The Prohibited Artificial Intelligence Practice

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The research strives to provide a comprehensive understanding of the regulation of Artificial Intelligence (AI), known as the AI act of the European Union, with a specific focus on the regulatory challenges related to the prohibition of AI systems that deploy subliminal techniques. To achieve this, the author proposes the perspective of metaverse to enhance the user experience and biometric psychography to avoid reality eye-tracking-based models. However, the current AI act needs to be prepared to address biometrics, which merely repeats the GDPR, giving a hand to AI market growth. Regardless, the author offers four key contributions. Firstly, it shows up a course on the prohibition of AI systems contrasting to the pupillometry market that strive for an opposite course. Secondly, it clarifies the image of subliminal techniques beyond a person's consciousness of Article 5 para 1 point (a) with reference to the 'vulnerability' urge as per point (b). Thirdly, the research compiles perspicuity of 'psychological harm' criterion through the assessment of case law practice. Finally, it proposes to fill the gaps in privacy especially when the AI system initially appears friendly but becomes tracking. To support this outcome, the manuscript refers to biometric psychography expanding the concept of biometric data for AI systems.

***Keywords**: subliminal techniques; consciousness; material distortion; psychological harm; biometric psychography.*

Research Problem Formulation

The Artificial Intelligence (AI) act [1] is 'a good moment to take stock of what it can do and what as individuals and as a society we want it to do' [2]. According to AI act Article 5 para 1 point (a), 'the placing on the market, putting into service or use of an AI system that deploys subliminal techniques beyond a person's consciousness in order to materially distort a person's behaviour in a manner that causes or is likely to cause that person or another person physical or psychological harm' — prohibited. Although the AI act defines the concept of an AI system, it fails to provide clarity on what is prohibited and, indeed, generalised law-making 'playground' with (1) 'subliminal techniques' and (2) 'beyond a person's consciousness' and (3) 'material distortion of a person's behaviour' and (4) 'psychological harm' criteria that are lack of interpretation [3].

Analysis of Essential Researches and Publications

Depending on the circumstances regarding its specific application and use, artificial intelligence may generate risks and cause harm (material or immaterial) to public interests and rights protected by Union law [4]. Risk factors include one's temperament and character, particularly traits involving 'obsession/absorption, novelty seeking/impulsivity, and harm avoidant/dependent traits' [5] as well as a poor mood, anger, and aggression [6]. Also, these traits are positively associated with physiological addiction, as well [7].

1 Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union legislative acts. Brussels, 21.4.2021. 206 final. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

2 Bailenson J. Experience on Demand: What Virtual Reality is, How It Works, and What It Can Do. New York : W.W. Norton & Company, 2018.

3 The author warns that other critical criteria from the article in question should have been explored. While the manuscript does not reject them, it merely leaves room for further exploration by other academics. For instance, this chapter does not investigate the 'physical harm' capping research by the extended use of immersive AI systems that practice biometric psychography for active visual exploration. The research interest lies about a matter of how eye movements and pupil responses are related to high-level cognition and the neural pathways when AI systems control them, causing arousal and mental disorder having both reflexive and voluntary action properties, either triggered by an external AI stimulus system or spontaneously under the human factor. In this regard, individuals' psyches are at risk when they experience related AI systems. Furthermore, compared to physical harm, which forensic experts often identify as apparent harm, physiological is more unstable and finite. It is usually assessed by the court on a case-by-case basis, often dealing with cases of moral damages under the evaluation of numerous relationships to AI experience for further compensation. In addition, the article in question employs the wording 'or' rather than 'and' giving a ground psychological harm to be considered apiece and vice versa, which also means that one disservice is enough for the interrelated AI systems to be banned.

4 AI Act. Recital 4. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

5 Koo H. J., Kwon J.-H. Risk and Protective Factors of Internet Addiction: a Meta-Analysis of Empirical Studies in Korea. *Yonsei Medical Journal*. 2014. No 55 (6). Pp. 1705. DOI: 10.3349/ymj.2014.55.6.1691 (date accessed: 25.08.2023).

6 Goltz N., Dowdeswell T. The imaginationless generation: lessons from ancient culture on regulating new media. Leiden: Brill Sense, 2019. Pp. 17.

7 Ibid.

Recital 8 of the AI act defines remote biometric identification systems as AI systems used for identifying people from a distance by comparing their biometric data with data in a reference database. Unlike static measurements or images, AI techniques can track user movement over time and record environmental changes that may impact the user's behaviour and emotions. Furthermore, there are two types: 'real-time' and 'post' systems. Real-time systems capture, compare, and identify biometric data instantly or with minimal delay using live or near-live footage. On the other hand, post systems compare and identify data after a significant delay using pre-existing material like pictures or video footage from closed-circuit cameras or private devices. Regardless, the AI gather and retain biometric data beyond the scope of its identifiers.

In virtual reality, the emotion recognition system [8] uses eye tracking and pupillometry to capture user gaze data and emotional responses to stimuli. Eye tracking and pupillometry are two examples of identifying people commonly used in AI technology, which entangles measuring physiological responses and biometric data to gain insights into a person's unique traits and behaviours. By tracking a user's eye position, it is possible to identify what has visual salience to them, how much attention they pay to particular objects or events, and the path of their gaze. Thus, it involves measuring a persons' eye movements and focusing points to understand what they are looking at. Pupillometry measures changes in pupil diameter as a response to cognitive processing and can also be combined with measurements of facial muscles and pupil reactions to gauge emotional responses and revealing information about a person's perception, language processing, memory, decision-making, and emotion 'that causes or is likely to cause that person or another person physical or psychological harm' [9] prohibited by the AI act. Pupil size is controlled by two pathways that, although interconnected, are often considered distinct: the parasympathetic constriction and the sympathetic dilation pathways [10]. This data can be combined with other biometric data to gain insights into a user's emotional state, sexual attraction, or propensity for developing certain illnesses.

Accordingly, eye tracking is becoming increasingly important for legal protection, with a foveated rendering as a key element in enhancing immersive experiences. The ability to capture personal information through eye tracking and pupillometry has raised concerns about privacy and data protection. The potential consequences of merging data sets in immersive technology are not limited to a data breach. The field of pupillometry serves as a powerful example of this due to the ability of the biometric categorisation system [11]. According to the theory of revealed preferences, observed privacy choices can be seen as a straightforward expression of valid privacy preferences. Measuring hidden facts, like a user's sexual orientation, poses the risk of enriching commercial profiles. At the same time, the threat of self-censorship

8 AI act, Article 3 (34) defines an emotion recognition system as an AI system to identify or infers the emotions or intentions of natural persons based on their biometric data.

9 AI Act. Article 5 (1 (a)). URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

10 Mathot S. Pupillometry: Psychology, Physiology, and Function. *Journal of cognition*. 2018. No 1(1). 16. Pp. 3. DOI: 10.5334/joc.18 (date accessed: 25.08.2023).

11 AI Act. Article 3 (35) declares that a biometric categorisation system means an AI system to assign natural persons to specific categories, such as sex, age, hair color, eye color, tattoos, ethnic origin, or sexual or political orientation, based on their biometric data.

looms as users may be compelled to limit their thoughts, feelings, and expressions to prevent the monetization or research of their innermost preferences [12]. Accordingly, the privacy paradox is seen as an artifact of comparing two very different things: attitudes and behaviour [13]. As these practices become more prevalent in AI, users may become more guarded about self-censoring their innermost thoughts and emotions. Even if users attempt to self-censor, the subconscious nature of many of these factors may render such endeavours futile. It is essential to regard the AI act for biometrics designation and ensure that privacy and data protection are prioritized as pupillometry AI market continues to grow and evolve. This presents a profound dilemma as performance on seemingly innocuous tasks, such as VR [14] games, because such products may reveal details 'which are unrelated to the contexts in which the data was originally generated or collected health privacy laws,' [15] and therefore would not be allowed on the market. Hence, the AI act significantly regard the ethical implications 'including the principle-based requirements that AI systems should comply with' [16].

In light of the speed of technological change [17], when third-party or direct developers integrate different data sets in unanticipated or harmful ways, it can expose user data not intended to be revealed or consented to. Companies may be vulnerable to violating user trust without clear legal restrictions or constraints. As per Recital 10 of the AI act, it applies to all providers of AI systems, still of whether they are founded in the EU or a third country, to ensure equal protection of individual rights and freedoms, particularly within the application of AI systems in a non-discriminatory manner. The same concern relevant to the government and/or corporate use of VR in projects like B2G [18] or B2B [19], where

12 Hermstrüwer Y. Contracting Around Privacy: The (Behavioral) Law and Economics of Consent and Big Data. *Journal of Intellectual Property, Information Technology and Electronic Commerce Law*. 2017. No 8. Pp. 16. URL: https://ssrn.com/abstract=3059639 (date accessed: 25.08.2023).

13 Ibid.

14 According to the dictionary virtual reality (VR) a technology that allows the user to interact with a three-dimensional computer-simulated environment. In a VR experience the user inhabits the virtual world via an avatar, an icon or figure that stands in for the user. The avatar is usually controlled using special electronic equipment such as a helmet with a screen inside (to create an immersive effect) and gloves fitted with sensors; full bodysuits can also be used. VR can be accessed via state-of-the-art headsets such as the Oculus Rift (owned by Facebook) or via budget versions such as Google Cardboard, which creates a VR headset from a mobile phone. The technology was initially developed in computer games, medical science, pilot training, and computer-aided design, and its relation to film is still being figured out. Virtual reality is distinct from augmented reality (AR), which consists of a mediated view of a real-world environment enhanced with CGI, sounds, smells, and other stimuli. Certain countries, regions, and cities have specialized in the technology, with London, Los Angeles, and Quebec now key locations for VR development.

15 AI Act. Article 5 para 1 (c, (i)). URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

16 Ibid. 1.1. Reasons for and objectives of the proposal.

17 Ibid.

18 B2G. A Dictionary of the Internet. Oxford University Press, 2019. DOI: 10.1093/acref/9780191884276.001.0001 (date accessed: 25.08.2023).

19 *See* Lilien G. L. The B2B Knowledge Gap. *International journal of research in marketing*. 2016. No 33 (3). Pp. 543—556. DOI: 10.1016/j.ijresmar.2016.01.003 (date accessed: 25.08.2023).

AI is employed for interrogations, antibias, and antiharassment training to meet stipulated non-discriminatory criteria for further placing AI technology on the market. Although biometrics regimes in the European Union focus on definite prohibition to uniquely identifying details as also seen from GDPR Article 9 (1), on the other hand, the AI act assumes to have more attractive application for business as far as the innovations do not go beyond relevant conditions of Article 5 (1) AI act.

It remains to be seen how the newest state-level solitariness regime of the AI act will impact consumers. Products that allow consumers to voluntarily limit the sale of their data may significantly change AI, as new types of data sets and personal transmissions are emerging alongside the medium's growing popularity. The last one is the most important advantage — a data structure that ensures we capture information consistently across all contributors — when digital tools make processes more efficient and effective [20]. At the same time, with digital tools, all data are centralized [21]. Developing a standardized legal framework is a flawless course to safeguard user data, and privacy is major, especially considering the possibility of unanticipated and injurious data integration. To mitigate risks associated with biometric data, it should be stored solely on the user's device and transmitted only when essential. Access to information in immersive technology should require a warrant and only be done in extraordinary circumstances. For example, to deploy warehouse robots, warehouses can be designed so that robots can navigate through their predictable environment and identify, pick, and transfer warehouse items for shipment in coordination with warehouse workers [22]. However, in social networks, there is a risk that users might confound control vis-à-vis other users and control vis-à-vis the company [23]. Giving users control over the visibility of personal information for other users might trigger the illusion that the company is not tracking them [24]. A solution would be to permit the manufacturer to roll out the engine and then introduce regulation if and when the need arises [25]. Additionally, users must be adequately instructed about the implications of collecting their data to make informed decisions about their privacy [26]. It is challenging to inform users about the full implications of collecting their data, particularly regarding involuntary bodily indicators of emotional responses, mental state, or health, talking about truthfulness, inner feelings, and arousal. The absence of a robust legal framework in this domain could allow companies to utilize such information without adequate regulation, thereby posing significant privacy concerns. Therefore, studying how fine-grained task characteristics and the

20 Jakupak T., Bregeš Ž. Digitalization: Balance and protection — state-of-the-art. *InterEU Law East*. 2020. No 7 (2). Pp. 196. DOI: 10.22598/iele.2020.7.2.8 (date accessed: 25.08.2023).

21 Ibid.

22 Ibid.

23 Hermstrüwer Y. Op. cit. Pp. 23. URL: https://ssrn.com/abstract=3059639 (date accessed: 25.08.2023).

24 Ibid.

25 Kołacz M. K., Quintavalla A., Yalnazov O. Who Should Regulate Disruptive Technology? *European journal of risk regulation.* 2019. No 10 (1). Pp. 10. DOI: 10.1017/err.2019.22 (date accessed: 25.08.2023).

26 AI Act. Article 52 (2): *'Users of an emotion recognition system or a biometric categorisation system shall inform of the system's operation the natural persons exposed thereto'.* URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

operating environment influence conformity to AI techniques is demanded [27].

The use of biometric data in artificial intelligence presents a complex and contested issue in terms of data protection because of the content moderation based on the natural feel of visceral content in virtual spaces. While companies may argue that collecting and analysing biometric data can lead to more personalized and efficient services, there are concerns over the potential misuse of this data, particularly in the context of data stream market consequences. This ambiguity could lead to difficulties in regulating the use and storage of biometric data, particularly as new AI capabilities emerge. In the view of the research, in this scenario there is a gamble that such data could be exploited 'to ensure the establishment and functioning of the internal market' [28] for commercial revenue when companies continue to develop more sophisticated algorithms to analyse and predict users' behaviours and emotions. Biometric categorisation and emotion recognition categories comprise mainly 'transparency' risk applications and comprises high-risk use cases that could be prohibited but only under certain application areas, [29] unlike GDPR, which prohibits biometrics in principle. The only 'minimal' risk application is the interactive emotional art use case, which is free from 'transparency' commitments in light of the right to freedom of the arts (Article 52(3)) [30]. The proposed classification as limited-risk or high-risk AI systems in the draft AI act, rather than prohibiting their use, could normalize or even legitimate the use of these scientifically unfounded systems contravening fundamental rights and democratic values [31].

Article Purpose

It is difficult to point or conceive of a concrete AI system that deploys subliminal techniques [32]. Thus, the research seeks to provide clarity on the way to compliance with novel AI act, therefore, aims to explore and define arrangement of four above mentioned (look the problem formulation part) criteria interpreting and defining them (i) allowing compliant systems to be placed on the market, put into service, or used, and giving an understanding to what extent (ii) contradictory systems shall be banned. In cases where (iii) AI systems are questionable, they should be subject to review and additional inspections. The author believes, the placement on the market, putting into service, or using such systems should be suspended until compliance is achieved.

27 Upreti A., Sridhar V. Artificial intelligence and its effect on employment and skilling / Data-Centric Living: Algorithms, Digitization and Regulation. Ed. V. Sridhar. London : Routledge, 2022. Pp. 34.

28 AI Act. 2.1. Legal basIs. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

29 Hupont I., Tolan S., Gunes H., Gómez E. The landscape of facial processing applications in the context of the European AI Act and the development of trustworthy systems. *Scientific Reports.* 2022. No 12 (1). Pp. 10688. DOI: 10.1038/s41598-022-14981-6 (date accessed: 25.08.2023).

30 Ibid.

31 Barkane I. Questioning the EU Proposal for an Artificial Intelligence Act: The Need for Prohibitions and a Stricter Approach to Biometric Surveillance1. *Information Polity*. 2022. No 27 (2). Pp. 159. DOI: 10.3233/IP-211524 (date accessed: 25.08.2023).

32 Neuwirth R. J. The EU Artificial Intelligence Act: regulating subliminal AI systems. Abingdon, Oxon: Routledge, 2023. Pp. 25.

Main Content Presentation

1. An individual's behaviour

1.1. Subliminal techniques

It has been claimed that subliminal stimuli [33] can influence behaviour [34]. Such influences are not perceptually subliminal, yet still subliminal in their influence [35]. The ability to control our actions and act according to our intentions is crucial to the human experience. However, whether the emotional cues we are unaware of affect our higher cognitive functions is unclear [36]. Paraliminal perception is the threshold for information that lies beyond our sensory abilities or within our sensory abilities but beyond the cognitive abilities of the mind to detect [37]. The EU has already taken measures to protect itself from subliminal manipulation through existing legislation. For instance, the Audiovisual Media Services Directive[38] Article 9 (b) prohibits subliminal techniques in commercial audiovisual communications. Also, the Digital Services Act [39] in Recital 67 [40] addresses the use of dark patterns by

33 *See* Brooks S. J., et al. Exposure to Subliminal Arousing Stimuli Induces Robust Activation in the Amygdala, Hippocampus, Anterior Cingulate, Insular Cortex, and Primary Visual Cortex: A Systematic Meta-Analysis of fMRI Studies. *NeuroImage* (Orlando, Fla.). 2012. No 59 (3). Pp. 2962—73. DOI: 10.1016/j.neuroimage.2011.09.077 (date accessed: 25.08.2023) ; Dixon N. F. Subliminal perception: the nature of a controversy. London : McGraw-Hill, 1971.

34 Franklin M., Ashton H., Gorman R., Armstrong S. Missing Mechanisms of Manipulation in the EU AI Act. University College London, Aligned AI, Oxford, 2022. URL: https://journals.flvc.org/FLAIRS/article/view/130723/133924 (date accessed: 25.08.2023).

35 Ibid.

36 To investigate this, Parkinson J., et al. (2017) conducted a study where the team used subliminal emotional faces to manipulate participants' decisions to act. In a new version of the Go/NoGo task, participants responded to Go targets, withheld responses to NoGo targets, and made free choices about whether to respond to Choice targets. The experiment found that subliminal angry faces made participants more likely to withhold their response in intentional trials, while happy and fearful faces had no effect.

37 Neuwirth R. J. Op. cit. Pp. 20.

38 Directive (EU) 2018/1808 of the European Parliament and of the Council of 14 November 2018 amending Directive 2010/13/EU on the coordination of specific provisions laid down by law, regulation, or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive) given changing market realities PE/33/2018/REV/1 OJ L 303, 28.11.2018. Pp. 69—92. URL: https://eur-lex.europa.eu/eli/dir/2018/1808/oj (date accessed: 25.08.2023).

39 Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act) PE/30/2022/REV/1 OJ L 277, 27.10.2022. Pp. 1—102. URL: https://eur-lex.europa.eu/eli/reg/2022/2065/oj (date accessed: 25.08.2023).

40 Digital Service Act, Recital 67: *'Dark patterns on online interfaces of online platforms are practices that materially distort or impair, either on purpose or in effect, the ability of service recipients to make autonomous and informed choices or decisions. Those practices can be used to persuade the service recipients to engage in unwanted behaviours or undesired decisions that have negative consequences for them. Providers of online platforms should therefore be prohibited from deceiving or nudging recipients of the service and from distorting or impairing the autonomy, decision-making, or choice of the recipients of the service via the structure, design, or functionalities of an online interface or a part thereof. This should include, but not be limited to, exploitative design choices to direct the recipient to actions that benefit the provider of online platforms but which may not be in the recipients' interests, presenting*

regulating practices (in a prohibited course) that may impair the ability of recipients to make informed and autonomous decisions.

Also, the research has shown, the operation of AI algorithms relies on feedback loops and may never 'know' when it is 'right' [41]. Alternatively, 'backpropagation' enables them to function as artificial neural 'networks' [42]. Not all labelled data is required for this process. Thus, the chapter acknowledges the technical limitations for AI act lawmakers, including the halting problem, where AI can be trapped in an endless cycle of feedback loops without knowing when it is correct. As a result, AI is limited in its ability to make decisions, and human intervention is necessary. These limitations restrict the scope of AI applicability. However, Margrethe Vestager, [43] cautioned that the 'proposed legal framework does not look at AI technology itself. Instead, it looks at how AI is used and what for' [44].

Defining intelligence remains a matter of philosophical and computational debate. AI may not aim to replicate human intelligence, as it can perform tasks that complement, rather than replace, human abilities. Continuing Margrethe said: 'We find those — limited — uses of AI that we prohibit altogether because we simply consider them unacceptable. AI systems use subliminal techniques to cause physical or psychological harm to someone, for example, in the case of a toy that uses voice assistance to manipulate a child into doing something dangerous. Such uses have no place in Europe. We, therefore, propose to ban them' [45].

Taken the view of the chapter, the prohibition on the use of subliminal techniques can be considered subjective due to the significant variability in perceptual thresholds that can be influenced by a range of factors of not only 'age, and physical or mental disabilities' [46]

choices in a non-neutral manner, such as giving more prominence to certain choices through visual, auditory, or other components, when asking the recipient of the service for a decision. It should also include repeatedly requesting a recipient of the service to make a choice where such a choice has already been made, making the procedure of cancelling a service significantly more cumbersome than signing up for it, or making certain choices more difficult or time-consuming than others, making it unreasonably difficult to discontinue purchases or to sign out from a given online platform allowing consumers to conclude distance contracts with traders, and deceiving the recipients of the service by nudging them into decisions on transactions, or by default settings that are very difficult to change, and so unreasonably bias the decision making of the recipient of the service, in a way that distorts and impairs their autonomy, decision-making, and choice. However, rules preventing dark patterns should not be understood as preventing providers from interacting directly with service recipients and proposing new or additional services. Legitimate practices, for example, in advertising, that comply with Union law should not be regarded as constituting dark patterns. Those rules on dark patterns should be interpreted as covering prohibited practices falling within the scope of this Regulation to the extent that those practices are not already covered under Directive 2005/29/EC or Regulation (EU) 2016/679'.

41 Upchurch M. Robots and AI at Work: The Prospects for Singularity. *New technology, work, and employment*. 2018. No 33 (3). Pp. 210. DOI: 10.1111/ntwe.12124 (date accessed: 25.08.2023).

42 Ibid. Pp. 209.

43 Executive Vice-President for A Europe Fit for the Digital Age and Competition, European Commission (2019 — present).

44 Vestager M. Speech by Executive Vice-President Vestager at the press conference on fostering a European approach to Artificial Intelligence, 'Check against delivery,' 21 April 2021. URL: https://ec.europa.eu/commission/presscorner/detail/en/speech_21_1866 (date accessed: 25.08.2023).

45 Ibid.

46 AI Act. Article 5 (1, b). URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

but, for instance also an experience. As many researchers often say, all data are not equal [47]. Hence, an AI-powered toy could use subliminal tech to persuade children to engage in hazardous behaviours because 'the AI might never learn—or worse, could learn incorrectly' [48]. In this regard, the AI Act Article 5(1)(b) would apply to the example provided as it explicitly forbids exploiting the 'vulnerabilities of a specific group of persons due to their age' [49]. Hence, such an imbalance will not be reflected if the audience of the toy is out of the zone of vulnerabilities. Therefore, it will be a dilemma for manufacturers to put up for sale a toy in the ratio between points (a) and (b) of Article 5 challenging to establish universal thresholds for subliminal techniques, making it difficult to regulate effectively.

1.2. Beyond a person's consciousness

Consciousness is an elusive concept, and efforts toward understanding it or its evolution oscillate between philosophy and neuroscience—between thought experiments and measurable tests of brain activity [50]. The robust scientific understanding of how our qualitative experiences (e.g., the felt quality of emotion, the subjective experience of blue) arise from brain states shall be restorative. The chapter questions what is beyond a person's consciousness. And, how do you not go there? [51] For instance, the Stanford Virtual Human Interaction Lab [52] makes an overly exaggerated statement about the all-encompassing immersion and responsiveness of VR: 'An Interactive Virtual Environment (IVE) is a fully immersive and interactive computer-generated environment that gives the user the feeling of being somewhere other than where they are in the physical world. VR systems block out the perceptual input from the real world and replace it with perceptual input from a virtual environment that surrounds the user, is fully responsive to the user's actions, and elicits feelings of presence. Because of these affordances, VR allows users to vividly and viscerally experience any situation as if it were happening to them from any perspective' [53].

While individuals have control over the AI metaverse techniques they use, non-compliant systems may employ persuasive procedures encouraging individuals to go beyond consciousness. It can be challenging for individuals to resist this push. In such situations, individuals must weigh the potential risks and benefits of engaging with the system and make a decision that aligns with their own values and priorities

47 Lew G., Schumacher R. M. Jr. AI and UX Why Artificial Intelligence Needs User Experience. 1st edit. Berkeley, CA: Apress, 2020. 4. Garbage In, Garbage Out.

48 Ibid.

49 AI Act. Article 5 (1, b). URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

50 Balakrishnan V. Sh. The birth of consciousness: I think, therefore I am? *Lancet neurology*. 2018. No 17 (5). Pp. 402. DOI: 10.1016/S1474-4422(18)30076-0 (date accessed: 25.08.2023).

51 Tsou Y. J. Origins of the Qualitative Aspects of Consciousness: Evolutionary Answers to Chalmers' Hard Problem. In *Origins of Mind.* Ed. Liz. Swan. 1st ed. Dordrecht : Springer: Netherlands, 2013. Pp. 261. DOI: 10.1007/978-94-007-5419-5 (date accessed: 25.08.2023).

52 It is a research group under Jeremy Bailenson that has conducted empirical studies on the impact of VR. They have offered a well-considered analysis of the claims about VR's ability to enhance empathy.

53 Bailenson J. Op. cit. ; Herrera F., Bailenson J., Weisz E., Ogle E., Zaki J. Building long-term empathy: A large-scale comparison of traditional and virtual reality perspective-taking. *PLoS ONE*. 2018. No 13(10). Pp. e0204494. DOI: 10.1371/journal.pone.0204494 (date accessed: 25.08.2023).

whether to go 'over the boundary, something that has physical existence in this world but agency in the imagined world' [54].

The AI can indeed be seen as an extension of the human mind, which fits well with the characterisation of AI as a mimic of the human mind [55]. From a cognitive perspective, vulnerability is deviating from others on a psychometric trait to exploit this deviation [56]. The responsibility for providing answers does not lie solely with lawyers. However, the legal community must play a crucial role in enhancing the effectiveness of the AI Act. Notably, the AI metaverse systems are designed to enhance and expand human experiences. Individuals who refrain from tempting with them may miss certain opportunities for growth and learning. Hence, the decision to explore beyond one's consciousness is a personal one that should be made carefully considering and aware of 'a wholly new kind of experience that will challenge our sense of authenticity and change our relationship to our own minds' [57].

2. State of the psyche

Today's AI is no longer a virgin zone for data swaps through a quasi-real globe built by dispatch technology. Mental phenomena occur in the minds of all participants in legal relations and, consequently, in the whole nature of life and social behaviour.

The relationship between consciousness and the body has been a speculation topic since recorded human culture's inception. A mental state is used to conditionally distinguish a relatively static moment in the psyche of an individual, emphasizing the dynamic moments state of the psyche, which are reflected in human behaviour, indicating the stability or not of the psyche manifestations, its fixation and mirroring on personality attitude. Knowledge of mental states allows one to conduct law activities and assess the material distortion sufficiently. Prolonged experience of emotional complexes often turns internally contradictory mental states. Philosophers have systematically explored this subject in the Western world since the 17th century. René Descartes, for instance, questioned whether his perception of reality was an illusion and ultimately resolved the issue with his famous assertion, 'I think, therefore I am' [58].

2.1. Material distortion

By merging AI with other technologies, such as AR/VR, blockchain, and networking, the metaverse can create secure, scalable, and realistic virtual worlds on a reliable and always-on platform [59]. Hence, in an uncertain, contradictory situation, the metaverse participant may experience dual (ambivalent) mental states that violate his usual activities (behaviour), causing concern and increased anxiety. Respectively, material well-being faces an uncertain prospect of the development of events without a clear understanding of how to eliminate the danger that has arisen — whether it truly exists or not is purely subjective to lead to distortion. Accordingly, users'

54 Murray J. H. Virtual/reality: how to tell the difference. *Journal of visual culture*. 2020. No 19 (1). Pp. 18. DOI: 10.1177/1470412920906253 (date accessed: 25.08.2023).

55 Neuwirth R. J. Op. cit. Pp. 61.

56 Franklin M., Ashton H., Gorman R., Armstrong S. Op. cit. URL: https://journals.flvc.org/FLAIRS/article/view/130723/133924 (date accessed: 25.08.2023).

57 Murray J. H. Op. cit. Pp. 16. DOI: 10.1177/1470412920906253 (date accessed: 25.08.2023).

58 *See* Lindborg R. René Descartes. Stockholm: Natur och kultur, 1968.

59 Huynh-The Th., Pham Q.-V., Pham X.-Q., Nguyen Th. Th., Han Zh., Kim D.-S. Artificial intelligence for the metaverse: A survey. *Engineering applications of artificial intelligence*. 2023. No 117 (2023). Pp. 105581. DOI: 10.1016/j.engappai.2022.105581 (date accessed: 25.08.2023).

immersive experience in the metaverse is enhanced significantly, with nearly no boundary between the virtual world and the real world.[60] The situations envisioned from this meticulously crafted scenario fail to consider willing and cooperative participants who have the ability to end not going 'beyond a person's consciousness [61] at any moment by closing eyes because 'vision is crucial to human cognitive behaviour' [62]. However, for the metaverse to be successful, these participants must choose to stay engaged in the highly artificial setting to convey mental fabrication. To clarify, legal synaesthesia may provide a solid basis for legal theory and practice [63].

The chapter expands the AI Act's reach to metaverse environments that could be a credible source for material distortion of a person's behaviour. Among other things, in the view of the research, it requires specific attention when modern advances such as pupillometry [64] feedback is pushing the metaverse forward to AI systems [65]. The breakdown has ascertained, metaverse [66] is a combination of 'meta' and 'universe' and

60 Huynh-The Th., Pham Q.-V., Pham X.-Q., Nguyen Th. Th., Han Zh., Kim D.-S. Op. cit. DOI: 10.1016/j.engappai.2022.105581 (date accessed: 25.08.2023).

61 AI Act. Article 5, para 1 (a). URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

62 Lee K.-F., Chen Y.-L., Yu Ch.-W., Jen Ch.-L., Chin K.-Y., Hung Ch.-W., Wen Ch.-B. Eye-Wearable Head-Mounted Tracking and Gaze Estimation Interactive Machine System for Human–machine Interface. *Journal of low frequency noise, vibration, and active control*. 2021. No 40 (1). Pp. 19. DOI: 10.1177/1461348419875047 (date accessed: 25.08.2023).

63 Neuwirth R. J. Op. cit. Pp. 104.

64 *See* Gutjahr M. O. et al. The Pupil Response as an Indicator of User Experience in a Digital Exercise Game. *Psychophysiology*. 2019. No 56 (10). Pp. e13418–n/a. DOI: 10.1111/psyp.13418 (date accessed: 25.08.2023) ; Patel A. N., Chau G., Chang C., Sun A., Huang J., Jung T.-P., Gilja V. Affective response to volitional input perturbations in obstacle avoidance and target tracking games. *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. Pp. 6679–6682. DOI: 10.1109/EMBC46164.2021.9630523 (date accessed: 25.08.2023) ; Kim A. J., Murch W. S., Limbrick-Oldfield E. H., Ferrari M. A., MacDonald K. I., Fooken J., Cherkasova M. V., Spering M., Clark L. Do pupillary responses during authentic slot machine use reflect arousal or screen luminance fluctuations? A proof-of-concept study. *PloS One*. 2022. No 17 (7). Pp. e0272070—e0272070. DOI: 10.1371/journal.pone.0272070 (date accessed: 25.08.2023) ; Prochazkova E., Prochazkova L., Giffin M. R., Scholte H. S., De Dreu C. K. W., Kret M. E. Pupil mimicry promotes trust through the theory-of-mind network. *Proceedings of the National Academy of Sciences.* 2018. No 115 (31). Pp. E7265—E7274. DOI: 10.1073/pnas.1803916115 (date accessed: 25.08.2023) ; Artificial Intelligence in Education. 17th International Conference (Madrid, Spain, June 22—26, 2015). C. Conati, N. Heffernan, A. Mitrovic, M. F. Verdejo, Eds. 1st ed. 2015. DOI: 10.1007/978-3-319-19773-9 (date accessed: 25.08.2023).

65 AI Act. Article 3 (1): '*artificial intelligence system (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with'.* URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

66 While numerous definitions have been proposed, only a handful of them effectively clarifies how the various technical terms relate to the overarching concept of the metaverse. Through an exploratory approach, Cathy Hackl (2021) surveyed professionals, resulting in 20 distinct definitions of the metaverse. Hackl questions whether literature truly captures the way that many individuals in the technology and business sectors use the term 'metaverse.' The chapter utilizes grounded theory to address metaverse operation to AI systems as defined by the AI act. Hackl's (2021) survey of professionals yielded several defining characteristics of the metaverse, including persistence,

was first introduced in Neal Stephenson's dystopian cyberpunk novel 'Snow Crash' in 1992 [67], describing it as a shared virtual space with avatars. The novel refers to a virtual reality world called the 'matrix'. Employing grounded theory [68], the chapter illustrates the metaverse as a VR, where the defining characteristics include persistent physics and real-time interaction, and which together with one or more criteria of (a) machine learning with a wide variety of methods, including deep learning [69], (b) logic- and knowledge-based approaches 'to create new knowledge from existing information [70] and (c) statistical approaches, Bayesian estimation, search, and optimization methods [71] — 'can be modified or customized in various ways according to the application field and methods' [72] exist dependently to the physical world through 'an eye tracker' [73].

live digital interaction, agency, social presence, shared spatial awareness, and voice interaction. Other characteristics mentioned include supporting non-fungible and infinite items and personas, real-time rendering, and a massive virtual economy. However, the virtual world concept already encompasses some of these characteristics, such as the ability to share virtual experiences and cloud computing technologies. The idea of creating memories that rival physical experiences and a social network based on gaming are also present in existing virtual worlds. Eventually, the metaverse may be seen as a subset of virtual worlds characterized by a sense of mass delusion; *See* more at https://www.cathyhackl.com/ (date accessed: 25.08.2023).

67 Stephenson N. Snow Crash. New York: Bantam Books, 2008.

68 *See* Oktay J. S. Grounded Theory. Oxford: Oxford University Press, 2012 ; Morse J. M. Developing Grounded Theory the Second Generation Revisited. Ed. J. M. Morse. 2nd edit. Abingdon, Oxon, United Kingdom : Routledge, 2021.

69 Regardless, according to Arpaci and Bahari (2023), Pp. 9 — autonomy, a desire to be self-directed, is considered one of the fundamental psychological needs necessary for well-being and optimal growth. Metaverse provides its users with self-direction in actions, feelings, and thoughts. Metaverse may help learners feel autonomous; when they feel autonomous, they perceive their behaviours, motivations, and preferences to be aligned. In this virtual world, learners can feel more self-governed and act in their interests. Notably, hedonic motivations (need for entertainment) were the most vital determinant of educational sustainability. These findings have managerial and practical implications, which administer bridge the void between hypothesis and pattern. For example, service providers should focus on these critical factors to enhance their customer base and service quality.

70 Noah Ph. A systematic approach to the Qualitative Meta-synthesIs. *Issues in Information Systems*. 2022. No 18 (2). Pp. 197. DOI: 10.48009/2_iis_2017_196-205 (date accessed: 25.08.2023).

71 AI Act. Annex i artificial intelligence techniques, and approaches referred to in Article 3, point 1.

72 Cho Y., Hong S., Kim M., Kim J. DAVE: Deep Learning-Based Asymmetric Virtual Environment for Immersive Experiential Metaverse Content. *Electronics (Basel)*. 2022. Nr 11 (16). Pp. 9. DOI: 10.3390/electronics11162604 (date accessed: 25.08.2023).

73 The research explained (Ko-Feng et al. (2023), pp. 19—21) that an eye tracker, also known as an eye movement tracking instrument, is an instrument that is used to record eye movements and convert them into gaze trajectories. The correction procedure of the eye model, which simplifies the calibration process of the overall system, minimizes the correction time and improves ease of use, was integrated into the sampling period established by the mapping model. The detection algorithms for eye trackers are classified into model-based methods and feature-based methods. Model-based methods usually consider entire images in the context of preset shapes and model formulas. The pupil ellipse that is subsequently captured can fit a possible fixation angle from the model. It is computationally intensive and does not rely on reflected spots for tracking. The feature-based approach uses the typical characteristics of the human eye to identify the eye. These include the corneal edge, pupil, or light reflection on the cornea. The primary purpose of each feature is to obtain information concerning the eyes and face.

2.2. The assessment of psychological harm

Defining the concept of 'psychological harm' in the context of AI is also problematic since it is challenging to identify or even conceive a specific AI system that utilizes subliminal techniques for metaverse twinning. On the other hand, if metaverse AI-based systems are noncompliant with Article 5 para 1 (a) (b) of the AI Act systems but somehow [74] remain on the hand of the user and are urging an individual to go beyond their own consciousness, is it how AI act shall regard AI systems when the individual resists this push on the grounds that it 'is likely to cause' [75] psychological harm?

The requirements concerning data, documentation and traceability, provision of information and transparency, human oversight, and robustness and accuracy are mandatory for high-risk AI systems [76]. Companies that introduced codes of conduct for other AI systems would do so voluntarily [77]. Voluntarily stopping eating and drinking is increasingly recognized as a means for seriously ill patients to hasten their deaths intentionally [78]. By analogy, it is improbable that voluntary moves will succeed in the AI industry, as no one desires fatal consequences for their products. Hence, individuals are more likely to consent voluntarily; instead, the AI market is unlikely to accelerate fatal outcomes for the business as noncompliance with regulations due to voluntarily revealing is a manner that causes or is likely to cause harm instead of being directed toward an individual in means 'that person or another person' it is directed toward AI market. In this regard, a user reporting system about what happened is welcome. However, it is a draconian approach because it requires people within communities to snitch on one another [79].

Furthermore, the AI act prohibiting subliminal techniques raises awareness of potential trauma [80] affecting a person's 'psychological state, making him depressed

74 *See* Anon (2021) If you build it. 441 (9272): 71–72.

75 Interestingly, liability issues and moral claims do not require actual harm to materialize. It is enough to set the proof about the chain of causation in proportion to the probable consequences and its damaging blow under the affinity ratio to 'that person or another person'. At the same bit, as a rule, the amount of compensation for moral damage is determined in court based on the victim's claims, as stated in the lawsuit. In this regard, the lack of precise criteria for assessing the 'harm' for moral compensation when the general method of quantifying its amount is not sufficient to apply to an article in question, and therefore creates difficulties in law enforcement practice and requires further research and guidelines. For example, the severity or harshness of the consequences will be paramount as soon as the AI act comes into force, forecasting difficulties in court practice. Compensation may be refused or substantially reduced if there is no direct link.

76 AI Act. 3.3. Impact assessment. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

77 Ibid.

78 Quill T. E, Ganzini L., Truog, Robert D., Pope T. M. Voluntarily Stopping Eating and Drinking Among Patients With Serious Advanced Illness—Clinical, Ethical, and Legal Aspects. *JAMA internal medicine*. 2018. Nr 178 (1). Pp. 126. DOI: 10.1001/jamainternmed.2017.6307 (date accessed: 25.08.2023).

79 Machon A. The Privacy Mission: Achieving Ethical Data for Our Lives Online. Hoboken, NJ : John Wiley & Sons, Inc., 2022. Chapter 1: Our human rights online.

80 According to Scottez (2023), a traumatic occurrence entangles actual exposure to death, the threat of death, serious injury, or violence. These events are usually sudden and unexpected and can overwhelm a person's coping ability. The psychological reactions to trauma are categorized based on the timing of the traumatic event. The immediate or peri-traumatic

and suicidal' [81] that 'could cause him or her serious and irreversible psychological consequences, or even lead him or her to commit suicide, which is a matter for the referring court to determine in the light of all of the relevant information, in particular the medical information' [82]. Second life [83] attempted to build the metaverse but lacked the necessary remedies for injuries to mental health that 'can only be considered to be harmful to health if they are part of a pathological condition and go beyond the health problems to which persons concerned' [84] so 'harm entailed pathological damage' [85].

Consequently, the rapid application of AI in all spheres of society's life has highlighted some problems, including the designation of AI and its types of equipment, and software products for their certainties as subjects and objects of legal relations that lead to emotional disorder of a person giving a birth a criminality element [86]. Emotional states can shape an individual's mood and color their mental processes, impacting their attitudes towards people, events, and ongoing phenomena for an extended period. Certain mental states can become dominant in an individual's personality structure, influencing their choice of harm response to various situations, whether by criminal or non-criminal behaviour.

After mortal demeanour flares to the grid globe, the legal powers of the natural world correspondingly ought to penetrate the web freedom, particularly in the generation of AI. The negative mark of the evolution of AI technology is AI-based cybercrime, which divulges the joint discharge between technology and regulation. AI-based commitments retain higher technology range than widespread cybercrime. Nevertheless, it is unthinkable

reaction occurs within minutes or hours after the trauma, while acute stress occurs between two days and one month after the event. Post-traumatic stress disorder involves symptoms that persist for more than a month. The clinical picture of psycho-trauma is classically described as a triad that includes symptoms of repetition, avoidance manifestations, and neuro vegetative hyperactivity. However, the consequences of trauma can also manifest in other ways, such as adaptation disorders that involve difficulty mobilizing one's psychic energy, reactive attachment disorders that involve negative mental representations, complicated grief, psychosomatic manifestations, mood disorders, anxiety disorders, and behavioural disorders.

81 CJEU, Case C- 69/21, X v the Staatssecretaris van Justitie en Veiligheid, ECLI: EU:C:2022:913, para. 21. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62021CJ0069 (date accessed: 25.08.2023).

82 Ibid. Para 71.

83 *See* Boellstorff T. Coming of Age in Second Life: an Anthropologist Explores the Virtually Human. Princeton : Princeton University Press, 2008.

84 CJEU, Case C-577/21, LM, NO v HUK-COBURG-Allgemeine Versicherung AG, ECLI: EU:C:2022:992, para. 46. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62021CJ0577 (date accessed: 25.08.2023).

85 Ibid. Para. 51.

86 The study showed that people in contact with AI are more likely to commit crimes. *See* Dabbaghian V., et al. Theories and Simulations of Complex Social Systems. Ed. by V. Dabbaghian and V. Kumar. Mago, 1st ed. 2014. Springer Berlin Heidelberg. DOI: 10.1007/978-3-642-39149-1 (date accessed: 25.08.2023) ; Progress in artificial intelligence: 21st EPIA conference on artificial intelligence. (Lisbon, Portugal, August 31-September 2, 2022). G. Marreiros (ed.). Cham, Switzerland: Springer, 2022 ; Digital Forensics and Cyber Crime: 11th EAI International Conference (Boston, MA, USA, October 15—16, 2020). Ed. S. Goel. 1st ed. Cham, Switzerland : Springer, 2021. DOI: 10.1007/978-3-030-68734-2 (date accessed: 25.08.2023).

to discourse AI-based hardships through criminal legislation instantly. It ought to be a ratio between ruling and justice in the countenance of AI match and objective riff to enforce the EU commitment to defending AI limitations because AI supports criminalities [87]. It is because AI can profoundly impact individuals' well-being, sometimes leading to emotional breakdowns. One type of breakdown is affect [88], characterized by a disorganization of consciousness and a sudden activation of impulsive, involuntary defensive, and aggressive reactions. The diagnostic signs of affect include sudden onset, explosive nature, and intense emotional discharge. These experiences can manifest impulsive and stereotyped actions. Individuals may also exhibit specific changes in consciousness, such as narrowing their focus on emotionally charged experiences. This can lead to inadequate decisions and be detrimental to interests and plans, with regrets coming later.

AI-based affect can also result cognitive processing issues, such as fragmented perception and partial amnesia. Outwardly, individuals may display autonomic nervous system disorders. Emotional and volitional regulation of behaviour may also decrease, resulting in reduced self-control. Individuals may experience post-affective exhaustion, leading to a loss of strength, decreased activity, and feelings of stupor, apathy, and lethargy. Moreover, abnormal affect is a phenomenon that can develop in individuals with psychopathic tendencies, where deviations from the norm are not severe enough to qualify as a pathology yet still display certain emotional and motivational defects. Understanding the AI-based affect is crucial not only in the investigation of crimes but also when assessing the psyche state.

Influentially, that even if individuals with psychopathic tendencies display abnormal affect, it does not necessarily excuse them from criminal responsibility. The legal significance of abnormal affect is in evaluating the perpetrator's mental state, and it can help in understanding the underlying motives and causes of their actions. Significantly, these symptoms can impact an individual's life. They should be taken seriously before placing on the market, entering service, or using an AI system.

87 Through AI experiences, a user feels frustration, a typical emotional reaction that may include aggression or depression. Aggression may take the form of substitution actions directed towards entirely unrelated objects. At the same time, depression may lead to groundless self-accusations and potentially escalate into auto-aggression, including suicide attempts, self-inflicted pain, and mutilation. Aggressive behaviour may be triggered by the association of adjacency to the original stimulus or directed at a completely random object. Such behaviour is often marked by an inadequate and incomprehensible response accompanied by effectively charged emotions, impulsive actions, and cruelty. Frustration itself can be considered a contributing factor to aggressive behaviour in such situations. Research has shown that poorly educated, emotionally unrestrained, and psychopathic individuals are more likely to exhibit aggressive behaviour associated with frustration. At the same time, those with a neurotic disposition, insecurity, and anxiety are more prone to depressive reactions. The destructive effects of frustration may be exacerbated if an AI user consumes alcohol. It is essential to note that frustration cannot be used as an excuse to release perpetrators from responsibility for their crimes. However, understanding the psychological factors presenting frustration can help comprehend the underlying causes and motives of violent crimes that may appear unmotivated or the work of individuals with seriously disturbed psyches. In some cases, primarily when frustration arises from the victim's wrongful actions, it may be considered a mitigating factor in sentencing, as the law allows.

88 *See* Communication and Affect : a Comparative Approach / ed. T. Alloway, L. Krames, P. Pliner. New York : Academic Press, 1972.

Therefore, the relationship between the AI and the harm caused 'should be considered when the behaviour is not explained by another disorder, when it is being used for excessive periods, when the preoccupation seems irresistible, and when its use is causing clinically significant distress or impairment in social, occupational, or other important areas of functioning' [89].

In the view of the chapter, a court to determine the psychological harm under the Article 5 para 1 (a) (b) in question shall invite an expert with special knowledge and appoint a forensic psychological expertise together with case materials. However, the basis for expert research is a contract concluded based on a written application (letter) of the customer (a legal entity or an individual), with a mandatory indication of his details, with a list of issues to be resolved, as well as objects to be provided. A psychological examination aims to establish an individual's mental activity and behaviours, which have legal significance and can lead to legal consequences. The examination shall primarily focus on identifying the following aspects of the individual's mental state [90]: (1) unique psychological features, character traits, and prominent personality qualities; (2) motivational factors that influence the individual's mental life and behaviour; (3) emotional reactions and states exhibited by the individual; (4) regularities during mental processes, their level of development, and individual properties. Accordingly, with ethical motives, it is difficult to push a person who has received psychological harm from the measured use of AI systems to agree to be a researched object. In recap, the chapter ascribes whether crime is committed outside of AI systems placenta or illicit manners drove by AI simulation in a manner that causes or is likely to cause harm in question. Therefore, emergency needs studies that query AI decision-making as a credible enough ground whether weigh it for the verdict 'guilty.'

3. Biometrics and psyche

The notion of biometric data used in AI act [91] is in line with and should be interpreted consistently with the notion of biometric data as defined in Article 4 (14) of Regulation (EU) 2016/679 of the European Parliament and of the Council (GDPR) [92], Article 3 (18) of Regulation (EU) 2018/1725 of the European Parliament and the Council [93] and Article 3 (13) of Directive (EU)

89 Goltz N., Dowdeswell T. The imaginationless generation: lessons from ancient culture on regulating new media. Leiden: Brill Sense, 2019. Pp. 16.

90 Psychologists employ established scientific methods and techniques that have undergone certification to achieve these objectives. They may also use modified versions of these methods, chosen based on the examination's specific research questions and context.

91 AI Act. Recital 7. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

92 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation). OJ L 119, 4.5.2016. Pp. 1—88. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679 (date accessed: 25.08.2023).

93 Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices, and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC, PE/31/2018/REV/1. OJ L 295. 21.11.2018. Pp. 39–98. URL: https://edps.europa.eu/data-protection/our-work/subjects/regulation-20181725_en (date accessed: 25.08.2023).

2016/680 of the European Parliament and the Council [94].

The AI act defines biometrics in Article 3 from (33) to (38) points. It has three separate and distinct definitions for biometric data for AI systems agenda (1) recognition system for identifying or inferring emotions or intentions of natural persons, (2) categorisation system for assigning natural persons to specific categories, (3) identification of remote, real-time, and post remote systems for identifying natural persons through the comparison of data relating to the physical, physiological, or behavioural characteristics. Like GDPR in its Article 4 (14), the AI act refers only to the examples provided to facial images or dactyloscopy data with no exceptions. Nevertheless, it does say that the processing should be based on the key functional characteristics of the software, in particular, the ability of a given set of human-defined objectives to generate outputs such as content, predictions, recommendations, or decisions that exploit the environment with which the system interacts, be it in a physical or digital dimension [95].

In contrast, Illinois state law of the US [96] extents mean to biometric identifiers and biometric information where first is 'a retina or iris scan, fingerprint, voiceprint, or scan of hand or face geometry' [97]. Biometrics does not include information derived from items or procedures under the definition of biometric identifiers. with exclusions of writing samples, written signatures, photographs, human biological samples for valid scientific testing or screening, demographic data, tattoo descriptions, or physical descriptions such as height, weight, hair color, or eye color. And, the second is 'any information, regardless of how it is captured, converted, stored, or shared, based on an individual's biometric identifier used to identify an individual' [98]. Although the law protects biometric identifiers and information, processing functions may require more clarification on its application. One example is the uncertainty about whether the law covers facial recognition software that identifies faces from photographs. Moreover, while facial geometry scans are considered biometric identifiers, images are excluded from the list, and information derived from excluded items cannot be considered biometric information. The AI Act, on the other hand, offers greater clarity as it defines biometric data, which is 'resulting from' specific technical processing' and 'such as' facial images or dactyloscopy data in Article 3 para 1 (33) accordingly. The language used in the article is broad and can adapt to AI. These broader formulations are better suited to keeping pace with advancements in AI technology, as it does not limit the types of biometric data that may be subject to protection.

Distinctive, the Washington statute concentrates on collecting biometric data for commercial purposes, defining 'biometric

94 Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection, or prosecution of criminal offenses or the execution of criminal penalties, and the free movement of such data, and repealing Council Framework Decision 2008/977/JHA. OJ L 119. 4.5.2016. Pp. 89—131. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32016L0680 (date accessed: 25.08.2023).

95 AI Act. Recital 6. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

96 Illinois Biometric Information Privacy Act, 740 ILCS § 14/1. URL: https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3004 (date accessed: 25.08.2023).

97 Devany B. E. Clearview ai's first amendment: dangerous reality? *Texas Law Review*. 2022. No 101 (2). Pp. 498.

98 Ibid.

data generated by automatic measurements of an individual's biological characteristics such as a fingerprint, voiceprint, eye retinas, irises, or other unique biological patterns or characteristics that are used to identify a specific individual' [99]. The definition is combined with the biological outcome, which cannot be said about the AI act with its technical result obtained from physical, physiological, or behavioural characteristics processing. Nevertheless, a factor specific to someone's physical or physiological identity would include facial features, fingerprints, iris, DNA, general appearance, height, gait, and dress style [100]. That leaves unclear the outer boundary of linkability [101]. Hence, a context-free understanding of personal data is not sustainable [102]. Regardless, the AI act shall not simply repeat GDPR but instead focus on AI systems peculiarities. Although non-immersive technology may not effectively capture certain types of data, immersive AI and data-capturing environments can collect and record data in much greater detail.

Besides, there is a legislative loophole in Annex 1 of the AI act as it does not cover immersive data for generating creations such as content, prophecies, hints, or decisions that can influence the backdrops individuals interact with. Like the GDPR, which aims to determine a person's identity, it also fails to regulate the use of psyche-based immersive data for determining likes, interests, or motivations. This presents a significant opportunity for the AI market to use biometric data in new and innovative ways, as immersive AI provides a more comprehensive and in-depth approach to capturing data that can be used to create unique human-based insights and discoveries, combining biometrics and psychographics, which evaluate the persons' activities, interests, and opinions through their cognitive attributes, such as values, attitudes, and emotions. To illustrate the distinction, traditional biometrics are like static images of fingerprint swirl linking individuals to their unique identity. At the same time, psychographics is more akin to consumer silhouettes that map an individual's intentions or shifts in opinion over time [103]. This disparity is crucial because the information included in biometric psychography has significant surface and

99 Revised Code Washington, Chapter 19.255, Section 19.255.005. URL: https://apps.leg.wa.gov/RCW/default.aspx?cite=19.255.005 (date accessed: 25.08.2023) ; *See also* URL: https://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2023&sessInd=0&billBody=H&billTyp=B&billNbr=0708&pn=0654 (date accessed: 25.08.2023).

100 Hutton Ch. Linkability, Personhood and State Modernity: Understanding the Affordances of Personal Identity Across Different Legal Regimes. *Law and literature*. 2019. No 31 (2). Pp. 241—242. DOI: 10.1080/1535685X.2018.1530840 (date accessed: 25.08.2023).

101 Ibid. Pp. 242.

102 Ibid.

103 For example, Kind ((2021), p. 4) asks the reidentification question of what makes a person the same person over time. Psychological theorists, also known as psychological continuity theorists, go beyond focusing on an individual's memory to understand their psychology more comprehensively. They argue that what makes person A the same as person B is that person B has memories of person A's experiences and shares a continuity of intentions, desires, beliefs, character traits, and more. While these psychological features are not identical, there must be enough continuity between them for A and B to be considered the same person. This means there should be a significant overlap between the psychological features of A and the next temporal stage, A1, and then between A1 and the next stage, A2, and so on, up to B. Even if there is no significant overlap between A and B, there should still be a significant overlap with the immediately preceding temporal stage. The idea is that psychological continuity is critical to understanding personal identity and encompasses more than just memories. On the other hand, 'explanatory methods of cognitive science and neuroscience are insufficient to address (b)' (Tsou (2013), p. 264.).

implications. In comparison, according to Recital 7 of the AI act, laws regulate traditional identity-focused biometrics. However, none leads precisely to the protection of biometric psychography, mainly because more legal studies are needed.

Biometric data encompasses the user's identity, which is often already known to AI systems through, for example, financial and account data and their unique reactions to specific stimuli. This type of data, known as biometric psychographics, includes biological measures such as eye tracking, facial scans, galvanic skin response, electroencephalography (EEG), electromyography (EMG), and electrocardiography (ECG) [104]. These measures provide a deeper understanding of the user's emotions, cognitive load, and truthfulness. For example, facial tracking can predict when a user experiences emotions, while EEG can reveal their state of mind and level of cognitive load. Galvanic skin response can indicate the intensity of a user's emotions, such as anxiety or stress. At the same time, EMG detects involuntary micro-expressions that can foreshadow whether a person is divulging the actuality. Nevertheless, ECG can similarly indicate truthfulness by measuring pulse or blood pressure changes in response to a stimulus.

Biometric psychography is a cutting-edge concept [105] that involves bodily-centered data to uncover intimate details about users' preferences, interests, and emotions. While this data is relevant beyond immersive technology, such technology must capture it. Biometric psychography technology presents more tremendous potential than its predecessors but also introduces unforeseen risks. Immersive technological systems may create new privacy violations with their novel ability to track and predict user behaviour and a lack of regulation. It is not just a hardware issue. The rules governing content, data collection, data use, user behaviour, and identity in immersive environments shape privacy and safety concerns. Also, AI systems could produce adverse outcomes to the health and safety of persons, particularly when such systems operate as components of products [106]. As immersive AI becomes more prevalent, biometric psychography becomes unavoidable. Unlike traditional biometrics focusing on identity, biometric psychography utilizes biometric data to understand a person's attractions. That consciousness is accompanied by experience because of the kinds of sensory organs and nervous systems that humans have evolved to possess [107].

It is also crucial to recognize that the range of biometric psychography is flexible. For conscious psyche states that fall in this class, adaptationist explanations can ascribe the origins of the qualitative aspects of these states [108]. Besides adaptationist explanations, other evolutionary explanations that can explain why a trait (e.g., qualia) exists include (1) a trait emerged due to random factors (e.g., genetic

104 Heller B. Watching Androids Dream of Electric Sheep: Immersive Technology, Biometric Psychography, and the Law. *Vanderbilt Journal of Entertainment and Technology Law*. 2020. No 23 (1). Pp. 28—29. URL: https://scholarship.law.vanderbilt.edu/jetlaw/vol23/iss1/1 (date accessed: 25.08.2023).

105 Although this chapter relates to the ideas of biometric psychography, the author needed to research the originator of this concept. *See also* Psychography. *Scientific American.* 1885. *19* (494supp). Pp. 7888–7889. DOI: 10.1038/scientificamerican06201885-7888supp (date accessed: 25.08.2023).

106 AI Act. Recital 28. URL: https://artificialintelligenceact.eu/the-act/ (date accessed: 25.08.2023).

107 Hutton Ch. Op. cit. Pp. 264. DOI: 10.1080/1535685X.2018.1530840 (date accessed: 25.08.2023).

108 Tsou Y. J. Op. cit. Pp. 265. DOI: 10.1007/978-94-007-5419-5 (date accessed: 25.08.2023).

drift, demographic events), (2) a trait exists because of developmental effects (e.g., pleiotropy, allometry), (3) a trait was once adaptive but is no longer so, (4) a trait is itself not adaptive but a by-product of an adaptive trait (i.e., 'spandrels'), and (5) a trait is an evolutionary by-product but subsequently acquired adaptive value (i.e., 'exaptations') [109]. The discovered approach employed measures a person's reactions 'by conscious expression of emotions and thoughts [110] to stimuli over time, which 'hovers on the verge' [111] revealing physical, mental, and emotional states and the stimuli that triggered them.

The AI act does not reflect the development of immersive technology when considering what features are available with hardware, how those features function, what knowledge about users is available, and how that data could be exploited. The risks and harms of psyche-based immersive technology are difficult to assess, but a hybrid framework can help mitigate identified risks. The chapter probes how it operated through biometrics, enabling AI to perform and how the resulting data can be used to generate insights into users. Therefore, it is critical to amend the AI act and establish psyche-based experience criteria. On the other hand, as AI evolves, new applications such as video gait analysis may emerge from assessing emotional states; however, capturing data that enables biometric psychography is a prerequisite for AI to function, and this field is likely to expand as technology advances; consequently, the AI act will need constant additions or changes.

Conclusions

The increase in AI evidence submitted on the 'voluntary' facets due to the absence of high risks is problematic due to the need for more experts to determine the accuracy of the evidence. Low-quality AI examination can lead to inaccurate results, potentially resulting in the concrete placement on the market, putting into service, or using AI systems. Given that unlawfully obtained evidence is not necessarily inadmissible, assessing the weight such violations hold on the overall fairness of the trial may be particularly difficult for judges [112]. Therefore, the chapter emphasizes the importance of data accuracy for the AI Act and recommends looking at Article 5 (4) (d) Convention 108+ [113]. Hence, the higher the reliability of the data input, the better the prohibited/allowed boundaries outcomes.

The subliminal techniques in AI systems are subjective, and defining the harm caused for the psyche is difficult. However, the AI market is moving towards greater transparency, safety, and ethical means through the AI Act. In the view of the chapter, crimes committed might be based on psychological harm from continuous interaction with AI systems, and legislation needs to be in place to clarify whether 'affect' has a criminalization character of

109 Tsou Y. J. Op. cit. Pp. 266. DOI: 10.1007/978-94-007-5419-5 (date accessed: 25.08.2023).

110 Balakrishnan V. Sh. Op. cit. DOI: 10.1016/S1474-4422(18)30076-0 (date accessed: 25.08.2023).

111 Rickard J. Rebuilding Babel: Science, Fiction, and a New Divinity. *Bucknell review*. 2002. No 46 (1). Pp. 100.

112 Quezada-Tavárez K., Vogiatzoglou P., Royer S. Legal challenges in bringing AI evidence to the criminal courtroom. *New Journal of European Criminal Law*. 2021. Vol. 12. Is. 4. Pp. 538. DOI: 10.1177/20322844211057019 (date accessed: 25.08.2023).

113 Council of Europe (2018) Modernised Convention for the Protection of Individuals with Regard to the Processing of Personal Data, Amending protocol to the Convention for the Protection of Individuals with Regard to the Processing of Personal Data. URL: https://www.coe.int/en/web/data-protection/convention108/modernised (date accessed: 25.08.2023).

such actions in terms of Article 5 para 1 (a) (b).

Another crucial area that requires revision is the legal definition of biometric data. Defining biometric data accurately is essential for effective regulation, as ambiguity may create problematic loopholes. By accomplishing this, existing biometrics laws can be expanded to address unexplored data types such as biometric psychography. Additionally, the current AI act does not cover locomotion-related physiological characteristics, such as gait tracking, despite their potential to identify individuals. Therefore, it is necessary to determine precisely what constitutes biometric data. As for now, the AI act repeats GDPR. It is still being determined whether it is a distinct notion subject to restrictions or prohibitions and remains Article 5 para 1 (a) (b) in question.

Lawyers with expertise in automation, information systems, electronics, engineering, communication, and computing are needed to enforce the AI Act. However, crossing the line between prohibited/allowed and determining whether AI evidence complies with applicable laws can be challenging, especially when assessing data protection and privacy rule violations. Following the analogy, with the breaking of the sound barrier, to break the time barrier would be to go faster than time [114]. Therefore, AI systems must be subject to human oversight and undergo rigorous testing to ensure their safety and reliability rather than relying on an article in question force.

Заборонена практика штучного інтелекту
Дар'я Булгакова

Авторка намагається забезпечити всебічне розуміння регулювання штучного інтелекту (далі — ШІ) шляхом дослідження новітнього закону Європейського Союзу, відомого як Акт про штучний інтелект. Наголошено на регуляторних проблемах, пов'язаних із забороною систем ШІ, спрямованих на використання підсвідомих методів. Із метою покращення користувацького досвіду звернено увагу на перспективу метавсесвіту. Також із метою уникнення практикування моделей, які працюють шляхом відстеження характеристик ока, дослідження наголошує на проблемі врегулювання біометричної психографії, пов'язаній із тим, що досліджуваний закон про ШІ не готовий до врегулювання проблем зі ШІ, спрямованих на оброблення біометричних даних, адже лише повторює Загальне регулювання персональних даних, тим самим не вживаючи додаткових регуляторних заходів для усунення ризиків оброблення персональних даних технологіями ШІ. Запропоновано чотири ключові аспекти для врегулювання проблематики. По-перше, спрямування правового курсу на заборону систем ШІ, наприклад, для врегулювання ринку пупілометрії. По-друге, розробники закону мають звернути увагу на концепції про підсвідомі засоби систем ШІ, здатні обробляти дані за межами свідомості людини. По-третє, скомпільовано критерії психологічної шкоди шляхом оцінювання судової практики. По-четверте, запропоновано усунути взаємопов'язаний ризик конфіденційності, особливо коли система ШІ спочатку виглядає дружньою, а насправді вмикає механізм відстеження. Тому дослідження пропонує розширити концепцію й удосконалити захист біометричних даних для систем ШІ.

***Ключові слова**: свідомість; підсвідомі методи; матеріальне спотворення; психологічна шкода; біометрична психографія.*

114 Stiegler B. Techniques and Time (la technique et la temps) (Translated by Beardsworth, Richard and Collins George (1998)). 1998. Vol. 1. California: Stanford University Press. Pp. 15.

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Це дослідження не отримало жодного спеціального гранту від фінансових установ у державному, комерційному або некомерційному секторах.

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