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The state of the human psyche in accordance with Article 5 (1(a)) of the human regulation of the European Union on Artificial Intelligence

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The legal course of the European Union has been established to ban AI systems that use subliminal techniques. The concept of "subliminal methods", "beyond the limits of human consciousness" and "material distortion" in the context of damage to the psyche is explained through the assessment of the behavior of a person who has suffered or may potentially suffer psychological damage. The need to expand the scope of banning the use of AI systems is emphasized.

Keywords: prohibition of AI systems, consciousness, subliminal techniques, psychological harm assessment, biometric data processing, biometric psychography.

Стан психіки людини відповідно до статті 5 (1 (a)) регулювання Європейського Союзу про штучний інтелект

Дар'я Булгакова

Установлено правовий курс Європейського Союзу на заборону систем AI, які використовують методи впливу на підсвідоме. Пояснено поняття «підсвідомі методи», «поза межами свідомості людини» та «матеріальне спотворення» в контексті шкоди психіці через оцінку поведінки особи, якій завдана або потенційно може буде завдана психологічна шкода. Підкреслено необхідність розширення сфери заборони застосування систем AI.

Ключові слова: заборона систем штучного інтелекту; свідомість; методи впливу на підсвідомість; визначення психологічної шкоди; обробка біометричних даних; біометрична психографія.

The legislative course of the Artificial Intelligence (AI) Act [4] of the European Union 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' [1]. Margrethe Vestager, Executive Vice-President for A Europe Fit for the Digital Age and Competition in the European Commission, cautioned that the 'proposed legal framework does not look at AI technology itself. Instead, it looks at how AI is used and what for' [14]. Although the AI Act defines the legislative concept for an AI system, it fails to clarify what is prohibited for use and how the psychological harm shall be assessed as caused or is likely to be caused.

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. The 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 is open to interpretation in the research paper. The study proposes to comply with the article in question by designation of stressed criteria. In addition, the article in question employs the wording 'or' rather than 'and' giving a ground psychological harm to be considered apiece from physical harm and vice versa, which also means that one disservice is enough for the interrelated AI systems to be banned. The results are beneficial for the single market workflow (i) allowing compliant systems to be placed on the market, put into service, or used, while (ii) contradictory systems shall be banned, and where (iii) AI systems are questionable, they should be subject to review and additional inspections. The placement on the market, putting into service, or using such systems should be suspended until compliance is achieved.

In the view of the research, the article in question is a prohibition rule for AI systems forcing to be met under the condition of (potential) harm, which is challenging to identify on the grounds that cause or is likely to cause harm in the AI market context. Significantly, liability issues and non-material claims do not require actual harm to materialise. 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' (affected individual). At the same bit, as a rule, the amount of compensation for moral damage is determined in court based on the victim's claims 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 — it, therefore, creates difficulties in case law practice and requires further guidelines. Since the claim may be refused or substantially reduced if there is no direct link between AI systems beyond a person's consequences and the state of the psyche of the affected individual. In this respect, the research strives to examine the behavioural prerequisite for an individual's psyche determination regarding AI Act Article 5 para 1 point (a).

The ability to control our actions and act according to our intentions is crucial to the human experience. It is claimed that subliminal stimuli can influence behaviour. Such influences are not perceptually subliminal, yet still subliminal in their influence. Regardless, we are unaware of our higher cognitive functions' effect on emotional cues [13]. 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 [12, p. 20].

It is difficult to name a concrete AI system that deploys subliminal techniques [12, p. 25]. However, the EU has already taken measures to protect a person's mind from subliminal manipulation through existing legislation. For instance, the Audiovisual Media Services Directive (EU) 2018/1808 of the European Parliament and of the Council Article 9 (b) prohibits subliminal techniques in commercial audio-visual communications. The Regulation (EU) 2022/2065 of the European Parliament and of the Council, known as the Digital Services Act in Recital 67, discourses the use of dark patterns by regulating practices (in a prohibited way) that may impair the ability of recipients to make informed and autonomous decisions. Therefore, by analogy, the research recognises subliminal techniques that materially distort or impair, either on purpose or, in effect, the ability of an affected individual to make autonomous and informed choices or decisions. Those practices can persuade the affected individuals to engage in unwanted behaviours or undesired decisions having negative consequences for them.

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 [3]. 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. Hence, the research questions what is beyond a person's consciousness. And, how do you not go there? The Stanford Virtual Human Interaction Lab assembled an overly exaggerated statement about the all-encompassing immersion and responsiveness, taking the example of virtual reality (VR). According to findings, an Interactive Virtual Environment is a fully immersive and interactive computer-generated environment that gives the user feeling of being somewhere other than where they are in the physical world [2, 6]. 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 [2, 6]. Because of these affordances, VR

allows users to experience any situation vividly and viscerally as if it were happening to them from any perspective [2, 6].

Moreover, the operation of AI algorithms relies on feedback loops and may never 'know' when it is 'right' [16, p. 210]. Alternatively, backpropagation enables them to function as artificial neural networks [16, p. 209]. Thus, the research acknowledges the technical limitations of 'beyond' AI systems, 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 what is beyond.

By merging AI with other technologies, such as VR, blockchain, and networking, AI systems makers can create secure, scalable, and realistic virtual worlds on a reliable and always-on platform [8, p. 3]. In an uncertain, contradictory situation, the participant (affected individual) may experience dual (ambivalent) mental states that violate his usual activities (behaviour), causing concern and increased anxiety. Respectively, the material well-being of affected individuals 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 and could lead to distortion.

Accordingly, the immersive experience of an affected individual is enhanced significantly, with nearly no boundary between the virtual world and the real world [8, p. 4]. 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 danger and make a decision aligning with their values and priorities regarding whether to go over the boundary. While individuals have control over the AI systems they use, affected individuals shall demarcate ‘something that has physical existence in this world but agency in the imagined world' [11, p. 18]. Otherwise, individuals' behaviour may display nervous psyche disorders. Emotional and volitional 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. Therefore, material distortion is an AI-based effect resulting in an individual's cognitive processing issues, such as fragmented perception and partial amnesia. Material distortion is also an abnormal AI-based affect — a phenomenon applicable to 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.

According to the Explanatory Memorandum of AI Act, the impact assessment requirements concerning data, documentation and traceability, provision of information and transparency, human oversight, robustness, and accuracy are mandatory for high-risk AI systems. Companies that introduced codes of conduct for other AI systems would do so voluntarily, including following the principle-based requirements that AI systems should comply with. On the other hand, voluntarily stopping eating and drinking is increasingly recognized as a means for seriously ill patients to hasten their deaths intentionally [15, p. 126]. Thus, 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. Regardless, in the view of the research, it is improbable that voluntary moves will succeed in the AI industry, as no one desires to suspend consequences for their products. Remarkably, a reporting measure of an affected individual about what happened is always welcome. However, it is a draconian approach because it requires people within communities to snitch on one another [10].

The crucial area that requires revision is the extent of biometric data protection. Defining biometric data accurately is essential for effectively regulating AI systems, as ambiguity may create loopholes. By accomplishing this, biometrics laws can be expanded to address unexplored data types such as biometric psychography.

Based on the AI Act Recital 7, the notion of biometric data used in the AI Act 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 (known as GDPR), Article 3(18) of Regulation (EU) 2018/1725 of the European Parliament and the Council, and Article 3(13) of Directive (EU) 2016/680 of the European Parliament and the Council. Furthermore, the AI Act defines biometrics in Article 3 from (33) to (38) points. It has three separate and distinct characterisations 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 data comparison relating to the physical, physiological, or behavioural characteristics. Also, like GDPR Article 4 (14), the AI Act refers only to facial images and dactyloscopy data examples. Nevertheless, AI Act Recital 6 does say that the processing should be based on the key functional characteristics of the software ability of a given set of human-defined objectives to generate outputs such as content, predictions, recommendations, and decisions that exploit the interaction environment between physical and digital dimensions.

Sensory perception and the interfaces that enable it are further aspects of immersive technology that allow users to create alternative realities [5, p. 23]. Two features are essential for creating effective immersive hardware: components that allow measuring and producing stimuli [5, p. 23]. Pupillometry studies how the pupil dilates and contracts in response to stimuli [5, p. 30]. The measurements track a physical change in the body's state over time [5, p. 30]. In short, pupil dilation can act as an 'involuntary-like button' [5, p. 30]. Due to that, the research proposes categorising an individual's psyche under the biometric psychography concept involving bodily-centered data to uncover intimate details about affected person preferences, interests, and emotions and dimension them. While this concept is relevant beyond immersive technology, AI-based biometric psychography systems could capture mentioned data via pupillometry and, given a lack of regulation, introduce unforeseen risks, such as privacy violations, with the ability to track and predict user behaviour. Unlike traditional biometrics focusing on identity, biometric psychography utilizes biometric data to understand a person's attractions. AI analysis of consciousness is accompanied by experience because of the kinds of sensory organs and nervous systems that humans have evolved to possess [7, p. 264].

The field of pupillometry is of great interest due to its ability to categorise biometric data, as defined in the AI Act Article 3 (35). The research highlights that vision is crucial to human cognitive behaviour [9, p. 19]; hence, eye tracking is increasingly relevant for the legal suspicious, especially with a foveated enhancement of AI experiences. Nevertheless, as these practices are widespread, individuals may become more hesitant to share their innermost thoughts and emotions. Even if a person attempts to self-censor, the subconscious nature of AI factors may make such efforts futile. Accordingly, suspicious AI systems shall be banned from placement in the European Union market.

Lawyers with specialized knowledge in automation, information communication technology systems, electronics, engineering, and computing are required to enforce the AI Act effectively. However, determining whether AI systems comply and fall within the allowed or prohibited limits of Article 5 para 1 point (a) requires further guidance. The use of subliminal techniques by AI systems that may cause harm to an individual's mental health is a subjective matter and must be evaluated on a case-by-case basis. Additionally, the research recommends determining the scope of biometric data that AI systems can use. The AI Act repeats GDPR, and it is still being determined whether it is a separate concept that should be subject to limitations or prohibitions under Article 5, paragraph 1(a). The research authors suggest improving the article mentioned above, clarifying the prohibition of AI systems that can affect an individual's state of the psyche. For instance, the use of pupillometry tracking processes resulting in or likely to result in behavioural distortions under the classification of biometric psychography should be prohibited in principle. Consequently, weighing the ethical implications of pupillometry and indexing its processing designated to biometric data protection would assure a course on prohibition.

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Demonstrating the reliability of Craniofacial Superimposition

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In this work, we present the results of two Validation studies carried out to assess the reliability of our proposed Artificial Intelligence-guided methodology combined with the MEPROCS framework for the application of Craniofacial Superimposition.

Keywords: craniofacial identification; craniofacial superimposition; Artificial Intelligence.

Демонстрація надійності черепно-лицевого накладання

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Робота представляє результати двох перевірочних досліджень, проведених для оцінки надійності запропонованої нами методології, керованої штучним інтелектом, у поєднанні з інфраструктурою MEPROCS для застосування черепно-лицевого накладання.

Ключові слова: черепно-лицева ідентифікація; черепно-лицеве накладення; штучний інтелект.