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Exposé

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Regulation of Digital Mental Technologies

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Introduction

In recent years, the digital exploration of the mind has experienced significant leaps. Substantial ongoing projects by brain research centres worldwide demonstrate that the (digital) mapping of the mind is a timely topic and of major interest for all big players in science and research.¹ Advancements of digital technologies, in particular the possibilities of big data and AI, have led to progress in the datafication of the human mind that only a decade ago seemed unimaginable. Along with an increased deployment of emerging technologies, such as emotion technology and neuro technology, questions arise whether our legal framework is (still) fit for purpose when facing a 'datafiable' mind.

State of the Art and Research Outline

Emotion technology and neuro technology are experiencing lightning technological progress. Collectively referred to as digital mental technologies,² they are opening up a growing market within the digital tech sector. Emotion tech is projected to grow significantly.³ Similarly, neuro tech wearables, in particular EEG-based Brain Computer Interfaces (BCIs), are entering not only the medical but also the consumer market on behalf of big tech companies.⁴ Chances are that by the end of this decade neuro tech has become a mainstream technology.⁵ Both

¹ See brain research initiatives in the USA <https://braininitiative.nih.gov/> accessed 7 February 2022
China <http://www.cebsit.ac.cn/en/> accessed 7 February 2022
Japan <https://brainminds.jp/en/> accessed 7 February 2022
and Europe <https://www.humanbrainproject.eu/en/> accessed 7 February 2022

² 'Digital mental technologies' are here referred to as technologies that aim to explore, analyse and influence data on mental states, i.e. conative, affective, emotional and cognitive states.
See also Marcello Ienca, Gianclaudio Malgieri, 'Mental data protection and the GDPR' (2021) < <https://dx.doi.org/10.2139/ssrn.3840403> > accessed 13 September 2021

³ Desmond John P. (2021): 'Market for Emotion Recognition Projected to Grow as Some Question Science', In: AI Trends (24 June 2021) <https://www.aitrends.com/emotion-recognition/market-for-emotion-recognition-projected-to-grow-as-some-question-science/> accessed 8 February 2022

⁴ Melissa Heikkilä, 'Machines can read your brain. There is little that can stop them.' Politico (31 August 2021) < <https://www.politico.eu/article/machines-brain-neurotechnology-neuroscience-privacy-neurorights-protection/> > accessed 13 September 2021

⁵ See Ruairie Mackenzie, 'Privacy in the brain: The Ethics of Neurotechnology' Technology Networks (21 August 2021) < <https://www.technologynetworks.com/neuroscience/articles/privacy-in-the-brain-the-ethics-of-neurotechnology-353075> > accessed 14 September 2021

technologies are increasingly deployed in a number of sectors, such as mental health, marketing/advertising/retail, gaming, smart products, employment, education and law enforcement.

The information processed by digital mental tech is inherently intimate. The findings do not only serve to track a status quo but can also be used to predict or even manipulate future behaviour. Inaccurate results can lead to discrimination and severe legal damages. Moreover, the mere idea of having one's thoughts and emotions read by third parties, without being aware of it or against one's consent, adds a certain creep factor.

Concerns about the legal and ethical implications of the deployment of digital mental tech have therefore surfaced. Emotion technology, on the one hand, has appeared on the legal landscape and in the regulatory debate very recently. Among the first to notice the potentials and risks of emotion tech was the European Commission's Bohemia Study (2018). The Bohemia Study is the 'main EU strategic foresight study'⁶ in support of the Commission's proposal for the Horizon Europe research programme. In the Bohemia Study, 'Emotional intelligence online' was identified as one out of 19 future scenarios, and the development of 'standards and codes of behavior concerning the use of individuals' emotions for commercial and public purposes, as well as for emotional data sharing and privacy' were recommended.⁷

Scholarly reflections about the legitimacy and the ethics of neuro technology, on the other hand, date already back some decades.⁸ A legal subfield called 'neuro law' has evolved and has engaged in scholarly debates over old and new legal concepts with regard to neuro tech.⁹ The

⁶ See European Commission, 'Beyond the Horizon. Foresight in support of future EU research and innovation policy (BOHEMIA)' < https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/foresight/bohemia_en > accessed 29 January 2022

⁷ European Commission, 'Emotional Intelligence Online. Targeted scenario N° 7. Glimpses of the future from the BOHEMIA study' (2018), p. 7.

⁸ Ienca Marcello (2021): On Neurorights. *Frontiers in Human Neuroscience*, 24 September 2021, <https://doi.org/10.3389/fnhum.2021.701258> accessed 8 February 2022

⁹ See only the last decade:

Spranger, Tade Matthias (ed.) (2012): 'International Neurolaw. A Comparative Analysis.' Springer.

Picozza Eugenio (ed) (2016): 'Neurolaw. An Introduction.' Springer.

D'Aloia Antonio and Errigo Maria Chiara (eds.) (2020): 'Neuroscience and Law. Complicated Crossings and New Perspectives', Springer.

Brożek Bartosz, Hage Jaap, Vincent Nicole (eds.) (2021): 'Law and Mind. A Survey of Law and the Cognitive Sciences', Cambridge University Press.

Ligthart Sjors, Toor Dave van, Kooijmans Tijs, Douglas Thomas, Meynen Gerben (eds.) (2021): 'Neurolaw. Advances in Neuroscience, Justice & Security', Springer.

focus of traditional neuro law research lies on questions regarding fundamental rights' infringements and implications for the judiciary system. As outlined by neuro legal scholars, emerging mental technologies touch upon a number of fundamental rights, which are deeply enshrined in European primary law, such as in the Charter of Fundamental Rights¹⁰ (hereinafter referred to as 'CFR'). Next to the right to respect for private and family life (Art 7 CFR), the right to the protection of personal data (Art 8 CFR), and European anti-discrimination and equality law (Chapter 3 of the CFR), these principles encompass the right to integrity of the person (Art 3(1) CFR includes verbatim the right to mental integrity), the freedom of thought, conscience and religion (Art 10 CFR), and the general legal principle of the right to remain silent and not to incriminate oneself ('nemo tenetur se ipsum accusare'). Ultimately, all the above-mentioned fundamental rights build upon the right to human dignity (Art 1 CFR), which might be at stake when facing technologies that have the potential to alter a person's identity, autonomy, agency and privacy as pointed out regularly by neuro ethicists.

Arguing that new technologies pose new challenges and therefore need new laws, neuroscientist scholars have recently been very active in demanding legal responses to the advancements in digital mental tech.¹¹ They are promoting the implementation of new rights within the catalogue of traditional rights.¹²

Their ambitions are driven by genuine concern about the future risk of technological advancements in the field. Rafael Yuste, Chair of the NeuroRights Foundation and professor of Biological Sciences and Neuroscience at the Columbia University in New York, recently gave an interview to the Unesco Courier. His statement there certainly spurs the imagination: 'The idea is that, instead of having it in your pocket, the iPhone of the future will be wearable on your head, or maybe a chip implanted inside your brain. When this happens, the data that is collected by this BCI technology will become the property of the company, because there is no regulation.'¹³

¹⁰ Charter of Fundamental Rights of the European Union (2016/C 202/02)

¹¹ See e.g. The Neurorights Foundation <https://neurorightsfoundation.org/> accessed 9 March 2022

¹² For example, they promote the implementation new 'neuro rights', such as 'mental privacy', the right to 'personal identity', 'free will', 'fair access to mental augmentation', and 'protection from bias'. See <https://neurorightsfoundation.org/mission> accessed 10 March 2022.

¹³ Dare Jenny (2022): Rafael Yuste: "Let's act before it's too late". The Unesco.Courier 2022-1 <https://en.unesco.org/courier/2022-1/rafael-yuste-lets-act-its-too-late> accessed 9 March 2022

Considering how juicy the larger topic of mind reading is, it comes as no surprise that the media are noticing their calls.¹⁴ Moreover, policymakers and lawmakers are becoming susceptible for the promotion of new rights. International organizations have started addressing the topic.¹⁵ First responses *de lege ferenda* have started the legislative procedure: The European Commission is answering the call for regulation of emotion tech in their recently proposed Artificial Intelligence Act (hereinafter referred to as ‘AIA’)¹⁶ by defining emotion recognition systems and qualifying them as medium risk AI system (Art 3(34) in conjunction with Art 52 AIA). In Chile, the Chamber of Deputies approved an amendment to the Constitution with regard to neuro rights and adopted a Bill of Law for Neuroprotection, which is waiting to be signed into law by the president.¹⁷

¹⁴ See e.g. Wild Kate (2021): ‘Our notion of privacy will be useless’: what happens if technology learns to read our minds? The Guardian (6 November 2021) <https://www.theguardian.com/technology/2021/nov/07/our-notion-of-privacy-will-be-useless-what-happens-if-technology-learns-to-read-our-minds> accessed 10 March 2022

AFP (2021): Mindblowing: advances in brain tech spur push for 'neuro-rights' France24 (4 May 2021) <https://www.france24.com/en/live-news/20210504-mindblowing-advances-in-brain-tech-spur-push-for-neuro-rights> accessed 10 March 2022)

Asher-Schapiro Avi (2021): Out of my mind: Advances in brain tech spur calls for 'neuro-rights' Reuters (29 March 2021) <https://www.reuters.com/article/us-global-tech-lawmaking-analysis-trfn-idUSKBN2BL1RH> accessed 10 March 2022

¹⁵ The OECD has adopted a ‘Recommendation on responsible innovation in Neurotechnology’ as a first standard in the domain in 2019. See OECD, ‘Recommendation of the Council on Responsible Innovation in Neurotechnology’ (2019) < <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0457> > accessed 14 September

The Council of Europe has initiated a strategic action plan on the ethics of biomedicine including a chapter on embedding human rights in the development of neuro tech.

<https://www.coe.int/en/web/bioethics/assessing-the-relevance-and-sufficiency-of-the-existing-human-rights-framework-to-address-the-issues-raised-by-the-applications-of-neurotechnologies> accessed 14 September 2021

In September 2021, the Secretary General of the UN stressed in his report that there is an evident need to update or clarify human rights frameworks and standards regarding neuro technology.

UN, ‘Our Common Agenda – Report of the Secretary-General’ (2021) p 33 <

https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf > accessed 14 September 2021

¹⁶ Proposal for a Regulation laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). COM/2021/206 final.

¹⁷ Guzmán H. Lorena (2021): Chile: Pioneering the protection of neurorights

At the same time, scholars criticize a possibly overhasty implementation of such new rights. The introduction of new rights requires a sound dogmatical assessment of the prevailing laws and the precise carving out of potential shortcomings (if there are), so the criticism.¹⁸

From a digital law perspective, the quote in the above-cited interview in the Unesco Courier proves to be problematic in many ways, starting from the conception of data as property, which as such is not supported by EU Law, to the very idea that there are no regulations for data collection by BCIs.

In an attempt to contribute to the ongoing debate on whether or not emerging digital mental technologies require new laws, this thesis aims to assess the European legal framework in the main sectors of deployment.

Digital mental technologies deployed in medical products enjoy, for example, a very high level of regulation and have to meet strict requirements. In comparison, the requirements for ‘mere’ consumer health products appear significantly lower. Given the remarkably permeable grey zone between the two regimes and the intimate nature of the data processed, the question arises if there might be indeed gaps or shortcomings that need further or stricter regulation.

The data processing in both types of products, medical products and consumer health products, however, is united by one decisive circumstance: the data subjects themselves actively decide to use the application (or actively follow the recommendation of their psychiatrist/psychotherapist); the processing of their data consequently happens, if under very heterogenic conditions, with their consent.

Simultaneously, digital mental technologies are deployed increasingly in contexts where the party using the application and the data subject fall apart. While in the above-noted scenario people are affected by digital mental tech on a voluntary basis as patients or consumers and with their consent, here, a growing number of people is affected involuntarily, in many cases beyond their awareness, perhaps against their will and at times even against their interest (e.g. dark patterns). The question of consent acquires a new dimension in these contexts. Fields with

¹⁸ See Bublit, Jan Christoph (2022): Novel Neurorights: From Nonsense to Substance. *Neuroethics* (2022) 15:7, <https://doi.org/10.1007/s12152-022-09481-3> accessed 7 March 2022
Diego Borbón and Luisa Borbón (2021): A Critical Perspective on NeuroRights: Comments Regarding Ethics and Law. *Frontiers in Human Neuroscience*, 25 October 2021
<https://doi.org/10.3389/fnhum.2021.703121> accessed 8 March 2022

such a disintegration of the user and the data subject include e.g. targeted advertising, education/employment or law enforcement.

Companies are, for example, intrigued to include emotion tech features in their advertising algorithms. Emotions serve as primary filters for human perception, they affect human behaviour and decision-making, hence, they are driving forces for every purchase decision. Targeted advertising provides consumers with more relevant and better-suited information and allows companies to tailor their offers more specifically. At the same time, targeted advertising triggers concerns about privacy, data protection and discrimination.¹⁹ The potential for misleading or exploitative deployments of digital mental tech is arguably high.

In educational and employment contexts, the deployment of digital mental tech is equally expanding, and it is tarnished by similar fundamental rights' concerns.²⁰

The sector of law enforcement is yet another sector that is susceptible for the deployment of digital mental tech. The idea of lie detectors, to name only one possible deployment, has been appealing to law enforcement for decades, if not centuries. The EU itself has funded research programmes for border control, such as iBorderCtrl,²¹ using digital mental tech to reveal possible deceptive intentions. China reportedly is using emotion tech in prisons, detention centres and remand facilities²² as well as against minorities.²³ However, the legal regime for deployments in law enforcement contexts is yet again different from the ones mentioned above.

¹⁹ See e.g. Fourberg Niklas et al (2021): Online advertising: the impact of targeted advertising on advertisers, market access and consumer choice. At a glance. Study requested by the IMCO committee of the European Parliament. [https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/662941/IPOL_ATA\(2021\)662941_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/662941/IPOL_ATA(2021)662941_EN.pdf) accessed 4 April 2022

²⁰ See e.g. Article 19 (2019): 'Emotional Entanglement. China's emotion recognition market and its implication for human rights' <https://www.article19.org/wp-content/uploads/2021/01/ER-Tech-China-Report.pdf> accessed 8 February 2022

²¹ Nezik Ann-Kathrin (2020): Falsch geblinzelt. Die Zeit (29 August 2020). <https://www.zeit.de/2020/36/iborder-ctrl-luegen-detektor-software-algorithmus-forschung-kritik> accessed 16 March 2022

²² Standaert Michael (2021): Smile for the camera: the dark side of China's emotion-recognition tech. The Guardian (3 March 2021) <https://www.theguardian.com/global-development/2021/mar/03/china-positive-energy-emotion-surveillance-recognition-tech> accessed 16 March

²³ Wakefield Jane (2021): AI emotion-detection software tested on Uyghurs. BBC News (26 May 2021) <https://www.bbc.com/news/technology-57101248> accessed 16 March 2022

Taking therefore into account the different circumstances of deployment and the different legal considerations following thereof, the thesis will carefully analyse the legal regimes in the main sectors of deployment. The General Data Protection Regulation, as the most relevant piece of European *lex lata* for the protection of personal data, and the draft AIA, as the European role model for new *lex ferenda* responding to emerging data-driven technologies, will serve as main points of reference throughout the legal analysis. In addition, the respective applicable and upcoming sectoral laws will be analysed with regard to the regulation of digital mental tech.

The envisaged study is not only timely considering the advancements of emerging technologies (as suggested by neuroscientists) but also the development of European law, in particular the legislative initiatives in European digital law and European consumer law. The EU has set out to become a global power for digital regulation. Draft laws, such as the AIA and the Digital Services Act Package²⁴, have been proposed by the European Commission with the intention to substantially shape the regulatory landscape in Europe and beyond. Moreover, the Commission has expressed strong ambitions to strengthen consumer rights by adopting the European consumer agenda as a strategic vision on consumer policy.²⁵

Together with the applicable laws already in place, these strategic and regulatory endeavours will have to stand the test whether European regulation is fit for purpose with regard to digital mental tech. Only then, the question of whether or not new or adapted provisions are required can be addressed and further policy options can be explored.

²⁴ See also European Commission: Digital Services Act Package. <https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package> accessed 4 April 2022

²⁵ See also European Commission (2020): New Consumer Agenda: European Commission to empower consumers to become the driver of transition. https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2069 accessed 16 March 2022

Structure

- I. Introduction
- II. Technology behind digital mental tech
- III. Calls for new rights for digital mental tech and first legislative responses
- IV. User and data subject are identical
 - 1. Qualification of Data
 - a. Health data
 - b. biometric data in a narrow sense
 - c. biometric data in a broad sense
 - d. non-biometric data
 - 2. Qualification as medical product/service vs consumer health product/service
 - a. Qualification as medical product/service according to intended purpose by the manufacturer
 - b. Qualification as medical product/service according to other indicators?
 - 3. Legal regime following thereof
 - a. Sensitive data vs non-sensitive data
 - b. Medical product/service vs consumer health product/service
 - c. Minimal / medium / high risk AI systems
 - d. Deployment for children under-age
- V. User and data subject are not identical
 - 1. Potential infringements of fundamental rights
 - a. Privacy
 - b. Data protection
 - c. Non-discrimination law
 - 2. Legal regime for
 - a. Advertising
 - i. Targeted advertising/personalized pricing
 - ii. Deployment for children under-age
 - iii. Digital mental information as non-personal data (e.g. supermarkets, advertisement boards, metro stations)
 - b. Educational/employment context

c.Law Enforcement

- VI. Integration of the findings into the ongoing debate about new or adapted rights, policy options
- VII. Conclusion

Research questions

- What does the legal framework according to prevailing and upcoming law provide for digital mental tech in sectors where the user of the application and the data subject are identical?
- What does the legal framework according to prevailing and upcoming law provide for digital mental tech in sectors where the user of the application and the data subject are not identical?
- What conclusions can be drawn from the findings with regard to the demand for new or adapted rights?

Timeline

SS 2022: Writing of the thesis

WS: 2022/23: Writing of the thesis

SS 2023: Writing of the thesis

WS 2023/24: Writing of the thesis

SS 2024: Finish writing of the thesis, review of entire thesis

September 2024: Defensio

Methodology

The thesis will be based upon desk top research and explore existing and draft law within the legal framework of the EU. It will reflect scholarly work, regulatory guidance and opinions such as by the Article 29 Working Party and the European Data Protection Board. Relevant studies and reports by research groups and non-governmental organisations on the topic, and take into account technological and legal developments as far and as long as possible over the duration of the working period on the thesis. Soft law and policy instruments (e.g. declarations, recommendations, conventions) will be taken into consideration and cited where relevant. Possibly related court decisions will be reflected where available, relevant and necessary.

Relevant literature

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