The future is here: Mind control and torture in the digital era

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Abstract

Torture, understood as a relationship of domination in which one person breaks the will and impedes the self-determination of another human being, taking control of all aspects of the victims' life and trying to change the core elements of their identity to the perpetrator's interests (Pérez-Sales, 2017), will increasingly come to be linked to new technologies, artificial intelligence, the use of media and internet, and to new forms of lethal and non-lethal weapons. The author reviews the implications of modern technology for the contemporary fight against torture and some of the emerging civil society initiatives that aim to face them.

Keywords: Torture, Non-Lethal weapons, Neuro-warfare, Nanotechnologies, Mind control. Surveillance Methods, Neuro-ethics, Cognitive Liberty.

Working with torture survivors: are there two parallel worlds?

When we discuss *contemporary torture*, it seems as if there are two parallel worlds. One is constituted by, let's say, "real torture", that of blows and beatings, of the dark ominous places of detention. And the other, that reflected in mostly speculative reports, is of the MK-Ultra, the laboratories of human experimentation, brainwashing and the dark world of military research institutions. Both worlds seem dissociated. When a field worker doctor or psychologist in a torture treatment centre of the Global South is told about CIA or China mind- control programmes, or about documenting threats or sleep deprivation as subtle forms of torture (Pérez-Sales, 2020, 2021), that person may read the information with a certain curiosity. But as a reality, such programmes appear light-years away from his or her daily practice of hunger, bruises, insomnia and flashbacks.

Until suddenly Guantanamo prison is among the main news on TV, and the two worlds, apparently dissociated come together. And we realise that thousands of people, ordinary citizens, have been, and are being, subjected for years to torture methods designed by psychologists and doctors, the foundation for ideas and programmes that sound like outdated Cold War relics, but which are nonetheless real: MK-Ultra, Albert Biederman, Brainwashing, Kubark Manual, and the like. Human experimentation not so far as that performed by Nazi doctors. In fact, opaque centres like Guantanamo exist and have always existed. La Libertad prison in Montevideo was a place of experimentation in psychological torture in the 1980s. There were similar centres in Brasilia and Buenos Aires, where mind-control experiments on human beings were done with British, French or North American instructors. In the 1990s, experiments on differ-

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ent forms of identity destruction were carried out in Turkey in the Kartal Special Type Prison (among others), which later gave rise to the well-known F-Type prisons. The Evin prison in Tehran has had, for more than 20 years, and is still in use, a module for experimentation with different forms of psychological torture, in the past with US and Rusian trainers, now on their own. Similar modules have been described in other countries. It seems nobody wants to be left behind in the race to delve into the limits of the human mind and will.

Torture methods: changing the outlook

Psychological torture, in the past, was based on destruction: the destruction of the body through pain, and the destruction of the mind through psychological methods of attacking self and identity.

Those methods proved to be of little practical use, except as punishment, and were not considered cost-effective by the State perpetrators. Whatever limited success such methods achieved often came at the expense of a negative social image, international isolation and a high political cost for the governments that used them. Moreover, such methods corresponded poorly with the logic of the free market and the monetisation of all aspects of society in a globalised world in which markets supplant States as social regulators.

Thus, the torture of the future will be forms of social control that are also niche markets. The destruction of body and mind will still be part of contemporary torture; but the focus of torture methods will increasingly be based on the logic of late capitalist societies.

Mind control: more than a myth?

The technological society is advancing exponentially. In 1969, the US military research agency ARPA created the first rudimentary internet. The first PC came onto the market in 1981, based on the MS-DOS system. Barely 40 years later, quantum transmission systems are becoming available and any desktop computer is capable of handling gigabytes of information in seconds. Advances in the battle for mind control have followed the same exponential growth. What only ten years ago was part of a conspiratorial universe, is today a technological reality; sometimes in animal testing models, but very often already in human experimentation or applied in small scale environments. In a very short time, there will be attempts to scale it up, and a new battle will ensue as civil society and human rights groups challenge the assault on individual liberty. Globally, this new field, which has undergone extraordinary expansion since the 1970s, has been labelled neuro-warfare (Krishnan, 2016). Part of it is Internet and Communications Ill-Treatment and Torture (ICIT) which looks specifically at how communications and social networks can be used as forms of torture, coercion and social control and reviewed elsewhere. (Pérez-Sales & Serra, 2020)

Torture is understood, in its ultimate consequences, as a relationship of domination in which one person breaks the will and impedes the self-determination of another human being, taking control of all aspects of the victims' life and trying to change the core elements of his or her identity to the perpetrator's interests (Pérez-Sales, 2017). This purpose will increasingly come to be linked to the new technologies, artificial intelligence, the use of media and internet, and to new forms of lethal and non-lethal weapons.

Controlling the body: of course pain, but not only pain

Table 1 collects a brief summary of available contemporary non-lethal weapons already in use or in experimental stage with potential use as torture devices (National Research

New Non-Lethal Weapons with potential use as torture devices	
Chemical weapons	• Incapacitating agents (e.g. CS, CN, CR, OC) used as gases or sprays • Chemicals that target neurotransmission receptors aiming to produce anxiety, submissiveness or fatigue • Chemicals that act as malodorant or produce nausea or vomiting • Chemicals that produce temporary neurotoxic paralysis.
Electro-shock devices	• All kinds of guns, projectiles, batons or belts.
Acoustic devices	• White sound that produces irritability, insomnia and anxiety • Low-frequency sound that causes headaches, disorientation and nausea. • Sound isolation devices – sound deprivation • Sound saturation devices
Light devices	• Strobe lights, dazzling lasers, flash binding lights that cause disorientation and temporal blindness
Microwave generators	• Increase water body temperature creating general or focused burning sensations

Council, 2003; Wright, 2002). Some of them are well-known and debated, like electro-shock implements (Dermengiu et al., 2008; Institute for Security Studies, 2016), sound weapons (Davison, 2009a; Volcler, 2013) or chemical riot control agents (Schep et al., 2015).

Others are less well-known, like thermal lasers, radiofrequency or directed energy devices (Joint Non-Lethal Weapons Directorate, 2011; Risling, 2006; United States Air Force Research Laboratory, 2002).

Specifically, one of the less known and most expanding areas of technological development in recent years is that of so-called *Directed Energy Weapons* (DEW). These are based on the use of different forms of distant energy emission devices (laser, radiofrequency, microwave or other) directed against an individual or focused towards specific areas within the human body (Davison, 2009b). As an instrument of coercion and torture, they can be used from a certain distance and become unaware to the victim. They also allow for continuously targeting a person. In the short term, they cause thermal pain that can be unbearable and in the medium and long-term, they can potentially cause lesions in the skin or internal organs. There are also complex behavioural effects, still under study (Davison, 2009b).

Nanotechnology and torture

Nanotechnology is the modern and rapidly expanding field of medicine that applies the use of nanoparticles (particles with a size of less than 100 nanometres [nm]) for preventive, therapeutic and diagnostic purposes. It is based on the introduction of these particles into the body through different transporters

and directing them through the bloodstream to specific targets in the human body. Nanotechnologies have applications in the fight against degenerative neurological disease, infectious processes and chemotherapy where targeted actions are sought to increase efficacy minimizing secondary effects. But in parallel, for the last 20 years, the military industry has also been researching its potential application as a powerful tool in neurowarfare (Altmann, 2004). Nanomedicine as a non-invasive strategy has enormous potential and enormous dangers, and has yet to be specifically regulated by an international treaty (Nixdorff et al., 2018). Nanoparticles do not necessarily require an injection site and can be absorbed via the skin or nasal passages. Just as an example of its potential applications, some programmes already allow for the permanent tracking of the movements of animals, a technology quite close to the conspiracy-minded ideas of many antivaccine groups.

Chemical weapons are thought of as products that can be deployed on a large scale in war contexts, such as in the case of Agent Orange gas in Vietnam (Verwey, 1977) or White Phosphorus Bombs used in Gaza or Syria (Crowley, 2016; Dando, 2015). This being true, less well-known is the development of chemicals linked to *nanotechnologies.* A recent review has found a wide array of research into aerosol-delivered toxins and neuro-regulators (Nixdorff et al., 2018). Its use has been reported in episodes of poisoning with permanent neurological damage involving Russian dissidents over the last decade. Also the use of oxytocin and other *empathic* substances and their potential applications in psychiatry and mental health are well known (Lane et al., 2013; Leppanen et al., 2018) and they have proposed as contemporary forms of truth serum (Marks, 2010; Walsh, 2014), something that, for now, is far from reality.

Neural implants

A neural implant is a device placed inside the body that interacts with neurons. In the early days these were electrodes implanted through the cortex, but over time they have evolved into microchips that require minimal surgery for implantation and do not require external power supplies. Neural implants have multiple applications in medicine, especially related to neurostimulation in motor and sensory disorders, but also epilepsy, and they are in early experimentation stage in depressive and obsessive-compulsive disorders (Costa e Silva & Steffen, 2017). This is a rapidly progressing research area in which biochips and implants are built in new and better materials that produce no tissue rejection, incorporating nanotechnologies to diminish the size and with more powerful software to control and interact with the neural system (Dabbour et al., 2021; Salari et al., 2022; Wan et al., 2021) while, again, there is no international regulation of its use (McGee & Maguire, 2007). The most important concern regarding the use of neuroimplants – not in the near future, for now - is represented by the possibility of controlling an individual's mental functions via wireless waves interacting with the electric activity of the brain. From the perspective of torture, it has been claimed that they could be used in the future to manipulate memory and emotions and to induce hallucinations and psychotic-like symptoms, among many other harmful effects (J. Illes & Hevia, 2021; Krishnan, 2016; Leung et al., 2019).

Unveiling the brain: Accessing thoughts and feelings

If anything resembles a future in which it is possible to control the human mind, it is through the hundreds of civil and military research projects on Mind-Brain interfaces and *Remote Neural Monitoring*. One step ahead of

neuroimplants, the aim of mind-brain interfaces is to impant devices that allow for wireless bi-directional communication between the brain and the external world. Under the coverage of medical projects, new generations of ever more powerful cortical modems developed by the military industry[1] are marketed and already in use in pilot experimental subjects. In its present basic form, they allow to control orthopaedic systems with the mind, but in their more advanced modalities, cortical modems allow the user to 'inject' images or sounds directly into their visual or auditory cortex[1,2] allowing blind people to partially recover their sight or the brain damaged to restore their ability to recall some memories[3], among other uses.

Different labs in Europe, Japan and the US have also developed headsets and other extrenal devices that act as *Brain-Computer Interfaces* y detecting and amplifying EEG signals, allowing patients to communicate with researchers and control external devices simply by imagining the actions of their body parts (Bates, 2021), a technology that will have many potential benefits for patients suffering neurological disorders. There are now on the market different basic portable devices that monitor electric brain activity[4,5] and electromyography signals[6] for no-touch game interfaces, emotional training and mindfulness practice, among others. Different Thought-to-Text devices are already available (Willett et al., 2021) and ready to be marketed. If EEG waves can be amplified to the point of being detected by an external device without the need of a headset or external electrodes -a possibility that will be real in a short time -, in popular terms, mind-reading and telepathy will be technologically possible (Brigham & Kumar, 2010; Vorontsova et al., 2021).

Big data, security and surveillance in law enforcement

This decade will undoubtedly be remembered as the decade of *Big Data*. The existence of super-computers with the capacity to process millions of data bytes in milliseconds and to integrate and analyse almost instantaneously databases from very diverse sources has opened the door not only to an unprecedented advertising invasion but also to the integration of databases on human beings that include and combine, for instance, biometric data, activities, movements, expenditures and opinions, among many other elements. Always in the name of security and the fight against terrorism, and pushed by the new Cold War jargon, governments approve the existence of databases with use restricted to military and law-enforcement special units over which there are few to any means of transparency or control. Such databases, in the form of anti-terrorist files of persons 'under special surveillance', have always existed. The difference is that the current databases aim to slowly include all citizens, and they are transnational in nature[7]. The citizen is confronted, once again, with the need and duty to rely on the good faith of institutions and governments. Most of these data are in the hands of private companies and police and military agencies

1 https://www.darpa.mil/news-events/2015-01-19
2 https://www.sbir.gov/node/736761
3 https://www.extremetech.com/extreme/203718-darpa-dreams-cortical-modems-and-neural-ramplants-for-restoring-active-memory
4 https://www.bitbrain.com/neurotechnology-products
5 https://www.mindtecstore.com/NeuroSky-Brainwave-Starter-Kit-EEG-Headset
6 https://store.neurosky.com/
7 https://www.politico.eu/article/eu-pushes-to-link-tracking-databases/

that often act with little political oversight.

There are many risks linked to the routine use of Big Data by law enforcement agencies, especially regarding discrimination and abuse (Guthrie, 2017). Policies for full transparency have been proposed, including, for instance, regular meetings between police, community representatives, elected leaders, technology experts, and civil liberties groups engaged in public and open information sessions (Guthrie, 2017).

Furthermore, Big Data is used to decide political strategies and design communication campaigns (Stroud & McGregor, 2019) to increase voting tendencies and get acceptance and compliance to unpopular measures.

Debates in the field of human rights about the limits of the use of Big Data paint a picture of increasingly urgent ethical awareness and action (Davis & Patterson, 2012).

Interception and control of communications is the other side of the coin of social surveillance. It seemed technologically impossible to monitor and track millions of telephones and Internet communications around the world until Edward Snowden and others unveiled Echelon, the main among other similar global surveillance networks (Cohen, 2014; Verri et al., 2014). Echelon, with an estimated 300,000 employees in 120 stations around the world, according to official figures, monitors more than three billion communications every day, 90% of Internet traffic. The information captured by Echelon feeds different Big Data databases (Lyon & Murakami, 2021).

Transhumanism: Upload brains to computers

This decade has also been called the decade of the brain. The United States launched the Advancing Innovative Neurotechnologies (BRAIN) Initiative to develop and apply new tools and technologies to the mapping and study of neural circuits, and the understanding of the neural and computational basis of behaviours, perceptions, thoughts and emotion[8] (Jorgenson et al., 2015; Koroshetz et al., 2018). New neuro-technologies fuelled by the BRAIN Initiative now allow investigators to map, monitor and modulate complex neural circuits, enabling the pursuit of research questions previously considered unapproachable (Hsu et al., 2020).

One of the most exciting (and frightening) careers in contemporary science, mostly in the private sector is, once deciphered the brain, the pursuit of methods for transferring the entire information of a human brain into a computer. There are several companies working towards being the first to achieve this goal, with Neurolink, the company owned by Elon Musk, as the most mentioned in newspapers and the media. According to Ray Kurzweil, director of engineering at Google, "we'll be uploading our entire minds to computers by 2045 and our bodies will be replaced by machines within 90 years"[9]. Neuro-ethicists debate whether, by the time this is achieved, it will transfer more than just a set of neural networks and information, or also transfer that person's consciousness, which some speculate would amount to, somehow, achieving the immortality of a person in a machine body.

8 For an introduction to Brain Mapping and its implications see the Open Access Special Issue *Cerebral cartography: a vision of its future* compiled by Semir Zeki in *Philosophical Transactions of the Royal Society – Biological Sciences* (May 2015). https://royalsocietypublishing.org/toc/rstb/2015/370/1668)

9 https://www.kurzweilai.net/daily-mail-well-be-uploading-our-entire-minds-to-computers-by-2045-and-our-bodies-will-be-replaced-by-machines-within-90-years-google-expert-claims

This possibility has spawned several think-tanks of philosophical reflection that try to promote the debate on where contemporary civilisation and the human species should evolve. An example of this was made in a proposition by the Global Future 2045's 2013 Congress which stated the goal "Towards a New Strategy for Human Evolution" in an open letter to United Nations General Secretary Ban Ki-Moon, and was debated at Oxford's Future of Humanity Institute and other institutions (Benedikter et al., 2016). Furthermore, some philosophers are developing models that speak of a coexistence of a classic labour-based capitalism with what is called new *cognitive capitalism*, in which persons will have economic value for their brain and thinking and the economical applications of the data it generates (Lushetich, 2021).

Linked to it is *transhumanism*, a branch of science devoted to enhancing (or abating) human beings by employing already existing and future technologies: artificial intelligence, robotics, cognitive science, information technology, nanotechnology, biotechnology and others reviewed here (Hofkirchner & Kreowski, 2021). While most of the field is futuristic projections, closer to science-fiction than reality, different projects of the so-called *super-soldiers* are already funded by DARPA military projects as publicly announced on their website[10]. Big Data is also used to create intelligent systems that can support military decisions in complex environments (Labbe, 2019).

10 https://www.engineering.com/story/darpas-building-a-noninvasive-neural-interface-for-soldiers

Facing the challenge: Initiatives to defend human rights in the 21st Century.

Research, documentation and advocacy initiatives

Fortunately, there are some initiatives for these new struggles of the human rights tradition that are central to the fight against torture. Amnesty Tech is a global collective of advocates, hackers, researchers and technologists that aims to "bolster social movements in an age of surveillance, challenge the systemic threat to our rights posed by the surveillance-based business model of the Big Tech companies, ensure accountability in the design and use of new and frontier technologies and encourage innovative uses of technology to help support fundamental rights"[11]. Besides publishing reports, they undertake strategic litigation cases. Human Rights Watch has created a specific research line on Technology and Rights with a team of full-time researchers that has produced both Global and Country-Specific technical reports[12,13]. There are many more[14]. Just to mention some relevant initiatives, the University of Essex created the Human Rights, Big Data and Technology Research Group[15] which has developed good practise guidelines for the digital age. The Georgetown Law Library created in 2014 a special repository on legal initiatives and reg-

11 https://www.amnesty.org/en/tech/
12 https://www.hrw.org/topic/technology-and-rights
13 Their team, by the way, was among the list of persons with their telephones infected by Pegasus malware https://www.hrw.org/news/2022/01/26/human-rights-watch-among-pegasus-spyware-targets
14 https://www.computerweekly.com/news/450400044/NGOs-challenge-UK-and-US-mass-surveillance-in-human-rights-court
15 https://www.essex.ac.uk/research-projects/human-rights-big-data-and-technology

ulations related to cyberspace and digital rights[16]. The *United Nations Educational, Scientific and Cultural Organisation* (UNESCO) has issued a set of *Recommendations on the Ethics of Artificial Intelligence*[17].

Neuro-ethics and cognitive liberty

Most of these initiatives are related to privacy concerns. Less developed is human rights research and activism related to neuroscience.

A pioneering movement linked to what was called Cognitive Liberty started more than two decades ago (Boire, 2000) as a reaction to military research on the use of fMRI and other medical devices in lie detection in the interrogation of suspects (Balmer, 2018; Poldrack, 2008). Perhaps the movement was too visionary for the time and thus did not achieve the necessary backing from civil society organisations.

Different civil society research groups are working on the ethical challenges and regulations of new neuro-technologies and neuro-warfare (Carle, 2021; Herrera-Ferrá, 2021; Judy Illes & Hossain, 2017; Salles, 2021; Yuste et al., 2021). There is a pioneering initiative of a group of neuroscientists from different countries led by the Chilean professor Rafael Yuste, Director of the Neurotechnology Centre at Columbia University, which has articulated a transdisciplinary platform that lobbies for the adoption by the United Nations General Assembly of a new charter of cognitive rights and respect for the integrity of the conscience as a fundamental and inalienable value of human beings (Goering et al., 2021; Ienca, 2021; J. Illes & Hevia, 2021; Illes & Hossain, 2017; Yuste et al., 2021). Chile, by the way, will be the first country to adopt specific national legislation on cognitive rights (Zúñiga-Fajuri et al., 2021)

In summary

Brain implants and remote Mind-Brain interfaces; the expansion of nanotechnologies as weapons targeting not only the body but also specific points in the brain; the growing development of biomarkers and massive surveillance methods; the implementation of methods to monitor emotions and thoughts in the interrogation of suspects; the development of Internet-based technologies for the manipulation of opinion and social control: these, among many others, are technological developments with potential use in manipulation of minds, cruel and inhuman treatment or torture at the individual level, and the manipulation and social and control of communities, ethnic groups or societies at a global level

The world of civil science and human rights advocacy has always advanced with a minimum of 10 years of delay in regard to the advances made by military science. Ten years may not have been that long in the past, but it may definitely be too long in the future.

And, so what?

Many of these developments in the field of the interaction between technology, medicine, sociology and other branches of sciences have undoubted potential to help humanity. But they also have enormous potential risks when ethics are subsumed to serving business interests or military or political purposes. Even more when, in relation to all these developments, deregulation in the field of human rights, is complete.

Faced with this reality, it is easy to be tempting to consider that these are conspiracy fantasies and that there is too much work

16 https://guides.ll.georgetown.edu/c.php?g=363530&p=4783483

17 https://unesdoc.unesco.org/ark:/48223/pf0000377897

to be done in our daily lives with victims of "real torture" to worry about the evolution of ill-treatment and torture. This is partly true. Without falling into apocalyptic discourses nor into naïve confidence in human kindness, these are areas to which doctors, lawyers and human rights defenders must pay attention. If we want to understand the future of torture in the years to come, those who fight against it need to evolve as rapidly as those who help to perpetrate it.

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