

Report on the DIGEING 2022 Workshop

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Introduction

The DIGEING workshop is an event connected to a broader initiative lead by the European union commission (more info [here](#)). The aim of this workshop was to bring together an interdisciplinary group of researcher to tackle the macro-theme of "digital media and human well-being". The final output of the workshop was intended to be a collection of written research proposals, referred to as "chapters" by the organizers, in which the participants would spell out their ideas for future research projects regarding the topic of the workshop. These chapters will be used by the European union commission as a sort of road map to guide future endeavors in the field.

The workshop was organized in two days. The first day was reserved to a cycle of brief seminars, between 5 and 15 minutes, in which some of the participants shared their takes on the problems at hand as seen under the lens of their own field of expertise.

For the second day participants were divided into small work groups, and each group was asked to come up with a collaborative research proposal to be added as a chapter for the road map. These chapters are still being edited and are intended to be made available to the European commission by November 2022.

In the following, a brief account of each individual talk is given¹.

Fabrizio Silvestri, prof. at Univ. Roma, AI and Machine learning.

The talk started by highlighting how easy it is to generate fake news by means of *generative* algorithms. This algorithms are based on deep-learning models that can be used

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¹I should mention that because of previous appointment I could not attend all of the talks.

to generate new and original content starting from very simple text-based queries. The generated content can be impressively convincing, and can take form in a multitude of formats: text, images and videos (deepfakes are the most notorious and dangerous example). A striking example was given by the speaker, when he reported the case of a college student who used the generative text model known as GPT-3, to generate articles that would be consistently featured on the front page of Hacker News (a popular social news website focusing on computer science and entrepreneurship).

The talk then continued by reminding the audience that this kind of generated content becomes particularly dangerous because of the existence of social media networks, considering as those are the main vehicles through which this content can be spread. The speaker then proposes 3 main courses of action towards a possible solution:

- Finding vulnerabilities: identifying the most vulnerable spots in the networks, meaning recognizing the users who are more prone to believe to and get more affected by this kind of generated fake content.
- Detecting the content: developing machine learning model able to automatically detect generated fake content².
- Fighting back: putting in place a series of measures apt to avoid the spreading of this kind of content in the first place. Some examples include more strict regulation on the user activity³, and the adoption of a system of incentives/rewards for users that do not contribute to the spreading of the incriminated content.

Andrzej Nowak, prof. of psychology, univ. Warsaw.

This talk started by stressing that the real problems we are facing do not lie within the technology itself, rather in how the technology is used. The speaker argues that in designing the technology behind our digital media there is a constant "race for human attention", with the goal of manipulating and possibly control the thought process of the final user.

The speaker finds that these practices inevitably lead to violation of privacy of the users, and more generally to negative effects on human interactions. Going even fur-

²It must be said, as it was also pointed out by the speaker, that one of the strong points of these generative algorithms is that they work in an adversarial manner, meaning that they can potentially keep improving the credibility of their output every time that they come in contact with an algorithm that can successfully recognize the generated content. In the long run this could make the task of detecting automatically generated content particularly challenging.

³The speaker expressed his concerns about the thin line separating regulation and censorship.

ther, the speaker considers that we are facing a serious threat to the freedom of choice of individuals, considering as media seem to be increasing the control over human thought.

The speaker views the future prospect of virtual reality and the metaverse as a positive development. The main reason being that by adding a virtual layer to our experience we could lighten up the weight on the real world, effectively giving us a way out for the problem of the finite resources of the real world and allowing our society to keep growing.

Jerome Sakur, cognitive scientist at ENS Paris.

Having established that almost any activity that one can think of has some kind of effect on our brain (learning how to read, playing an instrument ecc...), the question posed by the speaker is how to quantify the real influence, if any, that digital media has on our brain, and in particular on our cognitive functions.

The first quantitative measure taken in consideration is *attention span*. However, as it turns out, attention span is a concept quite difficult to define and measure on its own, let alone measuring the influence that an activity such as the consumption of digital media could have on it.

The second measure discussed is relative to so-called *psychological epidemics*. The observation is that the number of diagnosed ADHD cases is on the rise, and the data shows that there is a statistically significant correlation between this phenomena and the popularity growth of digital media. There is however still no sign of causality between the two and no definitive conclusion can be taken from this observation as of today.

The last measure considered by the speaker concerns another psychological epidemic: clinical depression. Similarly to the ADHD case, a convincing statistical correlation between the number of diagnosed depression cases and the increasing popularity of digital media is observed. For depression however there is some evidence of causal relation, although very weak.

The final conclusion of the speaker is that there is no decisive evidence for cognitive effects induced by digital media on our brain. In view of this conclusion, and according to the personal hunch of the speaker, our efforts should be redirected towards a different and more pressing question, namely how to better study the effect of digital media on our behavioral patterns rather than of our cognitive functions, what is the time scale of these effect, and eventually if they are reversible or not.

Luisa Fassi, PhD at the Digital Mental Health Group, University of Cambridge.

This talk continued along the line of the previous one, with the same emphasis on the link between mental health and consumption of digital media. The presentation started with a brief introduction to the concept of the *mental health spectrum*, according to which the mental health state of a single individual must be measured relatively to a continuum spectrum of values that ranges between the extremal cases of completely sane person and clinical patient. Afterwards, the evident statistical correlation between the number of clinical cases of depression disorders and the growth and development of technologies related to digital media was newly discussed, stressing once again that extracting evidence for a causal connection from this kind of data is particularly difficult. The reasons that make the task of inferring causal relations particularly problematic are summarized in two main areas.

The first area concerns the methodologies by which the data are collected. Typically questionnaires are used, and these are problematic for a number of reasons, ranging from the trustworthiness of the answers given by the participants, to the biases induced by process of sampling only a restricted number of the global population that is supposed to be studied.

The second problematic area is related to the continuum nature of the mental health spectrum, which makes the definition of clear cut quantitative measure quite difficult.

The concluding remark of the speaker is that in order to successfully deal with these experimental technical troubles and collect more meaningful data from a causal analysis point of view, the development of controlled lab digital media set ups is most important. As a practical example *small scale social networks* were cited.

Victor Rodríguez, prof. in the Artificial Intelligence group, Univ. Madrid.

Starting from the observation that machines are already integral in mediating and managing our communication systems (human-to-machine-to-human protocols), the speaker calls for an urgent need for new regulations. This need is made even more pressing by the fact that what we are living now may actually be a transitional state of things, with the end point of this transition being a state in which communication systems operate on a machine-to-machine protocol. An interesting parallel is drawn with past historical revolutions that have profoundly changed the way we think, and the rise of this new communication protocol, dubbed as the *semantic web*, is considered by the speaker as

the fourth revolution that was theorized by Luciano Floridi in 2014⁴. The main aspect of such revolution would be the way in which the perception of our-self as human individuals will irreversibly change. Understanding the consequences, implications and magnitude of this change will be a fundamental challenge to undergo in the future years.

Caroline Datchary, prof. at Toulouse University, sociologist.

This talk was focused on the effects of digitization on the quality of life in the context of a specific environment: the workplace. Some statistical studies based on surveys and questionnaires were cited, and the output of these studies is that there is an overall negative effect of digitalization on the workplace ecosystem. The speaker pointed out that companies are starting to address this phenomenon and are setting in place a number of tentative solutions. The speaker finds however that these solutions will not be effective, since they are all built on a common underlying philosophy which is deemed a failing starting point by the speaker. In particular, the main problem lies in the illusion of a central solution and the myth of autonomy of workers, and basing internal policies on these principles will only lead to a greater isolation on the workplace rather than to an organic solution. Another remark that was made, is that there are a number of mainstream concepts that should be avoided by any approach aimed at successfully improve the quality of the workplace conditions, namely *technical determinism* and *media-centrism*.

Remarks

- I had some particularly fruitful discussions with Fabrizio Silvestri, one of the participants. He introduced me to the field of Graph Neural Networks (GNNs), which I think could bear some interesting applications for our work. Also, he also gave me a quite interesting insight regarding the possible link between concepts from renormalization group theory (a very powerful technique used in theoretical statistical physics) and the inner working of these GNNs.
- One of the organizers of the workshop was David Chavalarias, who is also one of the creator of Politoscope, which is an impressive tool frequently used by french

⁴The Fourth Revolution - How the infosphere is reshaping human reality. Oxford: Oxford University Press, 2014

journalists. As suggested to me by Guido Caldarelli, I asked him if he would be interested in giving a talk for our seminars and he seemed up to it.