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Interdisciplinary notes on research and practice relating to the digital in culture and society, as well as computers in the arts, humanities and social sciences.

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Issue 1, April 2023

The Big Knowledge Reset and Its Impact on Digital Humanities
Domenico Fiormonte, University of Roma Tre

Data Feminism by Catherine D'Ignazio & Lauren F. Klein
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Systems Interference: Arguments, Samples, New Work
Micheál O'Connell, University of Sussex

Humanidades Digitales: infraestructuras visibles e invisibles
Gimena del Rio Riande, IIBICRIT, CONICET Argentina

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COMPUTERS & CULTURE (ISSN 2990-8000) is an interdisciplinary digital pamphlet featuring short essays and notes of relevance to the Digital Cultures, New Media, & Cultural Analytics research cluster housed within the Future Humanities Institute at University College Cork.

Submissions are welcome from across all disciplinary perspectives, and suitable topics include, but are not limited to, the ways in which contemporary culture and society are increasingly mediated through and dictated by software systems and digital platforms; computers and the changing nature of expression, communication, and language; digital art and performance; humanity, posthumanism, and the self in this age of machines; and the influence and application of data, information, and quantitative methods in the wider arts, humanities, and social sciences.

Rather than full-length research articles which would be better suited to peer-reviewed journals and book publications, *Computers & Culture* provides a space for shorter scholarly provocations, position papers and opinion pieces, practice-centred essays, research notes, brief accounts of projects or experiments, and book or project reviews.

For further information on *Computers & Culture*, see:
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While contributions from researchers based at or affiliated with UCC are particularly welcome, *Computers & Culture* is open to submissions from all individuals and research teams, regardless of their career stage or institutional affiliation.

Submission should adhere to the following process:

1. Submissions should be appropriately framed by relevant scholarly contexts and the state-of-the-art, but, where possible, should also appeal to a general audience.
2. Submissions should be a maximum of 5,000 words (this is not inclusive of notes and references), though shorter pieces are preferred. There is no advisory on the minimum length of submissions.
3. If using notes, footnotes are preferred to endnotes.
4. While submissions may conform to any consistent citation style, Chicago (author-date) is preferred. Reference lists should only include in-text citations.
5. Submissions should be sent in .docx format only.
6. Submissions should be sent by e-mail to the editor at james.osullivan@ucc.ie

Brief reviews are carried out by a small editorial board. The submission window remains open year-round. Potential contributors are welcome to discuss possibilities with the editor, Dr James O'Sullivan, in advance of submission.

Note from the Editor

Computers & Culture responds to a gap in the publishing landscape for the arts, humanities, and social sciences—some notable exceptions aside, there are few venues in which researchers can place knowledge contributions unsuited to traditional journals and volumes of collected essays.

Peer-reviewed publishing—which provides the conditions necessary for significant advances in a discipline's state-of-the-art—will always remain the essential site of the science of our time. But there must also be room for the "B-side" material, the opinion pieces, the unpolished features on a personal perspective, the minor and failed (but nonetheless interesting) experiments. This is particularly important in emerging, interdisciplinary fields and practices, where speculations on theory and methodology should be afforded the opportunity to happen in public.

In my own field, the digital humanities, it is becoming increasingly difficult to publish the results of a computer-assisted analysis unless the corpus is considered sufficiently "big", the methodology novel, and the interpretations revolutionary. There seems little room left for publishing analyses which confirm the expected, or for initial, exploratory analyses which lay the foundation for more complete studies by future peers. Journals want the major, groundbreaking studies, with everything else relegated to local hard drives, never to be read.

There was a time when academic blogs—either personal or institutional—filled this gap. But "blogging" as a practice is largely dead. Some noteworthy institutional projects still exist, such as *Talking Humanities*, published by the School of Advanced Study at the University of London, but such initiatives are really only blogs from a platform perspective. Most institutional "blogs" are closer to traditional publishing practices than they are blogging; such endeavours are markedly different from what we think of as the individual academic blog. While the ideals of academic blogging were sound, the practice failed to reckon with the need for scholars to have their written outputs "count" as professional capital, as well as the inability of most individuals to preserve their own knowledge (particularly knowledge which doesn't "count").

Many in the digital humanities will be aware of Scott Weingart's original scottbot.net, Ted Underwood's The Stone and the Shell, or Miriam Posner's blog (the latter two sites are still semi-active). These resources, by offering expert yet succinct and intuitive treatments of complex topics, have made a significant contribution to the formation and development of the computational humanities and social sciences. It is not an embellishment to state that there was a time when many of us in DH understood network analysis because of Scott Weingart's blog posts on the subject.

Of course, the substantial, peer-reviewed work published by such figures is where the richest material is found, but it nonetheless remains a shame that the B-sides often go without sufficient recognition. Blogs simply do not count as publications (and there are good reasons for that), but the stuff on blogs can often be as valuable as that which is considered "published". Worse still, personal blogs are rarely preserved beyond the Wayback Machine, and all that knowledge and perspective is becoming lost to obsolescence.

Computers & Culture seeks to provide a space for scholars and practitioners to publish things which, while unsuited to fully-fledged journal articles or book chapters, their peers should nonetheless know. It is a place to share the B-Sides so that they count, and a place where these "lesser" pieces can be preserved into the future through deposit to the Cork Open Research Archive (CORA).

James O'Sullivan
Founding Editor

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The Big Knowledge Reset and Its Impact on Digital Humanities[1]

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Translated into English by Desmond Schmidt

In November 2020 a group of Italian academics published an open letter on the irruption of digital proprietary platforms in university education (Mirrlees & Alvi, 2019; Yu & Couldry, 2020).[2] All of the risks mentioned in that letter regarding the technological empire of GAFAM (Google, Apple, Facebook, Amazon and Microsoft) have, in less than two years, now come to pass. For example, Facebook surreptitiously entered the education market by offering services for "teaching support" to Latin American universities,[3] just as Google had already tried to offer courses at laughable prices in order to corner the schools market in Europe and India. In the latter case, in partnership with Byju's, it offered "personalized education", facilitating the transition from the traditional classroom to a virtual learning space.[4] However, the more worrying, perhaps secondary, effect of this process of digitalization of learning, is the emergence of "surveillance services" for supervising online exams (Vattikonda and Edelson, 2020). After the Respondus case (Lawson, 2020) and the problems generated by proctoring software in general (Brown, 2020), a recent report from the Center for Democracy and Technology revealed that applications installed on student devices were being "used for discipline more often than for student safety" and that "teachers report that it is more frequently used for disciplinary purposes in spite of parent and student concerns" (Laird et al., 2022).

The Italian Context

In Italy, as a result of agreements reached with the CRUI (Conference of Italian University Rectors) during the pandemic of COVID-19, Microsoft began to supply all universities in the country with the Teams environment, for use as a digital platform for holding classes and staff meetings online. This software is distributed with its trademark office suite, the same one offered to all those businesses that had once bought the now infamous Microsoft Productivity Score, a productivity-tracking tool that automatically assigned scores to employees, based on their performance at work. After several protests, the American company decided to withdraw it or, rather, to make it less intrusive. But all the harmful functionalities in its original design still remain in the background (Tung, 2022), waiting for the right moment to reactivate.

Always at the forefront of dystopian solutions, Microsoft has now announced the launch of Reflect, an application that allows the educational community – according to its website – "to send and respond to surveys designed to support learning, and emotional and social well-being".[5] It is not yet known what psychologists will say on that last point, but everything that has already been rejected by companies in the use of Productivity Score, is now being reformulated for the education

[1] A previous version of this article has been published in Spanish: https://revistas.unlp.edu.ar/publicaahd/article/view/14456

[2] The letter was previously translated and published in multiple languages: http://theoreti.ca/?p=7684 (English), https://academia.hypotheses.org/28825 (French), https://dhd-blog.org/?p=14666 (German), https://medium.com/@leofn3/por-que-a-universidade-de-plataforma-%C3%A9-o-fim-da-universidade-ccad69752bcf (Portuguese).

[3] For example: https://www.unc.edu.ar/campus-virtual/la-unc-y-facebook-inscriben-para-el-programa-para-universidades-facebook-blueprint

[4] See https://www.epw.in/journal/2022/1/perspectives/edtech-leviathan.html

[5] Accessible from https://support.microsoft.com/en-us/topic/get-started-with-reflect-in-teams-e9198f62-7860-4532-821f-53ef14afa79a

system, allowing Microsoft to collect extremely sensitive data, and permitting the management teams of schools to monitor the moods of teachers and students.

It is interesting to point out how the members of GAFAM, operating as a cartel, try not to compete too much among themselves. However, the business of education is still very tempting. So much so that Amazon, after relaunching in European several countries its initiative "one click for school",[6] in 2020, then added Digital Lab, "a free digital space that offers an extensive catalog of resources", including videos and other content for teachers.[7] And as for Apple, the Italian Ministry of Education has already undertaken to include them in the education business, by signing in November 2020 an agreement that, according to its action plan, aims to promote initiatives that search for ways to support didactic and pedagogic innovation, developing solutions that seek to modify traditional learning environments and encourage the exchange of information and content, and so meet the educational needs of teachers.[8]

In the case of universities, the following Minister for Research and University, Gaetano Manfredi, said nothing for the ten months it took the CRUI to renew its agreements with Microsoft. All this happened in spite of the existence of free and open-source tools such as those offered by GARR (Group for the Harmonization of Research Networks),[9] in which the government has not invested a single euro.

Education in the Hands of Knowledge Oligopolies

It should be clear by now, that if governments fail to expend resources on training its population, others will do it for them. In Brazil it was revealed that the American multinational distance education company Laureate, with headquarters throughout the world, used artificial intelligence software to correct the texts of its students. However, distance learning was already a major industry in Brazil even before the pandemic, with some two hundred thousand students enrolled in different universities. In 2021, during the World Social Forum seminar on the "University of Platforms" , Gabriel Teixeira, professor at the Federal Institute of Rio de Janeiro, explained how, following a complaint submitted to a Brazilian court, he was summoned as a witness, and in his testimony he showed photographs of the call center where he carried out his work. In fact, some teachers present their courses to groups of up to twenty thousand students, a figure not far short of all those enrolled in the University of Pavia, one of the oldest in Europe.

Obviously, in all the cases mentioned so far, the data collected by Google, Microsoft, Facebook or other Big Tech companies will also presumably serve to connect students with the world of work. Soon we will see diplomas made to measure for each person. The tailor will be artificial intelligence that will create the perfect suit for each individual, from the cradle to the grave. Physically attending school or university will for many become superfluous. GAFAM will think about training, GAFAM will think about hiring, in the same way that GAFAM has always structured the margins of information, relationships, consumption and desires. In accordance with this vision, universities and schools will not disappear (for the moment), but they will gradually be able to do without some of their contracted teachers, as in the case of a Canadian university, where a dead professor taught,[10] or the dangerous

[6] A Spanish initiative similar to the now withdrawn AmazonSmile program.
[7] Accessible from https://www.unclicparaelcole.es
[8] More information on Apple Learning Coach: https://www.apple.com/la/newsroom/2022/03/apple-announces-new-coaching-program-for-educators/

[9] See for example the BlueMeet software offered free to all public research institutions: https://meet.garr.it/
[10] One of the many copies of this news: https://translate.google.com/translate?hl=en&sl=es&tl=en&u=https://actualidad.rt.com/actualidad/381909-profesor-

precedent set by the labor force adjustment plan of the European University of Madrid, which allowed it to dismiss a significant number of its teaching staff[11]. Wherever nature fails, governments will put forward their solutions, and in places like France or Greece, are already working to introduce legislation that could make protests illegal in universities.

The consequences of the health crisis and now of the war in Ukraine will speed up agreements between GAFAM (and possibly also Huawei or Alibaba) and public education. Mixed and partly off-campus teaching is becoming the norm in all those countries that either do not want, or simply cannot invest in, face-to-face education, as demonstrated by the case of Peru[12] and other countries of the Global South. The universities, assuming that they still retain the legal ability to grant qualifications, may certify titles awarded by or with GAFAM or – and this amounts to the same thing – the weaker universities could begin to play a more dignified role as certifiers of content, mostly supplied through Big Tech consortia. It will be these companies, in alliance with large global educational publishers, such as Pearson[13], who will provide the content, based on the synergy between artificial intelligence and everything accumulated in previous years thanks to the ignorance – or arrogance – of schools and universities. They will also be the ones who fund the salaries of teachers, or those still living, as already happens in the infrastructures and platforms created by publishing multinationals, whose aim is to manage all the phases of research, from data collection to publication. The State, agile at last, throughout this process will provide logistical support, tax deductions, etc. However, if you prefer a "heavier" state model, you can always choose the Chinese one. Welcome to the Geopolitics of Knowledge (Fiormonte, 2017; Reiter, 2018), and the epistemic injustices it entails (Fricker, 2007).

In this scenario there have been a few dissonant voices. The French philosopher Barbara Stiegler (2021), in a pamphlet, accused the French government of using the pandemic as a pretext for bringing the public education system to its knees. And Karen Maex, Chancellor of the University of Amsterdam, called for laws to protect universities from the aggressive tactics of Big Tech[14]. The chancellor seems to have understood what most university managers ignore – or, perhaps, pretend to ignore – that digital platforms are not just tools to help us do our job during this or that emergency; they are the competition. They do not offer us a service – they are robbing us in our very homes. This form of neocolonization, or self-colonization, merits further reflection. Either the university rectors and managers, in addition to not worrying about the privacy of their students, are irresponsible, and should therefore resign en masse, or they are perfectly aware of the consequences of using those platforms. This would mean that they are also allowing GAFAM to do the dirty work of promoting, by natural selection, a model of first class universities with face-to-face education for the élites, and another second or third class education that is public and online, for everyone else. As Barbara Stiegler suggested, the question goes far beyond mere distance education. To promote teaching that is partly or totally online is nothing more than a way of shutting down what is regarded as unnecessary or wasteful.

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universidad-canada-continuar-clasis-to-die-2019

[11] See El País: https://translate.google.com/translate?hl=en&sl=es&tl=en&u=https://elpais.com/educacion/2021-02-04/el-primer-ere-a-profesores-universitarios-moviliza-a-las-administraciones.html

[12] See https://otrasvoceseneducacion-org.translate.goog/archivos/392478?_x_tr_sl=es&_x_tr_tl=en&_x_tr_hl=en

[13] See https://web.archive.org/web/20220630225828/https://middleeast.pearson.com/Aboutus/News/2022/04/pearson-reveals-the-technology-trends-that-will-disrupt-higher-education-in-2022.html

[14] See https://www.universityworldnews.com/post.php?story=20210115122001617

The ultimate target of this destructive process, that comes from afar, is us, the teachers, and the subversive relationship, though tattered, fragmented and endangered, we seek to build with our students. It is this bridge that they want to permanently destroy.

Epistemic and Biocultural Diversity and Digital Humanities

So what is the impact of this "big reset" on Digital Humanities (DH)? Unfortunately, in all aspects we have analyzed so far, DH, with few exceptions, has missed a great opportunity to exercise its critical muscle (del Rio Riande and Fiormonte, 2022). It is true that its origins are not culturally and politically neutral (Jacob, 2021; Jones, 2016)[15], but especially from the 1980s, DH was able to offer an original perspective on computing tools, for example by initiating a fundamental reflection on the epistemological role of digital representation, that is, on encoding (Fiormonte, 2018, pp.10-13). Although, as humanists, it would have been natural for us to think that the passage from analogue to digital would be a neutral process, in those years we began to realize that, like all changes in medium or format, digital representation was able to change and influence both the life of the original object and that of its digital surrogate. We discovered – to use the terminology coined by the Canadian economist Harold Innis (2008) – the multiple biases inherent in the media of knowledge representation. This perspective could have been useful in preventing the health emergency from turning into a victory for private platforms. What was missing was an awareness of the implications and geopolitical impact of the production of knowledge and the inequalities it introduced on a global level. But the international DH community remained silent about the enormous damage being done by the Big Tech oligopolies. Today, faced by the great transformations of surveillance capitalism, DH seem paralyzed on the one hand by a pragmatism of survival, and on the other by a desire to embrace technology in a politically correct way. Is it too late to convert the hermeneutic and epistemological drive of the digital humanist into political awareness? The problem is that ignoring the nature and implications of these transformations could bring about the disappearance of the Humanities, and probably also of the university as a whole. The risk is that the entire process of platformizing education, knowledge, expertise, etc. brings with it an end to education as it has been conceived and practiced (well or poorly), and to its relationship with the masses and the elite, over the last five hundred years.

The current biopolitical domain exists in the form of digital knowledge, mediated by representations – after all, the digital medium is a language of representation – by data, algorithms that process data, software that incorporates algorithms, AIs that add software, etc., and although they are false and manipulated,[16] they are nevertheless directed towards the domain of the mind and the mastery of subject matter. And, in the midst of this garden, the Big Tech companies, led by Amazon and Microsoft, are also landing in the field of so-called agribusiness. FIAN International, an organization that has worked for the right to food and nutrition since 1986,

[15] Steven Jones (2016) recalls that, in the midst of the Cold War, Busa contracted with EURATOM for the financing of the IBM Linguistics laboratory at Georgetown University, which worked on the automatic translation of Russian texts. On the other hand, Arun Jacob analyses how the punch card developed in Germany by a subsidiary of IBM "was instrumental in the Nazi administrative efforts to ... coordinate and conduct a comprehensive surveillance program" (Jacob, 2021, pp. 133-134) and concludes in his essay: "[DH] scholars must have the moral courage to recognize that the field is complicit in the birth of surveillance capitalism, military contracting, and the technological apparatus of the security state" (Jacob, 2021, p. 139).

[16] See https://www.washingtonpost.com/technology/interactive/2023/ai-chatbot-learning/

has published an analysis showing how digitalization of land (land registries, etc.) reproduces or aggravates the marginalization of rural communities, undermining the subsistence economy of millions of people in Brazil, Rwanda, India, Georgia, Indonesia, etc.[17] A similar study published by the NGO Grain.org reveals that digital platforms are seeking to take over every point and stage in the process of the production, distribution and consumption of food.[18] Software provided by Monsanto-Bayer, Syngenta, BASF or Verizone, etc., offer farmers assistance in the different phases of their work, providing real-time information on the weather, advising when and what to sow, or when to use a herbicide, but also recommending which tractor or which drone to buy. In exchange for all these services, Big Tech companies get mountains of data from farmers' digital devices. The ultimate goal is obviously total control of the food chain. Therefore, digital knowledge will tell us what to buy (and with what currency), what to eat, what to see, what to read and study, how to dress, where to go on vacation, how to heal ourselves and, obviously, who to vote for. In reality, thanks to the immense concentrations of property and multinational finance (Vitali, Glattfelder and Battiston, 2011), our universal masters, the Big Tech companies, have almost found solutions to all of these problems. Perhaps all that remained was to overcome the obstacle of a school or university that still posed some kind of threat.

The only problem was how to slow down and contaminate the process that Gramsci, in talking of culture, called "the conquest of a superior consciousness" and "its own sense of value in History" (Gramsci, 1997, p. 1). The goal of GAFAM is to control and shape education, information and research in the same way that many goverments since the 1930s have done. As Gramsci believed, culture was a key factor in the political and economical empowerment of the masses. But the promotion of the new digital platforms is now turning this "cultural hegemony" into a global phenomenon.

Our only hope is what has been called biocultural (Maffi, 2001) and epistemic diversity, which is both the greatest enemy of platformization and the most powerful weapon we have to counter it. In fact, the Achilles heel of the epistemological and geopolitical model of algorithmic governance is the fact that its predatory mechanism is also its main objective (Pinto, 2019). In other words, the risk in trying to control diversity by starving it to death, or reducing it to its minimum expression, is to be, in turn, overwhelmed by it. It is well known that those who promote universalization tend to fear chaos. Therefore, to cultivate both biocultural diversity and technology, on a local and global level, means not only resisting the homogenization of digital platforms, but also defeating their logic. "The essence of the different types of flowers is expressed in their diversity, although this leads to cross-fertilization between them", wrote the great poet, novelist and African essayist Ngũgĩ wa Thiong'o (1993) on the relationship between European and African languages. The earth generates life and becomes involved in its history: "all the great national literatures have taken root in the culture and language of the peasants" (p. 22). The core of diversity, and the repudiation of digital platforms, lie in variation and redundancy, characteristics of the "multi-diversity intrinsic to living matter". These are the words of the Italian biologist Marcello Buiatti (2004), in a beautiful and multifaceted book dedicated to the complex relationship between biology and culture, written in the same year that Facebook was born. Similar reflections have long been gaining ground in the field of social sciences,

[17]See https://www.fian.org/files/files/FIAN_Research_Paper_Digitalization_and_Land_Governance_final.pdf
[18]See https://grain.org/en/article/6595-digital-control-how-big-tech-moves-into-food-and-farming-and-what-it-means#gallery-3

such as the *pluriversity* of Arturo Escobar (2014), or the *epistemology of the margins* of Boaventura de Sousa Santos (2015). This plurality can and should also apply to the field of digital technologies, as demonstrated by the birth of movements in cases where scarcity is not only synonymous with resilience[19], but is also an opportunity to put into practice mechanisms such as the community networks that emerged in Latin America during the pandemic[20]. It is no coincidence that the most innovative and radical proposals in the field of digital network governance come from groups in the Global South, as evidenced by the manifesto for digital justice promoted by the Just Net Coalition, an international network of experts, activists and academics from Africa, Latin America and Asia[21].

Variability, redundancy, resilience and hybrid vigor are characteristics and survival conditions for the biocultural web. Now they must also work in the technological one: an absence of variants means the end of evolution, and we must realize that, in the long run, this implies an end for all forms of life: be it a plant or animal species, or man himself and his stories.

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[20] See https://www.apc.org/es/node/36461

[21] See its manifesto: https://justnetcoalition.org/digital-justice-manifesto

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Review

Data Feminism by Catherine D'Ignazio and Lauren F. Klein (Cambridge, Mass: MIT Press, 2020)

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Data Feminism by Catherine D'Ignazio and Lauren F. Klein (Cambridge, Mass: MIT Press, 2020) sets out to interrogate the ways in which standard practices in data science reinforce existing inequalities in contemporary society. The writers argue that oppressive systems ultimately harm everyone and propose using a redesigned and more equitable data science to challenge and change the distribution of power. They define *data feminism* as using a data-driven approach to overcome oppression, and outline its seven principles, each of which is examined in detail in its own chapter, as follows: 1. Examine power; 2. Challenge power; 3. Elevate emotion and embodiment; 4. Rethink binaries and hierarchies; 5. Embrace pluralism; 6. Consider context; 7. Make labour visible. In underlining the authors' commitment to the principles they espouse, the book is fully open access (and has been updated since first published) and the volume concludes with a statement of their values and metrics by which they hold themselves accountable, followed by an audit of the book by Isabel Carter.
D'Ignazio and Klein introduce a host of key terms to provide their readers with the language to successfully critique systemic and structural inequalities. They include familiar designations, such as redlining, the systematic denial of services to residents of certain areas; the recent development of digital redlining, whereby digital technologies are used to further perpetuate inequities experienced by marginalised groups; and intersectionality, coined by Kimberlé Crenshaw, to acknowledge the intersecting aspects of a person's identity (or positionality) and the intersecting forces of privilege and oppression in a given society: for example, a black woman experiences the world differently to a white woman and to a black man.[22] This leads to the matrix of domination, as proposed by Patricia Hill Collins, which explains how intersections of oppression are structurally organised leading to unearned privilege or unjust oppression.[23] D'Ignazio and Klein build on these ideas to introduce new phrases to our lexicon, including *data feminism* itself, and *privilege hazard*, which occurs when one struggles to detect oppression because one benefits from the existing structures. This has particular significance when using data because, not only can privilege hazard lead to the creation of unrepresentative datasets, but also ensures that certain data never gets collected at all (p. 33).
In outlining the challenges facing data science, including the necessarily reductive nature of data creation and classification systems, the authors also present a range of solutions for our times. They stress the need for collaboration with communities and engagement with stakeholders, noting that when communities are involved in their own data collection, the process can be empowering and even healing (p. 120). They also argue that all labour needs to be made visible, following the principles of the Collaborators Bill of Rights, and they advocate for design justice, which builds on data justice. In doing so, they follow the ten principles of the Design Justice Network,

[22] See Kimberlé Crenshaw, 'Demarginalizing the intersection of race and sex: a black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics,' *University of Chicago Legal Forum* 8 (1989) 139–167; and 'Mapping the margins: intersectionality, identity politics, and violence against women of color,' *Stanford Law Review* 43.6 (1991) 1241–1299.

[23] Patricia Hill Collins, *Black feminist thought: knowledge, consciousness, and the politics of empowerment* (Hyman 1990; repr. Routledge, 2008).

which seeks to use design to empower communities and liberate people from exploitative and oppressive systems. This is in opposition to so many systems which are designed by individuals for people like themselves, and implicitly or explicitly exclude those who are not like them.

Data Feminism is inclusive, engaging, accessible and thought-provoking. It is essential reading for anyone interested in understanding and critiquing the ways in which data – in multiple forms – has come to dominate our lives, and an excellent resource in the classroom.[24] The argument is enlivened by the authors' judicious use of real-world examples, such as Christine Mann Darden, one of NASA's hidden figures, and someone who, for D'Ignazio and Klein, 'models' how to use data to overcome oppression: in Darden's case, her lack of promotion prospects at NASA (Introduction: why data science needs feminism). In illustrating inequity in design, they highlight the ludicrously small size of women's pockets compared to men's, noting that pockets in women's jeans are about half the size of pockets in men's jeans, and only 40% of the front pockets of women's jeans can fit a smartphone (Chapter 4, 'What gets counted counts').[25] However, the case study that frequently makes the biggest impact on my students is that of the tennis superstar, Serena Williams in Chapter 1, 'The Power Chapter'. Williams is a figure of such global renown that she is often known simply as 'Serena'; nevertheless, Serena's iconic status did not protect her from experiencing the sharp end of modern medical science's disregard for the testimony of women of colour when giving birth to her daughter, Olympia, in September 2017. Afterwards Serena publicly recounted her experience and highlighted the shocking statistic that black women in the US are three times more likely to die in childbirth than white women. Her power on the tennis-court is well known, but D'Ignazio and Klein argue that her power as a global superstar ensured she could advocate for herself in a crisis situation, when so often black women and women of colour are silenced. In overcoming the matrix of domination, Serena revealed the extent of its pernicious influence.

[24] *Data Feminism* is core reading for my second-year Digital Humanities module, 'Gender, Race and Digital Humanities' (DH2009).

[25] See further: Jan Diehm and Amber Thomas, 'Someone clever once said women were not allowed pockets', *The Pudding* (August 2018).

Systems Interference: arguments, samples, new work

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This presentation paper, prepared in advance of the first Digital Art in Ireland symposium, in June 2022, problematises received wisdom about what can constitute digital art, and provides background to my set of approaches to the technological landscape. Specific attention is given to new work commissioned by the Arts Council of Ireland (O'Connell 2022d) for a touring exhibition to open in September. Rather than fixating on image manipulation, and the capabilities of latest digital tools or apps aimed at designers, my practice encompasses interaction with the ubiquitous technologies about us. For the most part anyway, the former results in what Joanna Zylinska terms mere 'style-transfer' (2020, 11, 50, 62). The positions adopted in her *AI Art* book fit with longstanding concerns of my own:

> By the 1990s it had become unimpressive to point out that 'art' could be produced using computers too. The suggestion that hardware and software amounted to an additional tool in the box like a set of brushes or musical instrument revealed naivety on two fronts. Firstly, new media and the emerging network represented not just a change in degree but one in kind. Secondly, the fact that a self-critiquing and at times self-destructive 'art system' had evolved during the twentieth century was overlooked (O'Connell 2015, 1).

Not to be critical of all the activities which take place under the banner of digital art or technology art, but the significance of computing, with respect to creative endeavours, began to be foregrounded as far back as pioneering exhibition *Cybernetic Serendipity* (Reichardt 1968). Of course, there have been numerous technological developments since that time, not least the emergence of the internet and today's astonishing computational network, but rather than politely consent to what are ultimately corporate imperatives, to utilise certain tools aimed at so-called creatives, isn't the omnipresence of general technologies and the encapsulating network intriguing to engage with in its own right? Generative art (Tate 2016a), makerspace/hackerspace culture (Sebrechts 2022) perhaps, and Net Art (Tate 2016c) were more knowing means of harnessing computational power and adapting to the internet and the web as it emerged. Nevertheless, many digital artists not unlike photography artists before - speculatively reflecting qualms about their media and practices being recognised as legitimate in institutional contexts - appear prone to a fundamental conservatism.



Still, 3D animation (O'Connell 2005) using digitally scanned mug pieces, Mocksim.

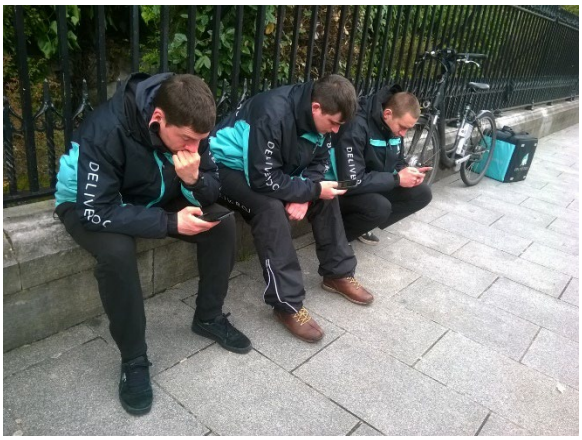
The more challenging twentieth-century end-of-art tendencies have been alluded to above. It is over a century since Marcel Duchamp's - or was it Baroness Elsa von Freyrtag Loringhoven's (Hustvedt 2019)? - famous gesture (Howarth and Mundi 2015), and over

fifty since Douglas Huebler stated, 'The world is full of objects, more or less interesting; I do not wish to add any more' (Levin 2017). (In retrospect, Huebler's words sound curiously attuned with today's environmental concerns.) In his important 1980s series *Secret Languages*, Irish polymath Joseph Ardle McArdle too, had challenged quainter notions about what art could be (RTÉ Archives 2017). McArdle did so mainly from a pop-art perspective but with a philosophical dimension. In one episode, entitled *The Everywhere Gallery*, he held up an orange plastic bowl and stated,

> I am not attacking the good, the true and the beautiful but I am merely objecting to that false romanticism, which while it recognises quite justly, let's say, the attractiveness of a Celtic brooch, fails to see that a plastic bowl like this has its own beauty. But imagine if you had never seen plastic in your life, and suddenly you came across something like this: bright, smooth, perfectly circular, for you that would be a real work of art (MacMahon 1982b)

It is not fashionable nowadays to extol the wonders of plastic, though arguably, the pop-art phenomenon could be interpreted as unconscious parody of developed-capitalist consumerism. McArdle's point is relevant, nevertheless.

Appropriation has been key to my own activities during the past two decades, employed as an attempt to unearth the poetic in everyday, often dysfunctional, technologies and systems. Strategies include misuse, misunderstanding, lampooning, tinkering and ethical, or what I call 'mild', hacking. Also, whilst much attention is given to the straightforwardly digital and algorithmic, it is interesting to note that computational flows are directly reflected in changes to older tangible networks, such as the road system. Technology then incorporates not only the much talked about software, code, algorithms, the digital, and pervasive hand-held devices or surveillance apparatuses, but the older and heavier, mundane machineries and, thirdly, the analogous bureaucratic codes and systems could be included. Regarding the latter point, 'much of the language associated with software development; terms such as application, code, instruction, method, procedure, program, and routine, along with script, existed before, and still have meaning beyond the realm of computing' (O'Connell 2021a, 54–55). The various systems are linked to each other, but some are the subject of critical conversations, whilst others are ignored or taken for granted. Heavy goods vehicles move materials from distribution centres, through warehouses; courier companies of many sorts are in operation, shifting real packages in ways that are analogous to 'packet switching' (Naughton 2008) in communication networks.



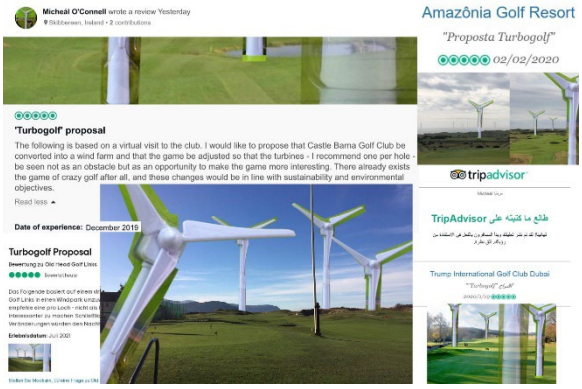
Deliveroo Riders outside Crawford Art Gallery, Cork City, Photo Mocksim, April 2016.

A 'disrupter' firm like Deliveroo appears, new apps and interfaces are developed, agreements are discussed behind the scenes, and suddenly, the streets are peppered with cyclists and scooter riders with turquoise-coloured cubic boxes - three dimensional pixels if you like - on their backs. 'What is essentially software, has material effects; the physicality and real impacts are instantly felt, not least by the riders themselves who risk life and limb, in

precarious employment, to deliver what is already "fast food"', even faster (O'Connell 2021a, 54). And, in keeping with a key argument in this paper, the agreements between corporations and governmental bodies referred to above, including any standards and regulations that result, and without which the apps would be useless, can be considered a form of software too. One activity of mine, in fact, involved being 'onboarded' as a Deliveroo rider (O'Connell 2018). Another project used courier company parcel-tracking information, and specifically collections of 'point of delivery' signatures (Greslé 2014; O'Connell 2012). Supermarket self-checkout machines were used, but to buy nothing, and a short instructional video produced to demonstrate how (O'Connell 2016b; 2014). Money was sent flowing unnecessarily between bank accounts, daily, via standing order (O'Connell 2020b). A phone handset was set up as speed camera (O'Connell 2016c). And acoustic symphonies were created through simultaneous use of sat-nav software and maps-apps whilst driving in the opposite direction to the programmed destination (O'Connell 2017).

The Arts Council commissioned new work which would use similar 'Systems Interference' approaches, for a touring exhibition which would open in September 2022, as stated, at Uillinn: West Cork Arts Centre involving peripheral events and dissemination beyond the institutional spaces (O'Connell 2022c). Unsurprisingly, the relationship between landscape and technology has been a point of focus. During residencies and periods in West Cork since 2019 I have been looking at the increasing, and dramatic presence of wind turbines for example, as well as the giving over of space for the purposes of sport and leisure: golf for instance, and the old, arguably bottom-up-disruptive, Cork and Armagh, game of road bowling. One aspect of the new work arises from the thought experiment, or entrepreneurial idea if you like, that golf courses could be turned into, wind farms. The suggestion is that the changes would not only fit with environmental imperatives but would make the game more interesting. Already there are traditional obstacles such as 'rough' and bunkers; most courses will either have penalty areas, trees, bushes, or sometimes water, that present a challenge to the player. And let us not forget, that in many countries there exists the sport of crazy golf.

I have been posting this 'TurboGolf' proposal (in the form of reviews) on TripAdvisor sites for golf courses, golf links and resorts in Ireland (O'Connell 2020a, 14) and around the world, together with rudimentary mock-up images, to give an artist's impression of what the new and improved game would look like. Sometimes these proposals are removed, and in other cases they stick (O'Connell 2021c; 2022a). Human gatekeepers are clearly involved, and algorithmic policing is a factor too. Google Translate is useful for converting the text into the local language. *Trump International Golf Course* in Dubai wrote back in Arabic thanking me for the visit and inviting me to come again soon. This, though I had been clear that the visit was a virtual and not real one, but perhaps it can be claimed, in keeping with the current preoccupation with the metaverse (O'Brien 2021), that looking at photos online and through maps counts as an actual trip nowadays. Another resort was discovered in the Amazon rainforest - or more correctly in what was once part of the Amazon rain forest - and the proposal was posted there successfully, in Portuguese.



Collage of screenshots, from TripAdvisor *Turbogolf Proposal*, Mocksim, 2020.

Thinking about aesthetics, as artists are expected to do, links – excusing the pun - could be made with nineteenth century

romantic-art concerns, and notions of the picturesque. Garden, park, and golf course design, exploits methods such as prospect-refuge-theory which emerged then, and design principles such as Savannah-preference are relevant, as they were in the very successful children's TV series, *Teletubbies*. Golf might be *Teletubbies* for adults, but I would like to stress that in no way is the activity intended to mock those who play the sport. The elitist connotations of golf may still be a factor, but women and working-class people made claims on the game long ago, and the situation is different now. Who is to say that, wind turbines, one on every green, would not make golf a more stimulating experience (O'Connell 2021c)?

It would be reasonable to presume that education for designers, artists, or to use the contemporary parlance, 'creative practitioners', encompasses learning theories, rules and principles, about best practice, and means of achieving certain qualities via tried and tested craft-skills. And of course, this knowledge does form part of the training. Not only that but now it is possible to have access to a plethora of tools which allow, at least in principle, high production-value artefacts to be created on a low budget. Nevertheless, it would seem ridiculous if individual practitioners were expected to compete with professional studios and industrial-scale filmmaking or advertising organisations. Second, it would surely also be a mistake to presume that such standards, often simply conventions or related to the language of commerce and spectacle, be deemed compulsory. As Joseph McArdle put it decades ago, 'there is no standard culture or artistic language, there are only dialects' (MacMahon 1982a; RTÉ Archives 2017). In certain cases, there will be a rationale to embracing given principles. University of Goldsmiths, London, based group Forensic Architecture are consciously 'thorough and data-obsessed in the stereotypical manner of engineers or lawyers say. Their reappropriating a corporate look is ironic… [but] imaginal thinking as a route to understanding clearly plays a huge role in the investigations too' (O'Connell 2020c, 26; Weizman 2022). Hito Steyerl employs footage from different sources in her filmmaking and has written positively about the agency of poor images (2009). Sophie Calle, who in ground-breaking early work, was happy to re-present the photographs supplied by a jobbing private detective (Calle and Auster 2007), is often categorised as an art-photographer. An artist like Glenn Ligon re-presents historical materials in thought-through unconventional arrangements (Ligon 2014; Camden Arts Centre 2014). So, what constitutes accomplishment, and the terms of 'craft', vary dramatically from artist to artist.



Poster produced as part of the *#camponagolfcourse* work. Mocksim, 2021.

Qualities in my own works, as they are presented, typically arise directly from the line of inquiry, or augmentations are carried out only to amplify the inherent characteristics of readymade items, or in connection with a relevant concept or degree of 'institutional critique'(Tate 2016b). Presentation scales for 'found' assets or digital materials may be taken to unusual extremes for instance, as was the case with an exhibition entitled *Contra-Invention* comprised of the images traffic wardens capture during their policing activities (Sheerin 2011), and with one project mentioned, which resulted in a collection of

receipts accumulated as proof of buying nothing (O'Connell 2016a). In keeping with another habit, initially a practical decision on my part, to use day-to-day lived experience as a kind of studio (O'Connell 2022a), whilst camping in Skibbereen, Co. Cork during summer 2021, the idea of pitching the tent on a golf-course occurred to me. Wouldn't this also, potentially, be an efficient use of such facilities? To begin, I edited a photograph of the actual tent in question, into an easily obtainable image of Old Head Golf Links in Kinsale, Co. Cork. As it happened the construction of this exclusive course had been a source of much controversy, because it prevented access to what had been seen as a 'beauty spot' and right-of-way (*The Irish Times* 2001; Buckley 2013), so it seemed like a reasonable target. Whilst I went to a certain amount of trouble to embed the tent photo into the found landscape picture, I was consciously not being too meticulous either. The objective was to be expedient in communicating the idea and experimenting with an approach. It was surprising, then, once versions of the image had been posted on Instagram and Twitter, how many believed I had actually camped on the course in question. In fact, the background photo of the course, was of the standard promotional variety aimed at tourists, and one of the first to appear when searching. At any rate, due to the history of protests and trespasses, Old Head Golf Links is heavily secured, so it would be highly unlikely someone could gain access for an overnight stay. The reactions are understandable of course as a reflection of how little attention is generally paid on social media, the ease with which people believe what they want to, and in what amuses. The montaging of tent with landscape had been done on a workstation, with 4K screen, but viewers using handhelds, would have been swiping, and observing for very brief periods. Some were sceptical, not least my own daughters, to whom I had sent postcard versions from Cork, but others just accepted the images at face value. Following this first action, further similar images were produced but I also looked into carrying out actual guerrilla camping with the intention of evading any questions as to whether this could actually have happened. In addition, I approached clubs about pitching a tent legitimately, for photography-shoot purposes only. Conversations were friendly but club managements never got back. Media channel *Cork Beo* made contact and conducted an interview during which, whilst not deceiving, it was possible to maintain an ambiguous stance. I suggested that for obvious reasons, it would be difficult to confirm whether the 'wild camping' had taken place or not. Another impression, consciously given, was that the photographs could have resulted from genuinely having camped out, but then afterwards been carefully manipulated so that they appeared Photoshopped (for self-protection). Other experiments included promoting these campsites on Google Maps, with interesting results:

> Old Head of Kinsale Golf Course... asked Google to remove it so Google phoned me to confirm that 'you guys' have got a golf course there. 'Can you camp there on the golf-course?' he asked. I responded by saying that 'It depends on your conceptual framework'. A short peculiar conversation ensued... (O'Connell 2022b)



Modified still from *Insecurity Camera Dance*, recording, Mocksim, July, 2021.

An aspect of the activity, not mentioned so far, has been to interrogate or hack the West Cork Arts Centre itself and immediate surrounds, almost as a series of warm-up exercises. After several attempts, for example, I successfully managed to remain within the sights of the security camera at the front of the building, as it cycled through its default automatic routine. The resulting piece, footage captured at the camera's resolution, was given the title *Insecurity Camera Dance* (O'Connell 2021b). The intervention was carried out, aptly perhaps, on the same day Skibbereen rowers, including one of the famous O'Donovan Brothers, won their gold medals at the 2021 Olympics (Kelleher 2021).

These are elements of work in process, observations and interferences, some inherently 'digital', and also connected with technology in a broader sense.

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Humanidades Digitales: infraestructuras visibles e invisibles[1]

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IIBICRIT, CONICET Argentina

¿Qué son las infraestructuras?

El concepto de infraestructura resulta fundamental en las teorías marxistas y post marxistas, en tanto factor central del proceso histórico que, según el caso, determina o transforma el desarrollo de la sociedad, pesando sobre las relaciones de poder y producción a nivel superestructural. Desde un abordaje pragmático, que sigue literalmente la etimología del término, las infraestructuras son aquello que sostienen o soportan otra cosa: un sistema, un objeto, un proceso. Por esta razón, las infraestructuras suelen definirse como invisibles para los humanos, quienes apenas se percatan de su existencia cuando estas se rompen o desaparecen (Bowker, 1998, Jackson et al., 2007; Corsin, 2018; Binder et al., 2015). Esto hace que su componente ideológico, en tanto elemento configurador de condiciones de posibilidad y de relaciones de poder y autoridad, sea difícil de percibir a primera vista.

En el contexto de las humanidades digitales (HD), una infraestructura puede referirse a objetos físicos, como computadoras o servidores, pero puede asimismo encontrarse bajo la forma de código, de software, de estándar, y hasta en la organización de un grupo de investigación, laboratorio, centro o asociación académica. Al igual que lo que proponen Badenoch y Flickers (2010: 11) con respecto a las infraestructuras de investigación digital o las infraestructuras digitales para la investigación (digital research infrastructures), podemos entenderlas como un conjunto de tecnologías que mediatizan la investigación y los recursos, la colaboración y la diseminación de resultados. No obstante, al ser las HD un campo que define una gran parte de sus marcos teóricos, metodologías y prácticas en la intersección de la investigación humanística (y humana) con el componente digital, es válido preguntarse hasta qué punto la tecnología digital valida o sostiene su episteme y cómo lo hace (Bhattacharyya, 2017; Liu, 2017), además de pensar qué tipo investigación en HD se puede hacer en un contexto con mayor o menor presencia de infraestructuras digitales que permitan la accesibilidad y la sostenibilidad y preservación de los contenidos a largo plazo. Asimismo, cabe interrogarse acerca de las relaciones de las infraestructuras tecnológicas con las infraestructuras sociales y cómo estas pueden crear infraestructuras de conocimiento más o menos abiertas o más o menos descentralizadas (Shorish y Chan, 2919). Alberto Corsin (2018: 5-7) expone esta cuestión, aunque en un contexto muy diferente, a partir de un contraejemplo de carácter social de Perú. En Lima apenas llueve y, ante la falta de agua, muchas empresas

[1] Una primera versión en español de este trabajo fue publicada en el sitio del laboratorio de Humanidades Digitales (HD LAB) que dirijo en el Instituto de Investigaciones Bibliográficas y Crítica Textual (IIBICRIT) del Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET): https://hdlab.space/HD-infraestructuras/. Basándome en este texto escribí en inglés el capítulo "Digital Humanities and visible and invisible infrastructures" para el libro *Global Debates in Digital Humanities*, editado por Domenico Fiormonte, Sukanta Chaudhuri y Paola Ricaurte, y publicado por Minnesota University Press en 2022. La mayor parte de la investigación sobre infraestructuras en las Digital Humanities fue posibilitada por los recursos Sci-Hub y Library Genesis. El hecho de que casi un 80% de los artículos científicos y capítulos de libro sobre este tema se encuentre tras paywalls indica, por un lado, la geografía de los debates, algo lejana al acceso abierto inmediato y sin restricciones, habitual hace más de una década en América Latina y un aún pobre debate sobre el tema a nivel global en las HD. Por el contrario, el acceso abierto sin restricción a la mayor parte de publicaciones del campo de la comunicación científica o la ciencia abierta que menciono en este trabajo, da cuenta, no solo de la centralidad del tema en estos campos, sino también de un diálogo mucho más fluido, abierto y global.

empiezan a venderla en camiones cisterna a los ciudadanos a un precio altísimo. El Estado apenas los oye y, entonces, son los ciudadanos los que diseñar unas enormes mallas "atrapanieblas" -16 metros de alto por cuatro de ancho- que intervienen el paisaje y permiten condensar la espesa neblina limeña. Las gotas de agua que quedan suspendidas en la malla descienden por gravedad a un sistema recolector que las traslada a una cisterna, llegando a capturar por día unos dieciséis litros de agua. Así, los ciudadanos generan, construyen sus propias infraestructuras. Modestas, superpuestas, complejas.

El ejemplo da buena cuenta de lo que el arquitecto cubano Ernesto Oroza, define como arquitectura de la necesidad para describir la expansión de la ciudad de La Habana en Cuba, que se produjo de forma espontánea y en respuesta a las necesidades inmediatas de sus habitantes, muchas veces en contraste directo con las regulaciones gubernamentales y los intentos de reorganizar y regular su desarrollo. En una entrevista al arquitecto cubano, Alex Gil (2016) comenta que este concepto es, en gran medida, comparable con el desarrollo de proyectos de investigación de HD y sus dificultades para obtener financiamiento y acceso a infraestructuras.

Lo hasta aquí dicho ilumina también el problema acerca del derecho a las infraestructuras, las infraestructuras como derecho, y la repentina visibilidad de las infraestructuras cuando una comunidad toma el control. Los ejemplos proporcionados en este trabajo bucearán, de un modo u otro, en esta tesis, con el fin de pensar las infraestructuras de las HD.

Las infraestructuras de las HD

La emergencia de las HD a partir de la segunda mitad de la década de 2000 centralizó debates acerca de la diversidad y las tradiciones y hegemonías en este campo, principalmente en los foros de las academias del llamado Norte Global (Risam, 2018; Fiormonte, 2012, 2014). No obstante, estas conversaciones se focalizaron en problemas como los monopolios de lengua, género o raza, sin atender a una reflexión sobre las instituciones como órganos de poder para entender los diversos contextos -no solo académicos, culturales, sino también socio-económicos- de las HD a nivel global (Fiormonte y del Rio, 2017).

Podríamos aquí partir de una de las tantas reflexiones de Marx acerca de la objetivación del conocimiento en las máquinas:

> La naturaleza no construye máquinas, ni locomotoras, ferrocarriles, electric telegraphs [telégrafos eléctricos], self acting mules [hiladoras automáticas], etc. Son estos productos de la industria humana; material natural, transformado en órganos de la voluntad humana sobre la naturaleza o de su actuación en la naturaleza. Son órganos del cerebro humano creados por la mano humana; fuerza objetivada del conocimiento (Marx, 1976: 229).

En una línea de pensamiento algo similar en lo que hace a la materialidad de las HD, Liu (2017) subrayó varias veces el hecho de que estas construyen un "new materialism" basado en proyectos, software, hardware, cuestión sobre la que, desde otro lugar, Kirschenbaum (2010) había ya llamado la atención al afirmar que las:

> Digital humanities, which began as a term of consensus among a relatively small group of researchers, is now backed on a growing number of campuses by a level of funding, infrastructure, and administrative commitments that would have been unthinkable even a decade ago (…) (2010: 60).

Algo que Gold (2018) años más tarde

tampoco dejaría pasar.

Volviendo a Kirscenbaum, el investigador norteamericano dejaba ya entrever la invisibilidad de las infraestructuras que, al sostener las tareas de investigación y docencia en HD, naturalizaban una definición y accionar:

> Whatever else it might be then, the digital humanities today is about a scholarship (and a pedagogy) that is publicly visible in ways to which we are generally unaccustomed, **a scholarship and pedagogy that are bound up with infrastructure in ways that are deeper and more explicit than we are generally accustomed to**, a scholarship and pedagogy that are collaborative and depend on networks of people and that live an active 24/7 life online (2010: 60). (el énfasis es mío)

No obstante, desde mi punto de vista, la reflexión sobre las HD como infraestructuras tecnológicas y de conocimiento ha sido dispar y sesgada, dando lugar a trabajos rigurosos, aunque de carácter descriptivo y/o constatativo, sin ningún acercamiento a los problemas que trajo consigo el universo de infraestructuras web y la nueva geopolítica del conocimiento (Sordi y Fiormonte, 2019). Por nombrar unos pocos ejemplos, Tasovac et al. (2015) hablaban con justa razón de un "infrastructural turn" en las HD con implicaciones prácticas en las formas en las que hoy día se construyen herramientas y recursos. Más recientemente, Bernardou (2018) sostenía que en los últimos veinte años habíamos asistido al exitoso establecimiento de infraestructuras de investigación y recordaba que ya, para 2014, Erik Champion entendía –siguiendo la teoría de Karen Knorr-Cetina (2001) sobre las infraestructuras como ecosistemas dinámicos- que a las HD debíamos pensarlas en términos de ecosistema académico ("scholarly ecosystem"). La lectura de estos trabajos podría dejar a cualquier lector con la idea de que la tecnología es una e idéntica y que todos los usuarios de esas tecnologías cuentan con la misma alfabetización digital.

El desarrollo de las infraestructuras de investigación digital en los últimos veinte años fue anticipado, en muchos aspectos, por dos textos surgidos en Norteamérica: el Informe Atkins sobre ciberinfraestructuras para la investigación (Atkins et al., 2003) y el informe de la American Council of Learned Societies (ACLS, 2006). Sin embargo, la conversación sobre infraestructuras no tuvo un calado hondo a ese lado del mundo, más allá de proyectos como Bamboo -"a humanities cyberinfrastructure, particularly for working with textual corpora" (Dombrowski, 214: 331)-, que Quinn Dombrowski bien supo destripar para aprender del fracaso. Fue en Europa, hacia 2006, donde estrategias a largo plazo como la European Strategy Forum on Research Infrastructures (ESFRI) -"a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach (Blümm y Schmunk, 2016)- se hicieron de esta agenda de interés para las Humanidades, creándose CLARIN, la infraestructura para recursos lingüísticos y tecnología (www.clarin.eu), DARIAH, la infraestructura de investigación digital para las Artes y Humanidades (www.dariah.eu), y ARIADNE, la infraestructura de investigación avanzada para datasets de Arqueología (www.ariadne-infrastructure.eu). En líneas generales, uno de los objetivos que dicen compartir estas infraestructuras es el de abordar la naturaleza compleja de los datasets en la investigación con herramientas digitales en las Humanidades, y una mejora comprensión de la investigación con métodos y prácticas de trabajo colaborativo en Humanidades. Otros problemas como la preservación a largo plazo de los datos, la alfabetización digital con técnicas cuantitativas y el reconocimiento y crédito recorren los sitios web donde se explican las misiones y funciones de estas infraestructuras.

Pero la pregunta aquí no es qué

buscan hacer estas infraestructuras, cuestión que la mayoría de las veces resulta oscura a quienes no están dentro de ellas, sino quiénes las conforman y benefician de ellas. En todos los casos, si bien son programas que reciben dinero de la Unión Europea, no pertenecen a ellas todos los países europeos. Tampoco, más allá de los temas que hacen a su agenda, que son de gran interés para cualquier investigador en el mundo, muchas preguntas no parecen siquiera haber sido hipotizadas en algún momento:

1) ¿se pueden homogeneizar las diferentes tradiciones de investigación (y de organización estructural de la investigación) en los diferentes países europeos?

2) ¿cuánto saben los humanistas digitales a día de hoy sobre estas infraestructuras? ¿se espera que sean solo usuarios/consumidores? ¿cómo se piensa esta comunidad y cómo piensa su gobernanza (y la de sus datos)?

3) ¿cómo se mide la representación de las distintas lenguas europeas? El sitio web de DARIAH, por ejemplo, solo se ofrece en inglés, aunque me consta que algunos proyectos de la infraestructura, como OpenMethods, vienen poco a poco abriendo el debate sobre los procesos de apertura en la investigación, desde lo tecnológico a lo lingüístico (del Rio y Tóth-Czifra, 2019).

Estas preguntas de algún modo se relacionan con un trabajo del año 2017 del gran experto en infraestructuras abiertas para la investigación, Cameron Neylon. Entendiendo la necesidad de que las infraestructuras estén sostenidas por la misma comunidad científica que representa, Neylon ilustra algunos problemas de sostenibilidad que no solo se relacionan meramente con los modelos de financiación de estas infraestructuras sino con cuestiones de economía política, considerando esencial el principio de gobernanza comunitaria. En una línea similar están Shorish y Chan (2019) cuando afirman que cualquier infraestructura comprende sistemas y prácticas sociales que reflejan los valores de sus creadores e, idealmente, de quienes interactúan con ella: una infraestructura nunca es neutral sino que implica una lucha por el poder, legitimando voces y determinando cómo y quién puede acceder a la información. Consecuentemente, estos autores reclaman que las infraestructuras de investigación sean construidas y controladas por las mismas comunidades, valorando la diversidad para evitar los sesgos sobre lenguas, áreas de investigación, metodologías, y estándares que solo refuerzan la idea de la que la investigación puede ser reducida a un solo conjunto de prácticas "universales". Un ejemplo que mencionan es el del proyecto Invest in Open Infrastructures (IOI, investinopen.org/docs/statement0.2). En el preámbulo de este consorcio se explica que:

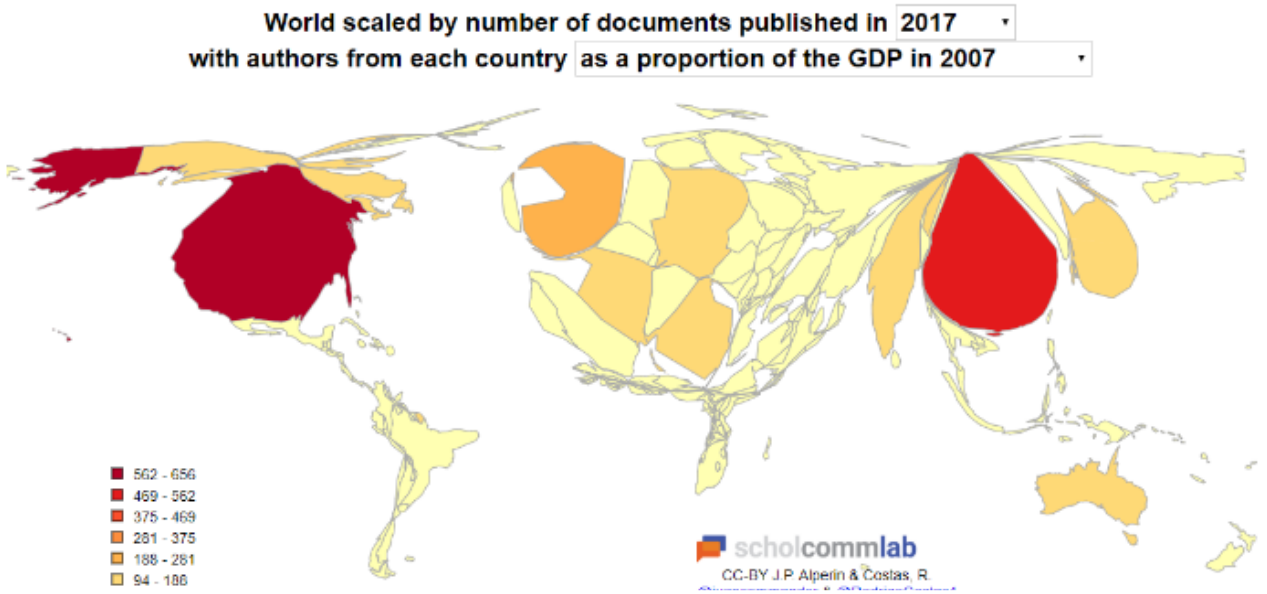
> We imagine a world in which communities of researchers, scholars, and knowledge workers across the globe are fully enabled to share, discover, and work together. It is clear that the needs of today's diverse scholarly communities are not being met by the existing largely uncoordinated scholarly infrastructure, which is dominated by vendor products that take ownership of the scholarly process and data. We intend to create a new open infrastructure system that will enable us to work in a more integrated, collaborative and strategic way. It will support global connections and consistency where it is appropriate, and local and contextual requirements where that is needed.

La declaración de intenciones es clara, a pesar de quedar apenas en la abstracción y no ejemplificar cómo se lograría la construcción y puesta en práctica de estas infraestructuras. Se suma a ello la escasa o nula representación de zonas del planeta más allá de Norteamérica y Europa. Desde mi punto de vista, un abordaje

de mayor relevancia es el de Capadisli (2016), quien apuesta por infraestructuras descentralizadas para la investigación (modelo que en América Latina proponen los metapublishers *SciELO* (https://scielo.org/en/) y *RedALyC* (https://www.redalyc.org/) o metarepositorios como LAReferencia (http://www.lareferencia.info/es/), de los que más adelante hablaré. En un texto tan sólido como seductor recuerda Capadisli (2016) que Harold Innis y Marshall McLuhan sostuvieron en su día que los medios electrónicos, a diferencia de cualquier otro, comprimen el tiempo y el espacio, construyendo, consecuentemente, la idea de "aldea global", y facilitando la centralización del control. Así y todo, aunque Internet y la web constituyen sistemas descentralizado, asistimos, por el contrario, a la centralización en el intercambio de información. Apertura, software de código abierto, construcción comunitaria, descentralización, entre otros, parecen ser los términos que deberían definir entonces nuestras infraestructuras. Tal vez las HD deberían en este momento tomar ejemplo de algunos proyectos sobre infraestructuras abiertas para la comunicación científica para pensar su desarrollo en los próximos años.

¿Y en América Latina?

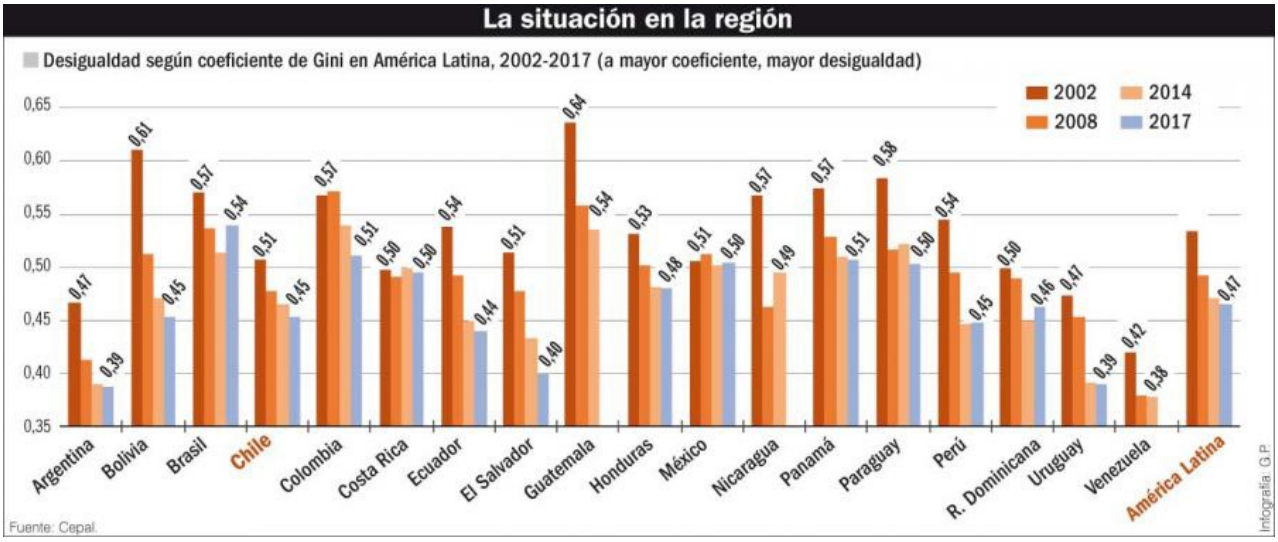
Parafraseando a Juan Pablo Alperin (2015), la investigación científica en América Latina se distingue por: 1) llevarse a cabo en la región más grande del mundo que busca aumentar la visibilidad científica y la calidad de sus publicaciones a través de un modelo descentralizado de portales regionales en línea como SciELO, RedALyC, LAReferencia; y 2) superar a otras partes del mundo en la cantidad de investigación que se publica en línea, en abierto, sin cargo, y sin la mayoría de las restricciones de derechos de autor. Sorprendentemente, o no, infraestructuras del Norte Global, como la Web of Science o Scopus son incapaces hacerse cargo de estas características de la producción científica en la región latinoamericana, como bien ilustra el siguiente mapa:



La publicación científica desplegada en un mapa global. Fuente: ScholCommLab. http://scholcommlab.ca/cartogram/

Al contrario de la propuesta de las infraestructuras para las HD antes mencionadas, las iniciativas latinoamericanas para la publicación científica parecen decantarse por un modelo descentralizado

(Packer et. al., 2006) que contribuya a desarrollar capacidades e infraestructuras en los diferentes países. Paradójicamente, más allá de los avances en lo que hace al Acceso Abierto, la democratización del conocimiento y la justicia cognitiva, América Latina es la región más desigual del mundo, una región, según el World Economic Forum on Latin America, con los niveles más bajos de digitalización de la ciudadanía, así como niveles muy bajos de adopción de tecnología.



Desigualdad según coeficiente de Gini en América Latina. Fuente: CEPAL 2019.

Si, como decían Bhattacharyya (2017) y Liu (2017), a la epistemología de las HD subyace la tecnología, varias preguntas se vuelven entonces urgentes: ¿Cómo podemos elaborar un curriculum en Humanidades Digitales en una región atravesada por la desigualdad social, la obsolescencia de las infraestructuras y la falta de adaptación a los avances tecnológicos? ¿Pueden las HD en América Latina "competir" con los modelos de financiación, sostenibilidad y legitimación de las HD del Norte Global? (del Rio Riande et al., 2018ab). ¿Qué pasa entonces con las infraestructuras para la investigación en HD en América Latina?

Un ejemplo sobre HD desde Argentina

Por poner solo un ejemplo, hace dos años funciona dentro de CONICET el primer laboratorio de HD, llamado HD Lab (http://hdlab.space/). Con un esquema horizontal de trabajo empezamos a trabajar en la posibilidad de anotar y editar digitalmente, y explotar desde los métodos y herramientas cuantitativos y macroanalíticos (Jockers, 2013), un corpus de textos de tipo cronístico/relato de viaje, de entre los siglos XVI-XVII, que describen por primera vez la zona del Rio de la Plata.

Al tamaño modesto del laboratorio le hace juego la inexistencia de financiación específica para las HD en Argentina (y la región), lo que hace que, en la mayoría de los casos, se deba buscar formas de financiar el trabajo con fondos extranjeros o con la participación en grupos de investigación fuera del país. En nuestro caso, gracias al apoyo del hoy denominado Pelagios Network (https://pelagios.org/) pudimos llevar a cabo gran parte de la investigación, anotación semántica colaborativa, y edición de este corpus. Pelagios Network es una comunidad y una infraestructura que trabaja con tecnologías semánticas como Linked Open Geodata para las humanidades. Su objetivo es

fomentar mejores vínculos entre diferentes recursos en línea (fuentes relacionadas con datos históricos, geográficos, mapas) para documentar el pasado. Pelagios Network ofrece a la comunidad de humanistas digitales herramientas y recursos online que, por un lado, no necesitan de conocimientos de programación y, por el otro, permiten un trabajo colaborativo en la nube. Destaco este elemento en primer lugar, porque los intereses de Pelagios no estaban puestos en la anotación y georreferenciación de textos coloniales latinoamericanos en un primer momento. Eso supuso al laboratorio, no solo trabajar con herramientas pensadas principalmente para textos en inglés, sino para textos del pasado clásico o europeo. Desde nuestro lugar, no solo recontextualizamos una infraestructura como la de Pelagios, sino que transculturamos (Ortiz, 1963) sus herramientas desde la periferia: creamos desde materiales y tutoriales en español, a un gazetteer específico para este tipo de textos (Indias, basado y con la colaboración del HGIS de las Indias de Wener Stangl, https://www.hgis-indias.net/). Evidentemente, este trabajo no podíamos realizarlo entre apenas tres trabajadoras y sin las geoinfraestructuras necesarias. De la mano de ello, a la imposibilidad de acceder a infraestructuras de investigación más básicas, como servidores propios y a los problemas de inestabilidad en la conexión wifi, se los enfrentó con el uso de tecnologías mínimas, abiertas y agnósticas que en los últimos años vienen denominándose como Minimal Computing (Minimal Computing Working Group, s/f).

Es importante resaltar que el término minimal no hace referencia aquí a lo poco o lo simple en el aprendizaje informático o la destreza técnica, sino a las características de la arquitectura de software, la infraestructura de hardware y el mantenimiento a largo plazo de los proyectos de investigación que la utilizan. Desde este abordaje, la gestión de los datos puede realizarse desde un repositorio local o en la nube, y este puede tener las características de un pequeño repositorio de carácter personal o compartido, como los que ofrece GitHub. En definitiva, para crear un proyecto con minimal computing no se requiere de una gran cantidad de recursos, de ahí la definición de mínima. Esta escasa necesidad de recursos materiales y de procesamiento y almacenamiento redunda en una mejor accesibilidad y una mayor estabilidad para conexiones con acceso limitado, además, de favorecer la autogestión. En segundo lugar, el concepto minimal atiende a la posibilidad de generar una publicación en formato web de tipo estático, con un diseño simple, donde se dispone de forma concisa de la información que allí se aloja. En tercer lugar, el concepto minimal se relaciona con el uso de tecnologías open source (Viglianti, 2018). Finalmente, la noción de minimal puede aplicarse al aprendizaje de estándares de código abierto que sirven para interactuar con la mayor parte de los objetos web, como los lenguajes de marcado TEI-XML, markdown, HTML, CSS, y a la comunicación directa con el ordenador a partir de la línea de comandos (Allés y del Rio Riande, en prensa; del Rio Riande, 2022). Esta elección autoimpuesta es parte de los estándares del laboratorio, integrándose los principios de apertura de la ciencia abierta en el país que, para nuestro caso, se remiten a lo abierto relacionado con corpus, documentación, colaboración, datos, software y publicación (del Rio Riande, 2016).

En nuestro caso, el binomio GitHub-Zenodo, GitHub pages-Jekyll, se transformó en esencial, tanto para repositorio de datos y trabajos, como para herramientas de publicación. Es decir, estamos haciendo investigación en HD en un espacio completamente desprovisto de un marco institucional que regule las HD y huérfano de una infraestructura de investigación que nos arrope. Si bien hemos encontrado las soluciones metodológicas y tecnológicamente adecuadas a nuestro contexto y nuestros objetivos, el panorama resulta tan desigual que apenas puede relacionar la escala, intereses y

las herramientas de las HD europeas o norteamericanas y los de nuestro laboratorio.

Y este no es un panorama ajeno a los proyecto en HD en América Latina. Si bien, por ejemplo, en Argentina, en la última década, la creciente toma de conciencia sobre la importancia de la circulación y el acceso a los datos se ha visto objetivada en dos leyes de enorme trascendencia -la Ley de Repositorios Institucionales 26899/13, que impone la obligación de publicación de las fuentes primarias de la investigación financiada por el Estado Nacional, y la Ley de Acceso a la Información Pública 27.275/16, la cual garantiza el derecho de acceso a la información pública y a la transparencia activa de las gestiones de gobierno- estas iniciativas apenas han puesto en la agenda académica al campo de las Humanidades. Este ha quedado completamente rezagado, si no olvidado, en lo que hace a la gestión y preservación de los datos de investigación y a las necesidades de los investigadores. En nuestro caso el laboratorio genera hoy su propia infraestructura, a través del uso de tecnologías mínimas y abiertas para la anotación, edición y explotación y publicación del corpus, y para el almacenamiento y preservación de los datos. Este proceso, que ha sido parte de una investigación casi artesanal, de "prueba y error", en el cual mucho he aprendido de mis colegas del norte, como parte de mi colaboración con el consorcio FORCE11 (https://www.force11.org/), hace que la infraestructura que usamos en el laboratorio se vuelva visible en cada uno de los pasos que llevamos adelante en nuestro proceso de investigación.



Workflow de ediciones digitales de HD Lab. Fuente: del Rio Riande (2022).

De todo lo visible y lo invisible o volver a pensar la investigación en HD

Hace ya varios años Alejandro Piscitelli (2015) explicaba en "Googlecentrismo, interfases [sic] supuestamente invisibles y crítica política de la red 2.0" cómo estábamos hoy llamados reconstruir el proceso de invisibilización de la interfaz de los ordenadores comenzado hace más de dos décadas. Según el filósofo argentino, habíamos caído en la trampa del alejamiento de los comandos cegados por la metáfora user-friendly, en un gesto que solo nos llevaba a desapropiarnos de la máquina como objeto y medio, y a obliterar nuestras

capacidades productoras.

Sin duda, este retorno a la materialidad de lo digital es una de las deudas pendientes de la investigación en HD, y más aún en la que se lleva a cabo en los países de habla hispana, donde el estudio de la hipertextualidad prevaleció por años en pos de un textocentrismo voluble e intangible que no dio lugar al desarrollo de ese punto de inflexión que podríamos denominar computational thinking (Wing, 2006).

Si algo parece estar reclamando la investigación en nuestros días es un marco estratégico que ponga sus ojos en la materialidad de lo digital, para que esta sirva como base estable para las comunicaciones académicas en el siglo XXI. Mejorar las condiciones de producción en ambientes digitales es vital para la equidad en la academia y para el crecimiento de las HD en una región como América Latina. También pensar en infraestructuras construidas desde los principios de la apertura de datos y textos, el código abierto, la construcción de comunidad y de conocimiento sin monopolios. En ese sentido, los ideales y las tecnologías descentralizadas de las iniciativas latinoamericanas para la publicación científica -*SciELO* y *RedALyC* o LAReferencia- surgen como modelos que bien servirían a una infraestructura latinoamericana para las HD.

El caso de HD Lab muestra cómo un proceso que se sostiene en infraestructuras y workflows abiertos (corpus, datos, software, repositorios; del Rio Riande el at. 2018ab) no necesita de una inversión millonaria, y también ilustra cómo es la comunidad (aquí a mínima escala) la que puede decidir y gobernar sus datos e infraestructuras. Y en algún punto, asimismo se hace eco del derecho a las infraestructuras que Corsin (2018) justificaba con el ejemplo de los cazadores de nubes en Perú.

Geoffrey Rockwell (2013) lo dejó claro hace ya tiempo: "Research infrastructure is not research just as roads are not economic activity. I am compelled here to counter that infrastructure IS people". Creo que, quizás sin quererlo, Rockwell está glosando a Marx en la idea de que no es la conciencia la que determina la vida, sino la vida la que determina la conciencia. En algún punto, no son las infraestructuras las que determinan las HD, sino las HD que construyamos (más o menos abiertas, más o menos comunitarias, más o menos sesgadas por región, lengua, etc.) las que determinarán las infraestructuras que, a la vez, construyamos para luego invisibilizar.

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