

The cyberpsychology of biometric information ecosystems. Sustainability or digital totalitarianism?

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Abstract. In the contemporary era, technological advances have rapidly led to a reality where the risk of the emergence of the phenomenon of digital totalitarianism, such as that given by China's coercive biometric surveillance systems, can also emerge in the member states of the European Convention on Human Rights (ECHR). The digital information ecosystem has become a central element of the human psyche as a result of the development of the Internet of Things (IoT)¹, exerting a profound influence on human perception and the state of consciousness. This article aims to analyze the interaction of the biometric information ecosystem sphere with social credit while integrating nuanced psychological aspects into this emerging paradigm through the impact such a system can have. Through this approach, the psycho-social implications of coercive digital systems engaged in experiencing reality and the evolution of contemporary society are both brought into discussion.

Keywords: *digital totalitarianism, biometric surveillance, human psyche, IoT, social credit*

1. Introduction

An information ecosystem is a complex infrastructural framework in which interactions between data, information technologies, users, and regulations take place to facilitate the collection, storage, processing, and transfer of information. This framework includes technological components, such as hardware and software infrastructure, as well as social and cultural aspects that influence how information is used and interpreted by users. In essence, the information ecosystem provides the framework for the effective management and interaction of information within a digital community or organization and, like a natural ecosystem, an information ecosystem involves complex interactions between different entities and components, including people, organizations, devices and information systems. In contrast, IoT (Internet of Things) is a network of physical devices, vehicles, homes and other objects embedded with sensors, software and other technologies that allow these objects to connect and exchange data with each other.

Such an interconnectivity offers extensive opportunities for automating processes and improving efficiency in increasingly diversified fields (industrial, medical, pharmaceutical, legal etc.). In this process of automation, at the central level, there is the human factor with a compelling role which is

¹ Irene Connolly, Marion Palmer, Hannah Barton, Gráinne Kirwan, *An Introduction to Cyberpsychology*, London: Routledge, 2016.

progressively decreasing the daily automation process minimizing the human determinism factor with the consequence of role reversal culminating in the emergence of the technological-digital impact that eventually drives the psycho-social existence of the individual. However, without strongly insisting on the technical approach, it is worth mentioning that this automation is made possible by the emergence of artificial intelligence as a product of algorithmic learning based on the principle of machine learning, representing a branch of artificial intelligence that focuses on the development of systems and algorithms capable of learning and progressively improving themselves through the management of meta-data.

2. Biometric surveillance systems and the social credit

An *a priori* necessity for this investigation was to qualify the reference definitions of the areas concerned in order to provide understanding in what follows to the fundamental thesis of this paper.

Thus, biometrics is the science that uses statistical and probability methods to measure and analyze the biological characteristics of living organisms, interpreting the results in context. Psychometrics, on the other hand, is a branch of psychology that deals with the quantification, classification, and measurement of mental phenomena and intellectual abilities using standardized and calibrated tests and experimental methods. At the same time, biometrics involves the use of human body measurements and biometric authentication in order to facilitate identification and access control. Biometric identifiers include human physiological (e.g. fingerprint, facial recognition) and behavioral characteristics. These identifiers are essential for acknowledging and describing individuals in various contexts. However, one of the world's greatest powers is coming up with a new paradigm in terms of how to implement biometrics² in social life that may entail adverse consequences including for the global view of big data and the ownership of this data, and through the possible emergence of a digital dystopia, where humans are encumbered by an algorithmic standardized digital determinism that changes their moral and empathic structure as well as their social life.

The social credit system, originally designed to be applied to the financial-banking sector, comparable to other bank credit assessment systems in the West, was used as a mechanism for recording claims (debts) owed by debtors to banks that had not been paid. However, over time, it has evolved and been extended to address other dimensions, such as the moral and legal integrity of individuals and companies. This transition was influenced by social and economic changes in China, including the disintegration of the post-Mao socialist moral order and the need to rebuild trust in society.

In terms of the history of China's Social Credit System, it has been a complex method of strategy and instruments with a focus on the financial-banking sector to manage financial and market irregularities, which originated in the 1990s with the establishment of the first credit registry bank by the People's Bank of China. In 1999, the idea was expanded with the publication of the National Credit Management System report by the Chinese Academy of Sciences. Both state and non-state actors have played important roles in the design and implementation of China's social credit system. They linked the need to address China's financial misbehavior and "trust"³ crisis to the disintegration of the post-Mao socialist moral order. However, what started as a financial regulatory tool has now expanded to broader moral-legal dimensions. It has moved from a financial approach to the implementation of pilot programs by the authorities and private companies, and in 2014, China's State Council launched the Outline Plan for Building a Social Credit System (2014-2020), which was the result of ten years of research, consultation, and collaboration.

² Chuncheng Liu, Multiple Social Credit Systems in China, *Economic Sociology*, 2019.

³ Alexandra Stevenson, Paul Mozur, China Scores Businesses and Low Grades Could Be a Trade-War Weapon, *The New York Times*, 22 September 2019.

As of November 2021, China has implemented significant measures to regulate biometric data⁴, with legislation and regulations formulated in such a way as to grant public security organs enhanced powers to collect and use biometric data, especially in the context of law enforcement and national security tasks. This security-oriented approach has led to the creation of the largest police-managed DNA database in the world, as well as to the emergence of innovative surveillance systems for human behavioral identification and classification that China now has. Even to the emergence of a reward-punishment system through the mechanism of social credit, undermining the act of justice as a human factor in exchange for a ubiquitous artificial intelligence-based digital system that assigns punishments and rewards.

Therefore, it can be outlined that, in the name of maintaining stability, the biometric information of millions of people, including voice data, facial data, fingerprints, gait, iris, DNA, and the social relationship status have been collected without their individual consent. This massive data collection has coincided with the development of a biometric informational ecosystem that may rapidly lead to the existence of a digital totalitarianism over entire communities when a new utopian utilitarianism is imposed.

3. Digital psychism – consciousness and active brain inference in the perceptual instance

In such a context marked by great changes, where the perception of reality tends to be augmented, the discussion shifts to the framework of the experience of the human psyche and the state of consciousness, recalling that the state of consciousness is defined as a distinct cortical state, characterized by its particular and individual sensitivity to internal or external stimuli, marking a person's awareness of self and environment. It is an aspect of brain functioning, a nervous phenomenon specific to organisms with a well-developed central nervous system, becoming increasingly complex as it evolves phylogenetically, peaking in humans with the emergence of language - a key phenomenon that contributed to its development. And this involves perception of events in the environment, memory, gnostic integration, attention, volitional activity, and affectivity. The level of consciousness depends on brain excitability and imposes the initial wakefulness state of the nervous system⁵. Thus, the state of consciousness represents the integrative function of the entire nervous system, which, in the waking state, integrates the messages coming from the external or internal environment of the body through sensory-sensory afferents.

The state of consciousness⁶ can be classified into three main types: (1) The elementary state of consciousness, which supports wakefulness, alertness, and perception of time and space. This type of consciousness has a neurophysiological substrate present in both humans and animals; (2) The operational-logical state of consciousness, in which intellectual, perceptual, and thought processes are coherent and objectively reflect reality; (3) The axiological state of consciousness, which involves individual choices for certain values, influenced by social criteria, the last two being of relevance to this paper.

The framework of existence impacted by the digital phenomenon, reinforced by the dynamics of information ecosystems with biometric surveillance coercion affects and interferes with the dynamics of operational-logical consciousness as well as axiological consciousness in individuals. Therefore, individuals involved in this phenomenon of accelerated change, shifting from the objective reality to a digital one, will be able to exercise their adaptability and integration of a new psychic life, only by managing to make this experience as non-menacing as possible. Although, when a reality becomes increasingly augmented, it will eventually become more difficult for future generations to believe that the perceptual and information processing framework will not change. Further introducing one of the

⁴ Rachel Cheung, The Grand Experiment: Two decades on, China's social credit system is more dysfunctional than dystopian, *The Wire China*, Retrieved on 19 December 2023.

⁵ Bruno Edmond, Robert L. West, *Cyberpsychology: A Human-Interaction Perspective Based on Cognitive Modeling*, 2003.

⁶ K. Friston, Learning and inference in the brain, *Neural Networks*, 2003.

most interesting findings in neuroscience, namely the concept of active inference⁷. This comes to explain how the brain perceives conscious reality, but also how based on predictive vectors, the brain can "hallucinate" reality, a concept to which two renowned neurobiologists, Karl Friston and Anil K. Seth contributed. Their added value involved the understanding of how the human brain and other cognitive systems process information and make decisions in their environment. Active inference indicates that action and perception are inseparable processes and that our brain actively generates actions to validate and continuously improve its predictions about the environment.

According to this theory, the human brain constantly creates a predictability that operates with an anticipatory purpose, constantly generating hypotheses and predictions about what should happen in its environment, thus concretizing the state of awareness and constantly updating it to the demands of the environment. These predictions are then compared with the sensory data the brain receives from the environment. When reality matches the predictions, the brain confirms their validity⁸, and this contributes to a stable and coherent perception of the environment. However, when there are discrepancies between predictions and sensory data, the brain attempts to minimize these discrepancies through action, adjusting its predictions and behavior to better match reality as a complementary hallucinatory reflex.

The active inference brought about in the context in which the brain is subjected to digital stimuli, based on the principle in which the perceptual framework unfolds, provides us with the understanding that the conscious reality experienced by subjects interacting with digital systems is capable of constantly creating specific predictions⁹, i.e. cognitive-digital predictions, which subsequently give subjects a new framework of experiential awareness open to the digital world. The subject will integrate and be integrated into the experience itself, respecting the specific environmental conditions. Such a matter can be observed to some extent in China's proposed large-scale experiment on the implementation of social credit and punitive and reward measures that are attributed to computer systems specializing in biometric surveillance of Chinese citizens. These systems condition¹⁰ the environmental experience of individuals subject to surveillance by intruding on their socio-legal status according to a predetermined score and assigning a score at the individual level according to the superficial interpretation of the human factor given by the existence of mathematical algorithms. In such a situation, Pavlovian conditioning is also not excluded, because inherent in the principle of reward-punishment to different stimuli, the human psychic life will be shaped according to the imposed social standard.

4. Conclusions

The individual's psychological experience is therefore shaped to a large extent by the influences of the external-digital environment, which interacts with his emotions and feelings through systems outside his authentic nature that are artificial and have strictly this purpose. These influences restructure the individual and his existence, influencing his motivations and desires. In such a digital landscape, personality will evolve differently because of the artificial intervention of a persistent surveillance system, which acts as an arbiter and modulator of social reality.

It remains to be seen whether the implementation of a Pavlovian conditioning system of the collective axiological consciousness of individuals, i.e. the ongoing experiment of the implementation of social credit in China, will lead to the development of a utopian society, characterized by

⁷ Gifford Clive, Anil Seth, *Brain Twisters: the science of feeling and thinking*, 2015.

⁸ S. Franklin, Baars B.J., Ramamurthy U., Matthew Ventura, *The role of consciousness in memory, Brains, Minds, and Media*, 2005.

⁹ Filip Šebok, *Social Control and Propaganda*, in Kristina Kironka, Richard Q. Turscanyi, *Contemporary China: a New Superpower?*, 2023.

¹⁰ Frank J. Ayd, Jr., *Lexicon of Psychiatry, Neurology, and the Neurosciences*, Lippincott, Williams & Wilkins, 2001.

sustainability and security while involving the sacrifice of individual freedom for the common good, or will generate a dystopian society in which the rise of totalitarianism will eradicate all forms of individual freedom.

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