of thought impossible. It was intended that when Newspeak had been adopted once and for all and Oldspeak forgotten, a heretical thought - that is, a thought diverging from the principles of Ingsoc - should be literally unthinkable, at least so far as thought is dependent on words. (2000: 343)

The idea that 'thought is dependent on words', and indeed that a government can control the thoughts of the population by controlling language and discourse is central to Orwell's critique of the totalitarian regimes of both Nazi Germany and Soviet Russia, but has also been used in relation to the 'linguistic engineering' that took place in Maoist China (Ji 2004). It is, however, not an entirely unproblematic relationship. There are philosophical objections and indeed multi-lingual practicalities that question the causal effects of words on thought. As Fengyuan Ji points out, 'banning people from using heretical language will not automatically lead to the slow extinction of heretical ideas' (2004). This may indeed be so, but as more and more headlines appear about the 'nudging' effects of Facebook newsfeeds on voting behaviours; as stereotypes and prejudices are compounded by confirmation bias in auto-completions and auto-predictions, and as the minds of criminals are moulded by what they see on a Google search results page, there does indeed seem to be a somewhat problematic yet entirely relevant causal linkage between the words people see online, what they think, and what they ultimately do. As Safiya Umoja Noble has shown, search engines have the power to 'reinforce racism' and other oppressive behaviours (2018). The actionable effects of the words disseminated online through platforms such as Google and Facebook are now taken so seriously that both companies have been under considerable governmental pressure to combat fake news and hate speech. There are now even Google facilitated schemes to 'redirect' searches for Jihadist and extremist material online (Thornton & Danaher 2018).

The other important point about the analysis of linguistic engineering through the lens of totalitarian states, is the assumption that only governmental regimes have the power to bring about unquestioned, unchallenged and mandatory changes to language. Ji writes:

Linguistic engineering in nontotalitarian societies is not effectively controlled by the state, and even when it has political backing, people are free to criticise it and usually to ignore it. Linguistic change is brought about almost entirely by persuasion and social pressure, not by coercion, and it is often accompanied by heated debate and the persistence of rival usages (2004).

While this may perhaps have been true in a pre-digital age, the near monopoly market dominance that Google enjoys today, together with the opaque, proprietary nature of its operations, and the irredressible and almost unchallengeable power that it holds, does indeed bear many of the hallmarks of a state totalitarian regime. Any potential linguistic changes that result from its advertising strategies are not open to competition or debate, nor are they even clearly visible, but are the result of a far more insidious instrument of power. As David Golumbia writes, ‘we should never expect schemes to regularize, normalize, segment, or even culturally control language to be wholly effective without implementing similarly effective controls on all other social behavior’ (2009: 110).

The second point I want to make about the Orwell text concerns the limitations and restrictions of language that is so important to the idea of Newspeak, which was purposefully designed with

very few words to choose from. Relative to our own, the Newspeak vocabulary was tiny, and new ways of reducing it were constantly being devised. Newspeak, indeed, differed from most all other languages in that its vocabulary grew smaller instead of larger every year. (2000: 352)

We can see echoes of Newspeak in the shrinking of the creative vocabulary of digital language in favour of the most popular keywords, which might be cheaper, easier to

find, or more easily understood to both algorithms or human readers. Search Engine Optimisation techniques encourage the re-hashing of existing content, rather than anything new, and although it could be said that SEO is in itself a creative industry, unless it is also economically lucrative, there is little value to Google in original, or creative language, as my {poem}.py intervention will articulate in the next section. The exception to this rule could be niche words such as mesothelioma, the type of cancer caused by asbestos poisoning, which is searched for relatively infrequently, yet has an extremely high suggested bid price which corresponds with the lucrative litigation industry surrounding it and the increased likelihood of a return on investment (Battelle 2011). People searching for mesothelioma are presumably not Googling for fun.

But for the millions of other words which circulate the web more frequently, and might be used in Newspeak as part of ‘the business of everyday life... such things as eating, drinking, working, putting on one's clothes, going up and down stairs, riding in vehicles, gardening, cooking, and the like’ (2000: 344), it is their proliferation and multiplication that makes them valuable. Although it is one of the factors that might downgrade a site, SEO tactics still advocate moderate amounts of ‘keyword stuffing’ – the practice of filling web copy with varieties of popular keywords that might relate to the product or site being promoted. These keywords might be duplicates, synonyms, or even antonyms, as one SEO instructor once advised me. As long as the words are popular enough to direct a search to a site, it really doesn’t matter.

Important here too is the control over what words can mean. Newspeak words could only be used for one purpose:

their meanings were far more rigidly defined. All ambiguities and shades of meaning had been purged out of them.... It would have been quite impossible to use the... vocabulary for literary purposes or for political or philosophical discussion. (2000: 345)

Likewise, when you search for a word in Google, it is likely you are being returned the most commercially viable version of that word, which will be shown in more detail through my intervention. The poetic – or aesthetic – value of the words you

may have imagined, such as the ‘cloud’ example in Wordsworth’s *Daffodils*, is stripped away as it passes through the portal of the search bar, only to be replaced by its exchange value in the linguistic marketplace.

Now if you take those two ideas; i.e. that words have a real effect on how we think (and potentially on what we do), yet the way Google commodifies language encourages the shrinking of our online vocabulary, then it becomes even more clear how much power there is in being in control of the language that circulates online. Perhaps most disturbing about this situation is the emergence and dominance of a new linguistic economy in which the overriding motive for the regulation of language is not state political control (as in Maoist China or Orwell’s dystopia), but private capital gain. Not only do we now have a system which controls language (and therefore the wider discourse) by restricting its possibilities, and its creative potential, therefore presumably doing the same to how we think, but the system rests on a kind of neoliberal logic which is perhaps just as frightening in its scope, power and reach, than an overtly political one. As Franco ‘Bifo’ Berardi writes in response to Kaplan’s early work on linguistic capitalism (2011), the monetisation of language through Google’s AdWords platform means that ‘the economy is the universal grammar’ (2012). The argument I make in this article is that in a digital age, it is this monetised grammar that increasingly both constructs and deciphers language. The way the web works at the moment, with Google mediating and exploiting the circulation of monetised words, the potential for political influence comes often as a side effect of the economic incentive; through Macedonian teenagers exploiting AdSense with lucrative ‘fake news farms’, or through manipulation of the SEO industry. While concentrating on exploiting language for money, Google have in effect let money control the narrative. As I mentioned earlier, it is almost impossible to untangle the workings of black-boxed algorithmic systems such as Google AdWords, but it is still possible to show their *effects* both quantitatively and qualitatively. The next section will explain and demonstrate a project called {poem}.py, an artistic intervention which fuses these two approaches in order to make visible the political power that Google and linguistic capitalism have over people and places today, as well as exposing the potential linguistic effects of the datafication and monetisation of language.

Intervention: Politics, Poetry and Google

Since AdWords was launched in 2000, there have been a number of academic and artistic interventions into Google's commodification of language that have helped to shape my own project. Feuz, Fuller and Stalder's innovative experiment into search personalisation and what they call 'semantic capitalism' (2011), consisted of feeding the indexes of the greatest works of Michel Foucault, Emmanuel Kant and Friedrich Nietzsche through the search function of separate logged in Google accounts. By creating search histories for the philosophers, the idea was to see how these imagined 'personalised' profiles affected subsequent search results. The experiment revealed that personalised search results tend to serve the needs of advertisers rather than benefitting the individual user. Another problem they faced, which was very pertinent to my own project, was with Google's anti-spamming technology, which blocked some of the IP addresses from which they were running their automated searches.

Linguistic capitalism is also evident, although by its absence or erasure (Marczewska, 2015), in the way language moves through other digital spaces such as electronic mail. In 2010, design graduates Cabell and Huff (2013) set up an artistic experiment by sending each page of the novel 'American Psycho' (Ellis, 2010) between each other via Gmail accounts. Aware that Gmail algorithms read email traffic for the purpose of targeted advertising, they then recorded the adverts that were generated and, having removed the original text, reconstructed the book by footnoting the adverts on the otherwise empty pages. This was not only a brilliant nod to the kind of destructive consumerism Ellis was critiquing, but it reveals the shortcomings of these types of semantically trained algorithms when presented with creative or artistic language. Patrick Bateman's skinning and mutilation of women generated adverts for skin tightening and teeth whitening procedures; his violation of their bodies with rats prompts adverts for rodent control. I found this a fascinating way of showing what is happening to words when they move through digital space – in this case via electronic mail, which has invisibly stripped the words of their linguistic or creative value in favour of their exchange value. The words of the author, turned involuntarily into monetised data have been 'stripped of everything but that data's end product [which] constitutes perhaps both the purest document of digital capitalism and the sharpest critique of that capitalism' (Benzon & Sweeney, 2015). I was also fascinated by a 'happening' curated by the artist Christophe Bruno into the then fairly new Google

AdWords platform in 2002 (2002, 2012). Bruno opened an AdWords campaign and bid for a selection of cheap keywords. He then composed a series of adverts which, rather than contextualising the keywords and clearly trying to promote a product or service, were small snippets of poetic nonsense in which the keyword was entirely irrelevant. What Bruno was trying to test was whether or not the people who were served his adverts after searching for one of his keywords would be curious enough to click through to his website on a whim, even though the advert clearly was not what they had been looking for, thus subverting the logic of the market in favour of poetic intrigue. Luckily for his budget, only a few users did click through, but Bruno's plans to extend the experiment were ultimately thwarted by the quality control rankings that police AdWords for poorly performing – and poorly written- adverts. His keywords may have had poetic, or creative capital, but they had no commercial context, and therefore earned Google little money. Like the algorithmic reading of American Psycho through Gmail, AdWords' interest in language was based not on the literary or artistic value of Bruno's words, but on their economic potential as they moved through digital space.

{poem}.py: a critique of linguistic capitalism

My own intervention into linguistic capitalism also began with poetry and AdWords when I decided to experiment with working out how much poetry is 'worth' to Google (in monetary terms) by feeding poems through the AdWords Keyword planner and printing the results out as receipts. The poems I use for this process are usually taken from open source poetry websites. It is important to the creative vision of my project that the words being 'valued' by the KWP had in theory all been potentially exposed to monetisation in some way, for example appearing on sites which also host adverts, or even merely by virtue of being openly indexed and available to be found by search algorithms. In order to ensure this, I only use poems which have been cut and pasted from the web, or (as the project progressed) have been sent through Gmail and have therefore been made vulnerable to the algorithms that scrape emails for targeted advertising purposes (as per Cabell & Huff). One early attempt to monetise a spoken word poem failed for this reason. I had asked the attendees of a workshop I was co-organising to provide me with a favourite poem so I could print it off for them during my talk. Because I had not told the participants why I wanted them to send me a poem, some of them sent titles of poems that were only

available in formats which unintentionally resisted the process of commodification. The first was a spoken word poem called *Bog Eye Man*, by Jemima Foxtrot which is only accessible on YouTube or Vimeo. As the actual text of the poem does not appear on the web, I was unable to 'scrape' it. The other poem was contained within a Jpeg file from which I could not copy and paste. These examples served to provoke an early realisation of the inherent differences and functions not only between words on paper pages as opposed to webpages, perhaps evoking Socratic objections to the externalisation of knowledge, but also between words which have been digitised as text, and those which exist online but in other digital formats.

Going back to the original development process of {poem}.py; once I had successfully copied the text I wanted from the web, I then manually 'cleaned up' the poems, taking away punctuation, pictures or annotations to make it possible to bulk search the text through the keyword planner and generate the suggested bid prices for each word. Once I had the bid price data, I then added it all up to find out the theoretical 'value' of a poem as it exists in digital space, as opposed to the 'value' of the same poem if it were to exist only on the printed page. I then extended the commercial exchange metaphor by presenting the results as a mocked-up till receipt, thus exposing the tension between the economic and poetic value of language when mediated by and through Google's algorithmic systems. In this way I discovered that, at 4:39 PM on 7th May 2016, my favourite poem *At the Bomb Testing Site* by William Stafford cost the princely sum of £45.88 (before tax) [see Figure 2].

At the Bomb Testing Site
by William E. Stafford

SALE

7th May 2016 16:39 PM
 BATCH # 085F2
 APPR # ew7378
 TRACE # 9

3 at	E1 95
1 noon	E0 31
2 in	E0 86
6 the	E1 92
2 desert	E2 92
5 a	E2 25
1 panting	E0 02
1 lizard	E0 64
2 waited	E0 00
3 for	E0 93
1 history	E1 61
1 its	E0 27
2 elbows	E3 02
1 tense	E0 05
1 watching	E3 96
1 curve	E0 44
2 of	E0 70
1 particular	E0 03
1 road	E0 99
1 as	E0 53
1 if	E0 05
2 something	E0 30
1 might	E0 14
1 happen	E0 18
2 it	E3 92
2 was	E1 16
1 looking	E1 18
1 farther	E0 00
1 off	E1 97
1 than	E0 02
1 people	E1 35
1 could	E0 03
1 see	E0 15
1 an	E0 33
1 important	E0 30
1 scene	E0 15
1 acted	E0 00
1 stone	E0 12
1 little	E0 02
1 selves	E0 00
1 flute	E0 29
1 end	E0 08
1 consequences	E2 09
1 there	E0 65
1 just	E0 24
1 continent	E0 41
1 without	E0 53
1 much	E0 44
2 on	E1 26
1 under	E0 12
1 sky	E0 25
1 that	E0 07
1 never	E0 19
1 cared	E1 18
1 less	E1 75
1 ready	E0 56
1 change	E0 32
1 hands	E0 63
1 grpped	E0 00
1 hard	E0 05
SUBTOTAL	E45 88
TAX	E9 17
TOTAL	E55 05

APPROVED

THANK YOU FOR SHOPPING AT GOOGLE
CUSTOMER COPY

Figure 2: At the Bomb Testing Site (2016) {poem}.py

One of the first problems I encountered with this method was that once I had fed the words of a poem through the keyword planner I then had to put them back into their narrative order to make the receipt 'readable' as a downward list, as Google churns the words back out on a spreadsheet according to their frequency of search rather than in their original order. With my test poem, I had to order the words back into the shape of the poem manually, which was time-consuming and fiddly, and severely limited the scope and potential of the project. I have since been using Python code written by colleagues at Royal Holloway, Ben Curtis and Feargus Pendlebury, to automate this process. The code serves two purposes; both to strip the poetry of punctuation and repetition, thus preparing it for processing through the keyword planner, and then to reorder it back into readable narrative order once it has been monetised. This union of poetry and code is where the project title {poem}.py comes from – '.py' being the file extension for Python.

Once the code was up and running (which involved a lengthy period of debugging and discussion), I was able to convert the Google data back into narrative list order with the corresponding 'price' of each word next to it. I then added up the total cost of the poem and created a template which mirrored a paper receipt. As I played around with the receipt template, I added a CRC32 checksum hash value to the receipt as an 'authorisation code'. A checksum is a mathematical blueprint of a piece of text which is generated to ensure that a transmitted text is not altered. The sender sends the checksum with the text and the recipient generates the same checksum to make sure it has stayed the same in transit. Using this as an authorisation code on the poem receipt is therefore suggesting that when protected by code or encrypted, the poem retains its narrative integrity, but when it is decoded, it is then subject to the laws of the market – as shown on the receipt itself. At this point it might be important to note that language has always been bought and sold, whether as poetry, novels, text books or newspapers, ever since words became written down, movable, and therefore marketable. The difference I am highlighting between language that exists on the printed page and the web page, is that digitised language (or language-as-data) has become infused with a different kind of market value than paper-based print, whereby words themselves can be elevated beyond or outside both their material manifestation and their narrative function in order to create capital. That one powerful company (Google) in effect controls this process of (de)contextualisation and linguistic

valuation is why the idea of Newspeak as a means of political power is such an insightful critical tool.

The final part of the construction of the {poem}.py project was buying a second-hand receipt printer from eBay, and formatting the template to produce realistic receipts. I also added N/A to the tax field as a comment on Google's tax situation in the UK. The production of the physical receipt is an important part of my critique. Outputting the critique as old-fashioned paper receipts is my way of reclaiming poetry from the algorithmic market, and restoring its literary narrative value as a piece of art. As they pass through the {poem}.py process, words become quantifiable commodities, taken out of their poetic contexts, and reordered according to their popularity on spreadsheets populated according to quantitative, rather than poetic logics.

{poem}.py's act of resistance therefore restores the integrity of poetry in an age of linguistic capitalism. As Berardi writes, 'poetic language is the insolvency in the field of enunciation; it refuses the exaction of a semiotic debt' (2012: 22). The coded reconstruction of the poem back into its narrative order is, however, still not a total reversal of the market logic that disrupted its lyrical flow. The poem reads downwards – an unfamiliar format to human eyes – and I thought it was important to keep the format of the receipt in the way it aggregates repeated words, which has the effect that the poem tends to lose conjunctions and popular words as it progresses.

Daffodils
by William Wordsworth

SALE

February 12th 2017 11:47PM
BATCH #: CRC32
AUTH #: 2902651734
AREA #: ALL

2	i	£1.02
1	wandered	£0.13
1	lonely	£1.18
1	as	£0.33
3	a	£0.87
1	cloud	£4.73
1	that	£0.40
1	floats	£0.84
1	on	£0.41
1	high	£0.41
1	oer	£0.40
1	vales	£0.24
1	and	£0.17
1	hills	£0.49
1	when	£0.66
1	all	£0.50
1	at	£1.84
1	once	£0.06
1	saw	£0.58
1	crowd	£1.08
1	host	£3.23
1	of	£0.63
1	golden	£0.68
1	daffodils	£0.64

SUBTOTAL: £21.52
TAX: N/A
TOTAL: £21.52

APPROVED

Thank you for shopping at Google
CUSTOMER COPY
{poem}.py

Figure 3: Daffodils (2017) {poem}.py

Context

As well as an artistic statement, {poem}.py has also enabled me to shine a light on the opaque pricing system which facilitates Google AdWords, and consequently plays a part in structuring so much digitised text. As I ran more and more poems through the system, I began to realise that words relating to health, technology, litigation and finance were particularly – and sometimes inexplicably – expensive in the context of the poem, but once thought of in the context of an advert, their valuations became more obvious. The words of the poem, as they are fed through Google’s algorithmic systems, have their poetic context removed. Their value is instead imagined by the KWP in terms of their tradable worth as commodities, a system reminiscent of the novel writing machines in the Fiction Department in *Nineteen Eighty-Four*, where the literary value of language was irrelevant, and ‘books were just a commodity that had to be produced, like jam or bootlaces’ (2000: 149-150). The suggested bid price for the word ‘will’, for example, which appears frequently in many poems, including for example William Blake’s lyrics to the hymn *Jerusalem*, is relatively high in comparison with the other words around it. On 12th July 2016, when I processed the poem, it was priced at £2.06 per click (in the UK market); its value based not on the future tense of a verb, but on the legal document, and the commercial capital it might attract. Likewise, other poems I processed revealed that the words ‘break’ and ‘receding’ are expensive because of holiday adverts and hair products rather than the more poetic heartbreak and tides. William Wordsworth’s *Daffodils* is a particularly effective poem to use to illustrate these contextual mismatches, as it is such a well-known poem to most people, and because it includes the words ‘cloud’, ‘crowd’ and ‘host’ in the first stanza, all of which seem disproportionately valuable at first glance. - £4.73, £1.08 and £3.23 per click respectively on 12th February 2017 in all markets [see Figure 3]. However, the suggested bid prices of these words do not relate to how Wordsworth felt as he imagined the sky and the landscape on a spring day in the Lake District, but to the far more prosaic variants of ‘cloud computing’, ‘crowd-sourcing/funding’ and ‘web hosting’. Perhaps unsurprisingly, it seems the cost of a word to Google relates to the size and wealth of the industry it plays a part in advertising. I was also initially puzzled as to why conjunctions such as ‘he’ and ‘it’ hold commercial value, but it soon became apparent that their worth is as acronyms for ‘higher education’ and ‘information security’. Even in Latin, or indeed any

language, conjunctions and acronyms can be valuable linguistic commodities in different geographical or historical contexts. For example, the Latin word ‘uti’ in the line ‘Quando fiam uti chelidon’ (when shall I be like the swallow) in T.S. Eliot’s *The Wasteland* has a high estimated bid price because of the market around treatments for ‘UTIs’ (urinary tract infections) and the advert and click-bait heavy sites that provide (sometimes questionable) online medical advice. Not so poetic now, it seems. But what is so interesting in terms of the discursive and political effects of linguistic capitalism, is that even if you wanted to search for the Latin word ‘uti’, it is highly unlikely to be returned in that context in a Google search engine results page, purely because irritating and potentially embarrassing medical conditions earn more advertising revenue than Latin verse. Likewise, with the word ‘cloud’ in relation to Wordsworth’s cloud, or indeed the meteorological or psychological renderings of the word, if you type the word into the Google search bar, your intent is irrelevant (see also Jarrett 2014). In what is effectively a form of algorithmic governance (Rouvroy 2013, Danaher 2016), or a technologically facilitated version of the classic literary ‘intentional fallacy’, the version of the word appearing at the top of both the paid for and the organic results will always be the most commercially viable version of the word, which is not necessarily the version you intended. This is what Jobin & Glassey call Google’s power of ‘semantic determinism’, by which ‘algorithms may prevent a user’s potential search queries from escaping the lexicon with which they are familiar by suggesting words whose meanings make sense for Google’ (2014: 158). Thinking back to *Nineteen Eighty-Four*, Orwell describes a similar removal of linguistic intent in Newspeak:

The word *free* still existed in Newspeak, but it could only be used in such statements as ‘This dog is free from lice’, or ‘This field is free from weeds’. It could not be used in its old sense of ‘politically free’ or ‘intellectually free’ (2000: 344).

Just as in Newspeak, the ‘world-view and mental habits’ of the searcher are thus subtly, yet forcibly, shaped by linguistic mediation (2000: 343). A particularly stark example of this digital intentional fallacy is the word ‘guttering’ in Wilfred Owen’s *Dulce et Decorum Est*, which had a suggested bid price of £1.46 per click when I searched it in all markets on 2nd June 2016. When processed through {poem}.py, the word Owen coined to describe soldiers choking on gas in the trenches of World War

One – a beautifully constructed, wonderfully alliterative and terribly evocative mixture of ‘mud’, ‘guts’ and ‘spluttering’ – is reduced to the price of an advert for plastic drainpipes. Returning to the provocation at the start of this article, it is difficult here not to be reminded of Newspeak, a language designed to be ‘impossible to use for literary purposes’ (2000: 343).

Linguistic Geographies

As mentioned earlier, another factor in the algorithmic reckoning of the linguistic market place is location. The Keyword planner allows the potential advertiser to pinpoint specific geographic markets to hone their campaigns, as the price of keywords differs not only temporally but also by location. To illustrate this point, I began creating receipts for the same poems, but in different geographic areas, which led to some interesting observations. Although it has been argued elsewhere that the knowledge producing capacity of an algorithmic linguistic market is corrupted by Google’s constant interference in the system (Thornton & Danaher 2018), there are some interesting cultural and political reflections in the data gleaned from the Keyword planner. At a conference in Ireland I had asked the chair to provide me with a favourite poem to print out and use as an illustrative example of the geographic fluctuations of price in AdWords. I processed the chosen poem, Sylvia Plath’s *The Arrival of the Bee-Box*, through {poem}.py in three geographically decreasing market areas: firstly, all markets, then the whole of Ireland, and then Galway City, which is where I was giving the talk. Whereas as a general rule, words are worth less in smaller geographical areas (thus reflecting a smaller market), I noticed that the word ‘god’ in the Plath poem was worth almost three times more in Galway (£1.74 PPC) than in the whole of the AdWords market (£0.66 PPC). This is despite the fact that the poem as a whole was worth less in Galway than in the wider market. It seems ‘god’ is still a lucrative marketing tool in Catholic Ireland. Another interesting example in the {poem}.py data is the word ‘lonely’, which seems always to be worth more in urban environments than in rural ones. This perhaps reflects existing research that people are lonelier in cities than in the countryside, and that dating sites targeting ‘lonely’ singletons have more competition in urban areas, thus driving up the price of the keyword. Aside from the process of producing the poem/receipts, I have also been

gathering the suggested bid prices for over a thousand words every day since June 2016. Each of these words have been valued by the KWP in the UK, US and in all geographical markets. Some of these words belong to poems or texts which I thought threw a kind of linguistic net around a particular event or subject, such as the lyrics to Billy Bragg's *Between the Wars*, which includes politically relevant words such as 'voting', 'government', 'austerity' and 'prosperity', or Margaret Atwood's *It is Dangerous to Read Newspapers* which describes the immersive terror of reading about war, bombings and atrocities in the media. With this data, I can plot the price of whole poems on a geo-temporal scale, for example showing the price of Alan Ginsberg's poem *America* (in the US and other markets) throughout the buildup and aftermath of the US presidential election [see Figure 4].

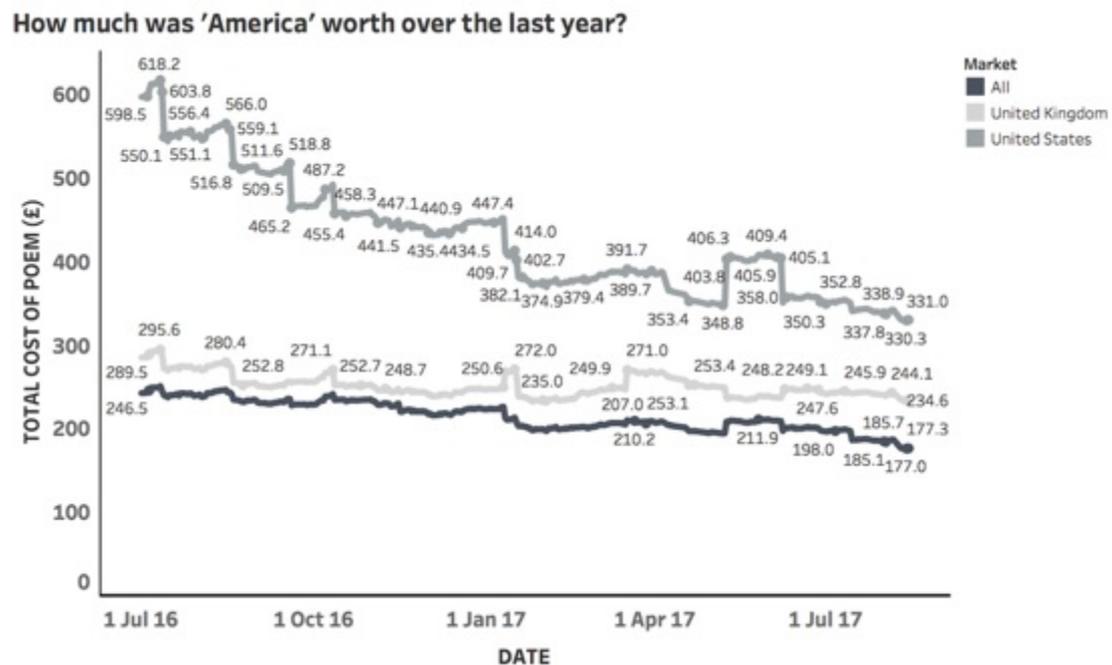


Figure 4: Suggested bid price (£) for complete text of Alan Ginsberg's poem *America* from 1 July 2016 to 31 May 2017 in US, UK and ALL Google AdWords markets {poem}.py

But as well as showing the imagined 'value of America' over a politically turbulent time as an artistic statement/intervention, I can also track the trajectory of the individual words within the poems. In addition, I have been gathering the suggested bid prices of another group of words as part of a 'word cloud' made up of words likely to appear in online texts and the media, such as 'trump', 'blair', 'clinton',

‘snowden’, or ‘brexit’, so am able to map their suggested prices against world events on a geographical timeline. Although I will have to leave full analysis of this data to another paper, initial findings show how the word ‘chilcot’ achieved monetary value shortly after the Iraq Inquiry was released on 6th July 2016, going from £0.00 to £1.86 in a period of 7 days. Likewise, the words ‘wags’ (as in wives and girlfriends), went from zero to £5.44 per click in the UK market 6 days after the start of the 2016/17 Premier League football season. If it is surprising that such ostensibly unmarketable words have money generating potential in the digital advertising market, then we might look to the 2017 UK general election, when political parties, think tanks and charities found themselves competing on AdWords for keywords such as ‘brexit’ and ‘dementia tax’ (Thornton 2017b, 2017c).

What is important to remember in all this is that lucrative and effective keywords, no matter what their other contexts, or the intent of those who search for them, are more likely to be used in the language which exists on and flows through online spaces, whether this is in AdWords advertising, in organic optimised text, or in the sites that carry lucrative adverts. Their repeated use by advertisers and confirmatory clicks by users, along with the encouragement of the Google community in the form of SEO help pages and forums, serves to increase their frequency within the wider database, and this is a process which I argue has an important effect on the subsequent information generated by Google functions such as Search, Autocomplete, and even Google Translate (Thornton 2017a). As keywords and optimised text become the rules by which online language is organised, it follows that in a world increasingly mediated by Google platforms and infused with the neoliberal logic of the marketplace, language which is non-normative, original, or creative becomes less prominent in the corpora of words available to Google’s algorithms. Like Orwell’s Newspeak, the SEO industry is in effect ‘cutting language down to the bone’ (2000: 59). An important SEO tactic is to recycle content, to reblog or rehash the already popular. Optimised text is rarely original, or new, or it simply would not perform its function of being easily found. With the {poem}.py project I have reversed this performative logic (Lyotard 1984) of language by reclaiming poetry from the algorithmic marketplace, repoliticising it, and turning it back into art (Benjamin 2008).

provocation in that sense becomes part of the intervention; art imitates life, and is turned back to art again. As Feuz et al. say, it may be almost impossible to ‘study a distributed machinery that is both willfully opaque and highly dynamic... one, which reacts to being studied and takes active steps to prevent such studies being conducted on the automated, large-scale level required’ (2011). Google does all these things, so what I have done with {poem}.py is to accept these barriers as important pieces of the jigsaw. I do not have access to the black-boxed workings of Google’s algorithmic platforms, but I can see (and show) what goes into the search portal, and what comes out the other side. My receipt printer in this way takes on the role of the black box [see Figure 5], exposing the contextual transitions of language, while at the same time embracing the performative logic of linguistic capitalism via the material aesthetics of print on paper. This has meant working with (rather than against) the idiosyncrasies of the system to expose its underlying logics; discovering not only what they can tell us about the world, but also what part they play in constructing the narrative, and infusing cultural and political discourse with the neoliberal logic of the linguistic market in a way unimaginable before the modern digital age.

It is of course an unprovable curiosity that - in theory - Orwell’s *Nineteen Eighty-Four* could earn Google £58,318.14 each time it passes through one of its algorithmic portals [see Figure 6], but it is a point I think needs making. In processing Orwell’s text through {poem}.py, I am of course executing a double-flanking critical manoeuvre against the political and linguistic consequences of linguistic capitalism; highlighting the power of Newspeak (both as described by Orwell and as deployed in a contemporary context), while also exposing the similarly ‘Orwellian’ authoritarian power that Google has today by virtue of its control over the commodification and exploitation of language. Although all kinds of data are monetised in the modern digital economy, exposing the potential consequences of the monetisation and manipulation of linguistic data is especially important not only because of the fundamental role language plays in our everyday lives as a means of communication and expression, but also in the politics and power relations it embodies. As I mentioned earlier, and as incisively imagined by Orwell, language is power, and those who control it – by whatever means – hold an extraordinary amount of influence over both people and places. In an age of linguistic capitalism, our very means of communication has been compromised by the all-pervasive, yet opaque, logics of the

algorithmic neoliberal market. The provocation and intervention described in this article are therefore my attempt to shine a light on Google's algorithmic and economic distortions of language, resisting (and subverting) linguistic capitalism by harnessing and mobilising the innate power of language, using poetry and literature to do so.

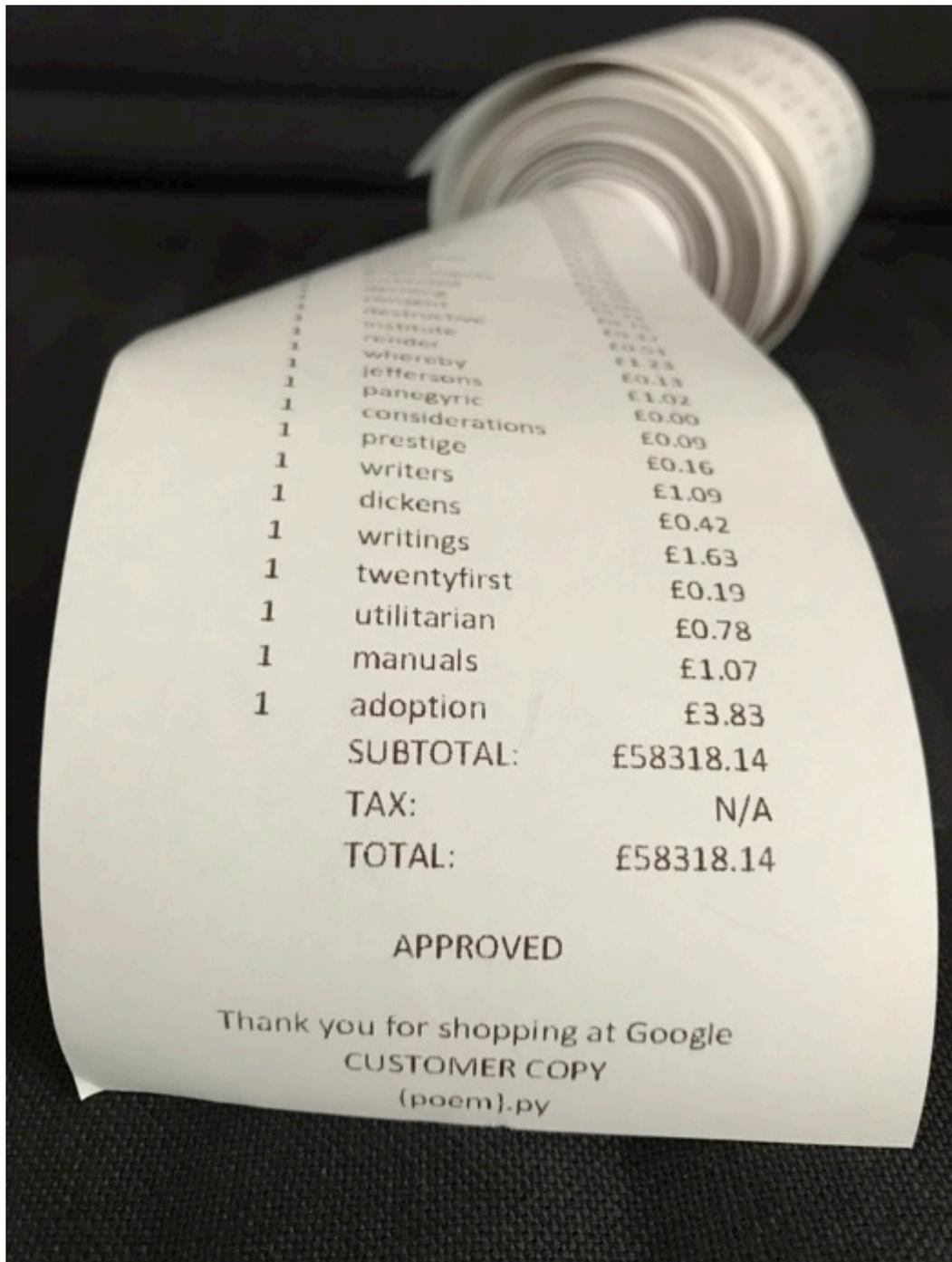


Figure 6: poem/receipts – 1984 (2017) (end), {poem}.py (photo author's own)

Acknowledgements

This project would not have been possible without the technical and moral support of the Royal Holloway Centre for Doctoral Training in Cyber Security and its student, staff and honorary members, in particular Ben Curtis, Feargus Pendlebury, Keith Martin, Pete Adey and Chris Bewick. Special thanks to Andrew Dwyer, Nick Robinson, Andreas Haggman and John Hogan Morris, who have listened to and commented on more versions of this paper than they deserve, to the anonymous reviewers, and to everyone who supported and interacted with the project over the last two years. I apologise for ruining your favourite poems.

References

- Atwood, M. (1984). It Is Dangerous To Read Newspapers. *Both Sides Now: The Poetry of the Vietnam War and Its Aftermath*.
- Battelle, J. (2011). *The search: How Google and its rivals rewrote the rules of business and transformed our culture*. Nicholas Brealey Publishing.
- Benjamin, W. (2008). *The work of art in the age of mechanical reproduction*. Penguin UK.
- Benzon, P, & Sweeney, S. (eds), (2015) The aesthetics of erasure, guest editorial statement *Media-N Journal*, 11(1).
- Berardi, F. (2012). The uprising: On poetry and finance. *MIT Press Books*, 1.
- Bragg, B. (1985). *Between The Wars*. Chappell Music.
- Brin, S., & Page, L. (2012). Reprint of: The anatomy of a large-scale hypertextual web search engine. *Computer networks*, 56(18), 3825-3833.
- Bruno, C. (2002). The Google AdWords Happening.

Bruno, C. (2012). The Work of Art in the Age of Meta-Capital. In *Drunk on Capitalism. An Interdisciplinary Reflection on Market Economy, Art and Science* (pp. 143-157). Springer Netherlands.

Cabell, M., & Huff, J. (2013). *American psycho*.

Danaher, J. (2016). The threat of algocracy: reality, resistance and accommodation. *Philosophy & Technology*, 29(3), 245-268.

Diaz, A., (2008). Through the Google goggles: Sociopolitical bias in search engine design. *Web search*, pp.11-34.

Eliot, T. S. (2010). *The waste land and other poems*. Broadview Press.

Ellis, B. E. (2016). *American psycho*. Robert Laffont.

Feuz, M., Fuller, M., & Stalder, F. (2011). Personal Web searching in the age of semantic capitalism: Diagnosing the mechanisms of personalisation. *First Monday*, 16(2).

Foxtrot, J. (2015) Bog Eye Man. <https://vimeo.com/117173388>

Fuchs, C. (2011). A Contribution to the Critique of the Political Economy of Google. *Fast Capitalism*, 8(1), 1-24.

Gillespie, T. (2014). The relevance of algorithms. *Media technologies: Essays on communication, materiality, and society*, 167.

Ginsberg, A. (2008). Other Poems. *Twentieth-Century American Poetry*, 219.

Golumbia, D. (2009). *The cultural logic of computation*. Harvard University Press.

Granka, L. A. (2010). The politics of search: A decade retrospective. *The Information Society*, 26(5), 364-374.

- Hayek, F. A. (1945). The use of knowledge in society. *The American economic review*, 519-530.
- Introna, L. D., & Nissenbaum, H. (2000). Shaping the Web: Why the politics of search engines matters. *The information society*, 16(3), 169-185.
- Jarrett, K. (2014). A database of intention?. *Society of the query reader: Reflections on Web search*. Amsterdam: Institute of Network Cultures, 16-29.
- Jhally, S. (2012). The factory in the living room <https://vimeo.com/36491486> accessed 18th July 2017
- Ji, F. (2004). *Linguistic engineering: Language and politics in Mao's China*. University of Hawaii Press.
- Jobin, A., & Kaplan, F. (2013). Are Google's linguistic prosthesis biased towards commercially more interesting expressions? A preliminary study on the linguistic effects of autocompletion algorithms. In *Conference Abstracts*. Center for Digital Research in the Humanities, pp. 245-248.
- Jobin, A. and Glassey, O. (2014), "I am not a web search result! I am a free word": the categorization of 'Switzerland' by Google", in Köning, R. and Rasch, M. (Eds), *Society of the Query Reader: Reflections on Web Search*, Institute of Network Cultures, Amsterdam, pp. 149-162.
- Kaplan, F. (2014). Linguistic capitalism and algorithmic mediation. *Representations*, 127(1), 57-63.
- Kaplan, F. (2011). Vers le capitalisme linguistique: Quand les mots valent de l'or. *Le Monde diplomatique*, (692), 28.

Kitchin, R. (2017). Thinking critically about and researching algorithms. *Information, Communication & Society*, 20(1), 14-29.

Lorde, A. (2012). *Sister outsider: Essays and speeches*. Crossing Press.

Lyotard, J. F. (1984). *The postmodern condition: A report on knowledge* (Vol. 10). U of Minnesota Press.

Mager, A. (2012). Algorithmic ideology: How capitalist society shapes search engines. *Information, Communication & Society*, 15(5), 769-787.

Mahnke, M., & Uprichard, E. (2014). Algorithming the algorithm. *Society of the query reader: Reflections on Web search*. Amsterdam: Institute of Network Cultures, 256-271.

Marczewska, K. (2015). Erasing in the algorithmic extreme: Mimi Cabell and Jason Huff's 'American Psycho'. *Media-N Journal*, 11(1).

Nixon, B. (2016). The old media business in the new: 'the Googlization of everything' as the capitalization of digital consumption. *Media, Culture & Society*, 38(2), 212-231.

Noble, S. U. (2018). *Algorithms of Oppression: How search engines reinforce racism*. NYU Press.

Orwell, G. (2000). *Nineteen eighty-four*. Penguin Classics.

Owen, W. (1995). *Dulce et decorum est*. University of Virginia Library.

Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Harvard University Press.

Pasquinelli, M. (2009). Google's PageRank algorithm: A diagram of cognitive capitalism and the rentier of the common intellect. *Deep search*, 3, 152-162.

Plath, S. (2010). *Ariel: The restored edition*. Faber & Faber.

Rouvroy, A. (2013). Algorithmic Governmentality and the End (s) of Critique. *Society of the Query*, 2.

Shaw, J. and Graham, M., (2017). An Informational Right to the City? Code, Content, Control, and the Urbanization of Information. *Antipode*.

Thatcher, J., O'Sullivan, D., & Mahmoudi, D. (2016). Data colonialism through accumulation by dispossession: New metaphors for daily data. *Environment and Planning D: Society and Space*, 34(6), 990-1006.

Thornton, P., Danaher, J. (2018). On the wisdom of algorithmic markets: governance by algorithmic price (under review)

Thornton, P., (2017a). Geographies of (con)text: structure and language in a digital age. *Computational Culture*, Issue 6.

Thornton, P. (2017b). Buying Brexit: the politics of google ads and the general election. *Geopolitics and Security*. Available at:

<https://rhulgeopolitics.wordpress.com/2017/05/30/buying-brexit-the-politics-of-google-ads-the-general-election/> (accessed 26 April 2018).

Thornton, P. (2017c). How the Tories wrote my thesis: the political economy of a large scale hypertextual web search engine. *Linguistic Geographies*. Available at: <https://linguisticgeographies.com/2017/05/30/how-the-tories-wrote-my-thesis-the-political-economy-of-a-large-scale-hypertextual-web-search-engine/> (accessed 26 April 2018).

Van Couvering, E. (2010). *Search engine bias: the structuration of traffic on the World-Wide Web* (Doctoral dissertation, The London School of Economics and Political Science (LSE)).

Wordsworth, W. (2005). Daffodils. *Hastings W.-Nw. J. Env't'l L. & Pol'y*, 12, 33.

Zook, M. A., & Graham, M. (2007). The creative reconstruction of the Internet: Google and the privatization of cyberspace and DigiPlace. *Geoforum*, 38(6), 1322-1343.

Figures

Figure 1: poem/receipts – 1984 (2017) (start), {poem}.py (photo author's own)

Figure 2: At the Bomb Testing Site (2016) {poem}.py

Figure 3: Daffodils (2017) {poem}.py

Figure 4: Suggested bid price (£) for complete text of Alan Ginsberg's poem *America* from 1 July 2016 to 31 May 2017 in US, UK and ALL Google AdWords markets {poem}.py

Figure 5: {poem}.py receipt printer / black box (photo credit: Amy Freeborn 2018)

Figure 6: poem/receipts – 1984 (2017) (end), {poem}.py (photo author's own)

Author Biography

PIP THORNTON is a PhD candidate in the Centre for Doctoral Training (CDT) in Cyber Security & Geopolitics at Royal Holloway, University of London, Egham TW20 0EX, UK. Email: pip.thornton.2013@live.rhul.ac.uk. Her research interests are in language in the age of algorithmic reproduction and the politics and aesthetics of digital technology.