Mind, Machines and Property: Rethinking Ownership of Thought and Mental Labour

Aatmajaa Shankar Prasada[1]

Abstract: The advent of neurotechnology and artificial intelligence has shifted our perspective of property, ownership of thoughts, and neural data. This raises critical legal and philosophical questions regarding the ownership of thoughts, neural data, and cognitive outputs. Traditional intellectual property regimes safeguard creative expressions however, they do not recognize the direct recording of the mental activity through brain-computer interfaces (BCIs) and neurotechnology. Since there is a gap between mental labour and creative expression is becoming increasingly ambiguous, this paper tends to examine whether neural data can be classified as a form of property under prevailing legal theories, taking points from ideas of John Locke, Hegel, Karl Marx, and Michel Foucault to understand how ownership of thoughts and brain signals might fit into the existing legal theories.it further engages with Mark Rose historical study of authorship and Walter Benjamin's insights on mechanical reproduction,to analyze whether AI-generated and neurogenerated content are to be protected under IP protections. Beyond the scope of intellectual property law, this paper examines the intersection of Mill's concept of liberty[1], Arendt's framework on labour, and Zuboff's surveillance capitalism[2] thesis , to emphasise the ethical implications of neural data ownership, specifically relating to mental privacy and cognitive autonomy. exploring case studies such as Chile's Neurorights Law (2021)[3] ,the paper provides further development in legislative developments and analyses how governments are responding to the risks of cognitive commodification. Finally, it proposes a legal framework for neural intellectual property that intersects technological invention with ethical imperatives, highlighting the importance of legal framework against the corporate monopolisation of human cognition. As there is a rapid increase in digital economy and its intersection with human thought, it is important to ensure that brain data and personal thoughts remain private and protected.

I. INTRODUCTION

Advanced technologies such as BCIs,EEGs and neural decoding machines now have the skills to interpret brain activity which raises a question of how does consent become when mind becomes data? These technological advancements hold transformative applications in the field of Healthcare and BCIs, although they have huge potential for benefits for people with disabilities and could be transformative in healthcare, communication, and entertainment, at the same time, they create daunting legal and moral challenges. Of these, the most fundamental is owning and consenting to brain data. Can brain-derived outputs be categorised as intellectual property? To whom do they belong: the user, device manufacturer or the data processer? And more basically, is it possible to consent to the extraction and commodification of one's cognitive activity?

These queries acquire a sense of urgency in those times when consent has become a standard checkbox buried within terms of service agreements. Current legal regimes—particularly within intellectual property (IP) and data protection law—treat brain data either as biometric information or fail to recognise it at all. Yet brain data is uniquely sensitive. Unlike other forms of personal data, such as fingerprints or browsing histories, neural data is involuntary, intimate, and predictive. It can reveal emotional states, attention levels, preferences, and even unconscious associations before an individual becomes aware of them. Such data cannot be easily compartmentalised or anonymised. This challenges traditional notions of authorship, privacy, and proprietary rights that underpin the IP system.

This paper investigates the following research question: What does meaningful consent look like in the context of neurodata extraction, and how can legal theory evolve to

---

[1] John Stuart Mill, On Liberty 6 (John W. Parker & Son 1859), https://archive.org/details/onliberty00inmill/page/n6/mode/1up (last visited Mar. 30, 2025)

[2] Shoshana Zuboff, The Age of Surveillance Capitalism [Page] (PublicAffairs 2019), https://archive.org/details/zuboff-shoshana.-the-age-of-surveillance-capitalism.-2019 (last visited Mar. 30, 2025).

[3] Neurorights Law, Ley No. 21.383, Nov. 25, 2021, Diario Oficial [D.O.] (Chile).

protect cognitive autonomy? The aim is not merely to assess gaps in the law but to critically interrogate the philosophical basis of ownership and control over the mind's outputs. In doing so, the paper engages with the writings of two key theorists—John Locke and Shoshana Zuboff—whose ideas, though emerging from different intellectual traditions, converge on the centrality of consent.

This paper proceeds as follows: The nature of the brain data and the legal ambiguity over its use form part of the discussion in Section II. Section III works with Locke and Zuboff's theories to discover the philosophical aspects of ownership and consent. Part IV looks at new developments in legal responses, including Chile's Neurorights Law. Section V suggests a normative model of consent for closer accordance with the cognitive stakes at play. The conclusion is about saving mental sovereignty in the age of digital neuro-capitalism.

➤ *Progressive Development of Neurotechnological Implants: A Visual Overview:*
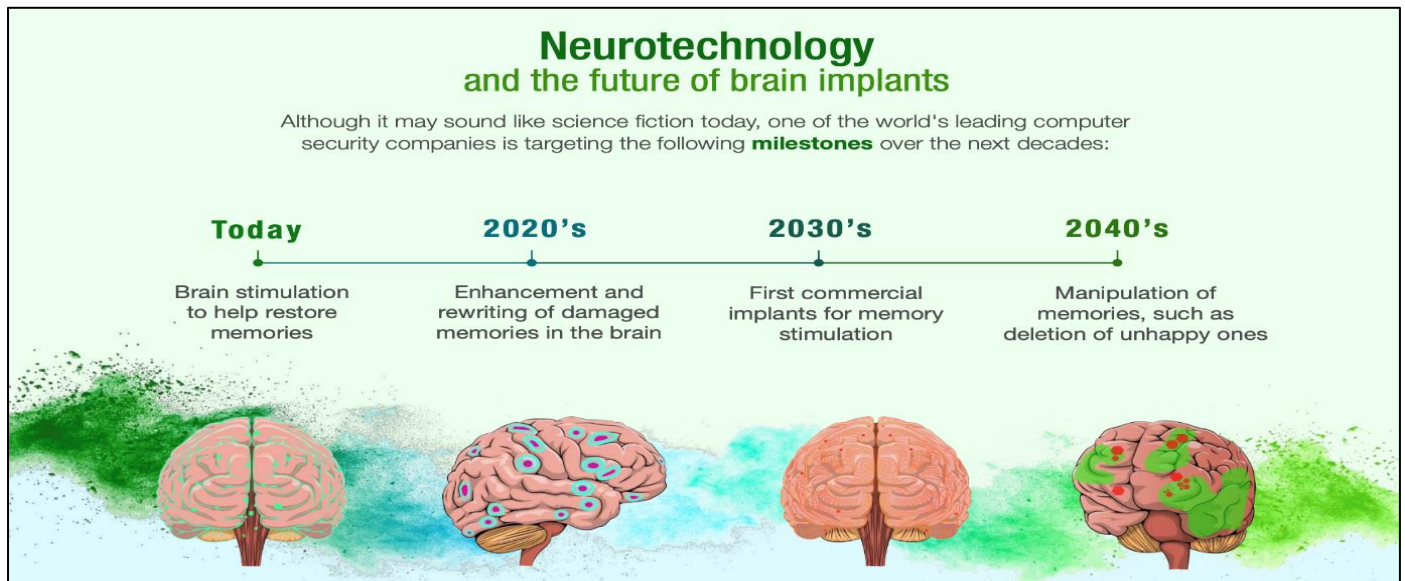

Fig 1 Progressive Development of Neurotechnological Implants: A Visual Overview

➤ *What is Brain Data and why Consent Matters?*

Neural data, or brain data, or cognitive signals, is the electricity, patterns emitted by the human brain. These signals may be recorded and decoded using such technologies as brain-computer interfaces (BCI), electroencephalography (EEG) devices and invasive neuroprosthetics to convert them into commands, speech or a visual output. This technology has been a breakthrough in clinical which has helped people with neurological impairments communicate—those with ALS or spinal cord injury. However, the increasing availability of non-clinical, consumer-grade neurotechnology, such as attention-monitoring headsets and emotion-detection tools, has brought these tools into mainstream digital ecosystems, including gaming, marketing, and productivity tracking.

➤ *Workflow Illustrating the Conversion of EEG Signals into AI-Generated Outputs:*
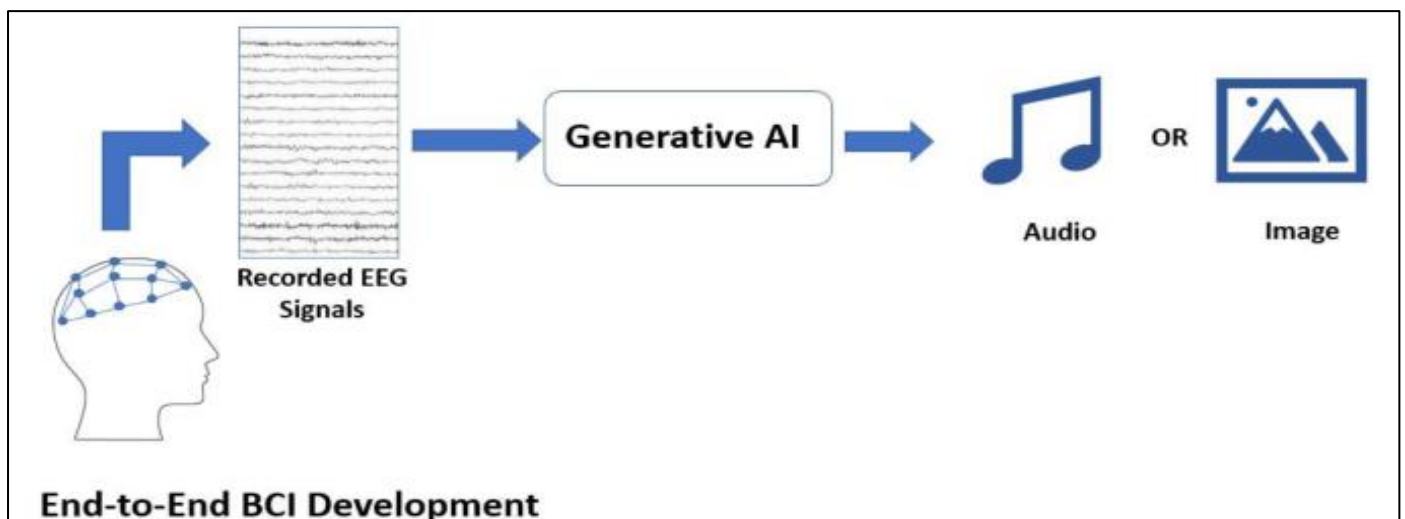

Fig 2 Workflow Illustrating the Conversion of EEG Signals into AI-Generated Outputs

This convergence raises complex questions about what brain data is. Is it biometric data, personal information, a form of intellectual labour, or a mixture of all three? Traditional legal categories are inadequate for classifying neural data because of its dual nature: it is both physiological and cognitive. It originates involuntarily from the biological body, yet also reflects intention, emotion, memory, and decision-making—facets deeply tied to individual identity and mental privacy.[4]

The intimacy of brain data makes it legally and ethically distinct from other forms of personal data. While biometric information like fingerprints and iris scans are static identifier, brain data is dynamic and predictive. Studies have shown that EEG signals can be used to infer a person's emotional state, attention span, and even subconscious preferences[5].

More significantly, emerging technologies are capable of detecting pre-conscious brain activity, raising the possibility of access to thoughts before they are voluntarily formed or expressed. This blurs the line between expression and cognition, a foundational distinction in intellectual property law, which traditionally protects only expressed ideas, not the ideas themselves[6].

The sensitivity of neural data renders consent particularly significant. However, current data protection frameworks rarely offer robust protection. In jurisdictions like the European Union, the General Data Protection Regulation (GDPR) protects biometric and health data, but it does not categorically address brain data unless it is processed in a way that reveals identifiable health conditions[7]In India, the Digital Personal Data Protection Act, 2023, similarly lacks express provisions on cognitive data, despite acknowledging sensitive personal data in general terms.[8] In the absence of precise regulatory frameworks, companies may collect, store, and analyse neural data under general consent clauses embedded in user agreements.This practice is deeply problematic. Most users do not understand the scope of the data they are providing, let alone its downstream applications in behavioural targeting, neuromarketing, or predictive analytics. Unlike text or image data, brain data may be collected passively and continuously, especially with wearable EEG devices that function in the background. When users are unable to foresee or control how their thoughts are recorded, consent becomes illusory. It fails the legal

standards of being informed, voluntary, specific, and revocable—principles necessary for ethical data collection.

Moreover, the implications are even more severe for vulnerable populations, particularly individuals with disabilities who use neuroprosthetics or BCIs as assistive technologies. In such cases, refusing consent may not be feasible, as the device itself becomes essential for basic communication or mobility. This dependency erodes the voluntariness of consent and exposes users to chronic surveillance and data commodification under the guise of therapeutic support[9].

In light of these concerns, it becomes evident that brain data cannot be regulated under the same assumptions guiding other data forms. It demands a new conceptual and legal framework that treats cognitive information not only as personal data but also as an extension of the self.

II. THEORETICAL FRAMEWORK: LOCKE AND ZUBOFF ON CONSENT

To understand how consent applies to the extraction and ownership of brain data, it is helpful to revisit two influential thinkers: John Locke, who provides a normative framework for the legitimacy of ownership and political authority, and Shoshana Zuboff, who critiques how modern data capitalism erodes the very foundations of meaningful consent.

> *John Locke: Labour, Ownership, and the Moral Basis of Consent*

John Locke's theory of property, as outlined in Two Treatises of Government, begins with the claim that "every man has a property in his person.[10] For Locke, ownership originates from an individual's labour—by mixing one's labour with resources from the commons, one creates property. While Locke's formulation was situated in an agrarian context, his theory has since been extended to intellectual property, where the mind's labour (ideas, inventions, expressions) generates ownable products.[11] Locke's theory offers two important insights for neural data. First, if brain-generated outputs—such as thought-to-text communications or neuro-controlled design result from mental labour, then the individual should be regarded as the rightful owner of that content. This is especially the case if people use brain-computer interfaces (BCIs), as a means to

---

[4] John Locke, Two Treatises of Government, edn Peter Laslett (Cambridge University Press 1988) Book II, ss 27–30.

[2] Shoshana Zuboff, The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power (PublicAffairs 2019) 93–119.

[3] Rafael Yuste and others, 'Four Ethical Priorities for Neurotechnologies and AI' (2017) 551 Nature 159.

[4] Nita Farahany, The Battle for Your Brain: Defending the Right to Think Freely in the Age of Neurotechnology (St. Martin's Press 2023) ch 2.

[5] Mark A. Lemley, 'The Myth of the Sole Inventor' (2012) 110 Michigan L Rev 709, 740.

[6] Regulation (EU) 2016/679 of the European Parliament and of the Council (General Data Protection Regulation) art 4(1), art 9.

[7] Digital Personal Data Protection Act 2023 (India), s 2(n).

[8] Marcello Ienca and Roberto Andorno, 'Towards New Human Rights in the Age of Neuroscience and Neurotechnology' (2017) 13 Life Sciences, Society and Policy 1.

[9] John Locke, Two Treatises of Government, edn Peter Laslett (Cambridge University Press 1988) Book II, s 27.

[10] Justin Hughes, 'The Philosophy of Intellectual Property' (1988) 77 Geo LJ 287, 296–297.

be creative or communicate, such as, say, to generate speech or art through neural activity.

Secondly Locke's theory insists that consent is fundamental to the acceptance of a system of power or ownership. In the context of political governance, Locke argues that individuals join civil society by giving voluntary consent to be governed.[12]By analogy, if companies or institutions are to exercise control over users' brain data, they must first obtain free, informed, and meaningful consent. Without it, any claim to ownership or use of brain data becomes illegitimate, violating the individual's natural right to self-ownership.

However, Locke's theory presumes a baseline of equality—that individuals are capable of giving genuine consent in a fair, transparent environment. This assumption does not hold in contemporary neurodata markets. Consent is often obtained through standard form contracts or digital interfaces that users must accept to access essential services. These practices undermine the Lockean requirement that consent be voluntary and reasoned, thus calling into question the legitimacy of current neurodata practices.[13]

Moreover, Locke does not account for systemic asymmetries in knowledge, power, or access to information. As we shall see, these concerns are central to Zuboff's critique of surveillance capitalism.

➢ *Shoshana Zuboff: Surveillance Capitalism and the Erosion of Consent*

In The Age of Surveillance Capitalism, Shoshana Zuboff offers a comprehensive analysis of how tech companies have turned human experience into a source of profit through unconsented data extraction. She argues that modern digital platforms collect data not just to improve services but to create predictive models of user behaviour. This process involves turning surplus behavioural data into "prediction products" that can be sold to advertisers and other third parties.[14]

Zuboff introduces the term "behavioural surplus" to describe the excess data collected from users beyond what is needed to provide a given service. This is typically done without explicit knowledge or consent. Users may agree to

terms of service, but these agreements are often lengthy, obscure, and not truly negotiable. As Zuboff explains, "Consent is no longer meaningful in a context where choice is an illusion."[15]

Applied to neurotechnology, Zuboff's analysis is even more alarming. Brain data is deeply personal and cannot easily be controlled or withheld. Devices such as wearable EEG headsets or implanted BCIs can collect data passively and continuously, with users often unaware of what information is being transmitted, stored, or sold. This creates structural conditions under which genuine consent is impossible what Zuboff calls the "dispossession of behaviour."[16]

Her theory helps reveal that current legal models, which focus on individual responsibility to understand consent forms, are ill-equipped to handle neurodata extraction. Instead of framing the problem as one of individual ignorance or passivity, Zuboff shifts the lens to institutional design—highlighting how systems are built to obscure, rather than clarify, the terms of engagement. The result is a digital environment where consent is manufactured, not given, and where users have little to no control over the commodification of their neural selves.

This critique also has implications for IP law. In regimes where data is framed as a tradable commodity, the ability to contract away rights to neural data becomes normalized—even when users do not fully understand the nature or implications of those rights. Zuboff's work reminds us that market consent cannot be equated with moral or legal legitimacy, particularly when it involves the mind itself.

➢ *Legal Developments and Gaps: Evaluating Current Frameworks*

While the theoretical principles of ownership and consent are well-established in liberal political and legal thought, the positive legal frameworks that govern brain data are still nascent and fragmented. Across intellectual property regimes, data protection laws, and emerging digital rights legislation, there remains no clear legal consensus on how brain data should be classified, who owns it, or what constitutes valid consent for its collection and use.

[11] John Locke (n 1) Book II, s 95.

[12]Margaret Radin, Boilerplate: The Fine Print, Vanishing Rights, and the Rule of Law (Princeton University Press 2012) 21–25.

[13] Shoshana Zuboff, The Age of Surveillance Capitalism (PublicAffairs 2019) 93–119.
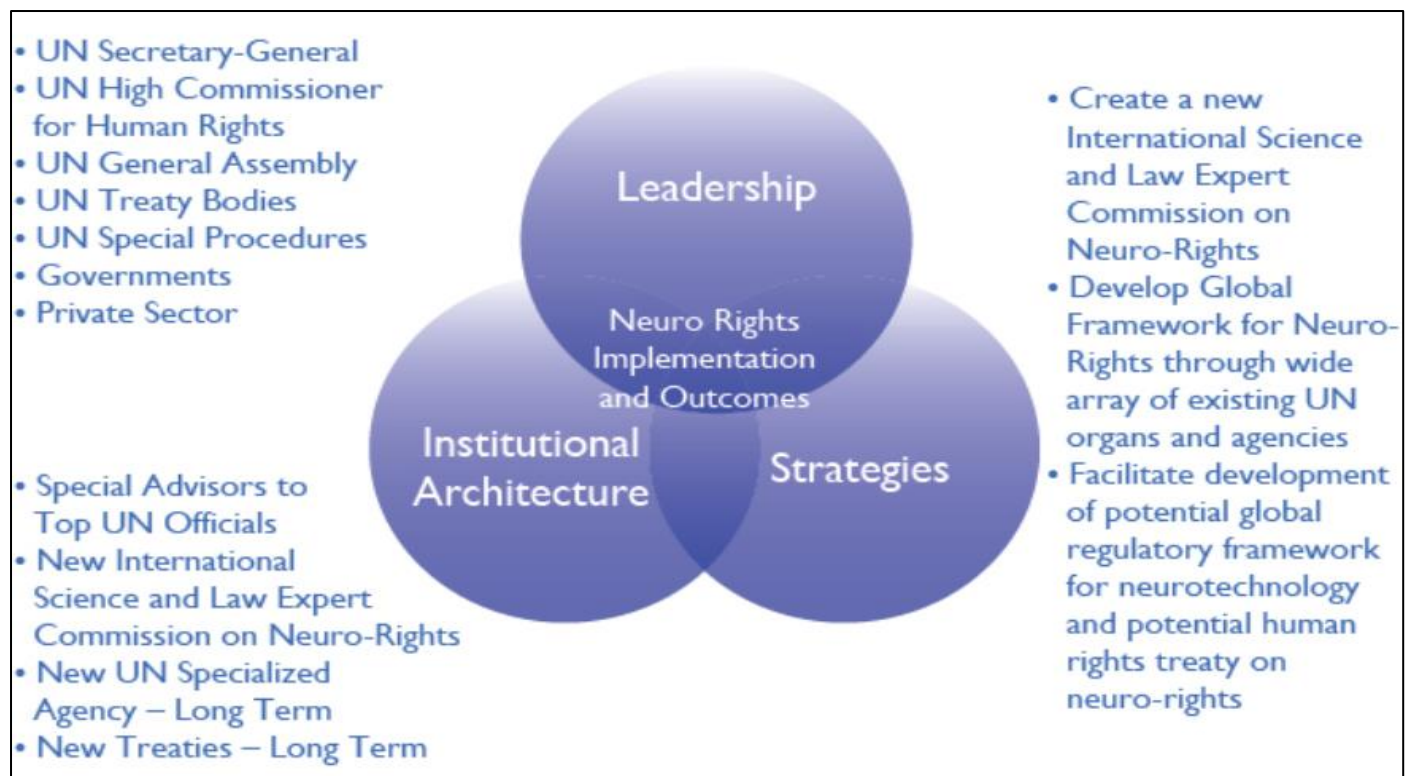
[14] Ibid 115

[15]Ibid 137-139

➢ *A Proposed U.N. Approach for Advancing Neuro-Rights in the Age of Neurotechnology:*

Fig 3 A Proposed U.N. Approach for Advancing Neuro-Rights in the Age of Neurotechnology

➢ *Intellectual Property and the Non-Protectability of Thought*

Intellectual property law, particularly copyright and patent regimes, traditionally draws a line between ideas and expressions. Under most legal systems, including Indian copyright law, an idea must be fixed in a tangible form such as text, code, or artwork to qualify for protection.[17] Brain data, especially in its raw form (e.g., EEG signals), typically does not meet this threshold of fixation or originality. Consequently, individuals have no IP claim over their cognitive signals unless these are transformed into expressive content via BCI-mediated outputs.

This gap becomes problematic when corporations use proprietary software to process and generate value from brain data. While companies may claim trade secret or patent protection over the algorithms used to decode neural signals, the individuals generating that data have no corresponding rights, unless they are deemed co-creators an unlikely legal outcome under current frameworks. This asymmetry enables corporate ownership of value derived from the brain, without recognising the cognitive labour or consent of the data subject.

➢ *Data Protection Laws and the Limits of Consent*

Data protection laws offer some limited protections, but these are inadequate for the complexity of brain data. The European Union's General Data Protection Regulation (GDPR) identifies biometric and health data as sensitive and requires explicit consent for processing such information.[18] However, the GDPR does not specifically address neurodata or cognitive signals unless linked directly to identifiable health outcomes. Moreover, the GDPR's reliance on consent as a legal basis becomes problematic in contexts where users cannot fully understand or control what data is being collected or how it is being used.

In India, the Digital Personal Data Protection Act, 2023 (DPDPA) represents a significant development in privacy regulation. However, it remains broad and underdefined in its treatment of sensitive personal data. Section 2(n) defines "personal data" as any data about an individual who is identifiable, but it lacks detailed categorisation of cognitive or neural data.[19] Consent, under the Act, is treated as a general requirement, but the mechanisms to ensure that consent is informed, specific, and revocable—especially in high-risk cases like brain data—are underdeveloped.

Further, both the GDPR and DPDPA suffer from an overreliance on the "notice-and-consent" model, where responsibility is placed on the data subject to read, understand, and agree to data use policies. As Zuboff has argued, this model is deeply flawed in digital environments

---

[16] Copyright Act 1957 (India) s 13(1); see also *Eastern Book Company v D B Modak* (2008) 1 SCC 1

[17] Regulation (EU) 2016/679 (General Data Protection Regulation), art 9.
[18] Digital Personal Data Protection Act 2023 (India), s 2(n).

where information asymmetry and platform dependency undermine genuine choice.[20]

> *Chile's Neurorights Law: A Pioneering Model*

In 2021, Chile became the first country to explicitly address the legal and ethical implications of neurotechnology by introducing neurorights into its national constitution.[21] The reform proposed the recognition of cognitive liberty, mental privacy, and the right to personal identity as fundamental human rights. Most importantly, the law provides the rules regarding free and informed consent for the use of neurotechnologies recognising the brain as a protected domain.

The reason that the Chilean model is important is threefold. First, it shows an insight that neural data is not a medical or biometric data, it is rather a separate category that involves autonomy and identity. Second, it acknowledges the boundaries of the standard consent and suggests a tighter transparency and human control requirement. Last, it flags a change from market arrangements to rights-based regulation, reframing the use of neurotechnology as not just commerce, but justice.

III. CONCLUSION

A pressing reform is needed in the legal and ethical treatment of brain data. Neural data privacy protection paradigms currently in place do not account for the nature of neural data as being uniquely intimate, involuntary, and predictive, and therefore do not deliver meaningful consent protection. Although Locke's theory underwrites ownership by the individuals via mental labour, and Zuboff exposes how inequalities undermine voluntariness, the way ahead is to reconceive consent as a living, relational right which can be revoked. Consent must be informed, specific, and tied to transparent use; users must retain real-time control and the ability to withdraw it. Legal systems must also recognise cognitive liberty as a fundamental right and extend IP protections to neuro-generated outputs, particularly when mediated through assistive technologies. Only by grounding consent in dignity and cognitive autonomy—not in passive agreement—can law respond to the challenges posed by neurotechnology and protect the most private domain of all: the human mind.

---

[19] Shoshana Zuboff, *The Age of Surveillance Capitalism* (PublicAffairs 2019) 115–119.

[20] Francisco José Vera and Rafael Yuste, 'Neurotechnologies and Human Rights' (2021) 5 *Nature Human Behaviour* 420.