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**NEURO TECHNOLOGIES: A SYMPHONY OF OPPORTUNITIES, RISKS,  
AND HUMAN RIGHTS SAFEGUARDS**- UbithaP.K<sup>1</sup>**Abstract**

Neurotechnology and advancements in brain-computer interfaces (BCIs) provide unique insights into the human brain, enabling enhanced manipulation, brain activity analysis, and brain data access. This progress raises significant ethical and legal concerns about personal identity, autonomy, freedom of thought, mental privacy, creativity, and integrity. Mental health is a critical consideration for all employees, including neurodivergent individuals. Existing legal frameworks primarily emphasize the "locus externus," integrating neurodivergent individuals into the workplace, but may insufficiently consider psychological and psychiatric factors impacting mental well-being. This research focuses on the intersection of "neuro discrimination" and the "workplace," with particular emphasis on the "mental" and "psychiatric" aspects in the International Law Perspective. Additionally, it explores initiatives within the European Union in this context. By exploring these dimensions, the study seeks to contribute to a more comprehensive understanding of the implications of neurotechnology in the workplace and propose recommendations for addressing mental health concerns, privacy, and integrity within this evolving landscape.

*Keywords:* Brain-computer interfaces (BCIs), Human Rights, Locus Externus, Locus Internus, Neuro discrimination, Neuro Equality, Neuro Technology, Workplace

**Introduction**

The concept of neurodiversity, initially introduced by Australian sociologist Judy Singer in 1998, aims to recognize the inherent diversity of human brain function. Since then, this concept has expanded to encompass a broader range of neurodiverse conditions beyond autism to include

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dyslexia, ADHD, Tourette's syndrome, dyspraxia, dyscalculia and obsessive-compulsive disorder. Discrimination against people with these conditions in society and the workplace is a form of bias and stigmatization. These factors that favour psychological discrimination can be divided into three main groups: individual factors (ignorance, fear, bias), interpersonal factors (communication barriers, power dynamics) and systemic factors (policies, practices, norms). Combating mental discrimination in the workplace is rooted in the principles of neurodiversity, social justice, and human rights. Employers, employees, and other stakeholders should adopt a proactive, participatory, and inclusive approach to nurture a workplace culture characterized by respect, diversity, and equality (as discussed in Damian Mellifont's article, "Facilitator's and Inhibitors of Mental Discrimination in the Workplace: A Comprehensive Review").<sup>2</sup>

Employer's attitudes are influenced by their personal experiences, knowledge, and interactions with individuals with disabilities, as well as the prevailing organizational culture and policies in their workplace (as highlighted in Darlene Unger's 2002 paper titled "Employer's Attitudes Toward Persons with Disabilities in the Workforce: Myths or Realities?").<sup>3</sup> The inclusion of neurodivergent individuals requires supportive environments and workplace accommodations. These accommodations can reshape perceptions and mitigate biases, ultimately fostering greater understanding and empathy and contributing to a more inclusive workplace (as discussed in a 2018 article by Hickox, Stacy, and Hall).<sup>4</sup>

Recently, a prominently used term is "Neuro-equality," which refers to the idea that different neurotypes, such as those associated with autism, ADHD, dyslexia, and other neurodiversity, should have equal opportunities and rights in society and the workplace. It highlights the significance of embracing cognitive differences as an inherent facet of human diversity and advocates for challenging a simplified model that views these differences as deficits simply because they do not conform to typical developmental norms. Furthermore, "Neuro-equality"

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<sup>2</sup>Mellifont, D, 'Facilitators and Inhibitors of Mental Discrimination in the Workplace: A Traditional Review. Studies in Social Justice (2021).

<sup>3</sup>Unger. D, 'Employers' Attitudes Toward Persons with Disabilities in the Workforce Myths or Realities? Focus on Autism and Other Developmental Disabilities' (2002).

<sup>4</sup>Hickox, Stacy & Hall, Angela, 'Atypical Accommodations for Employees with Psychiatric Disabilities: Atypical Accommodations for Employees' (2018) American Business Law Journal.

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places great importance on creating psychological safety in the workplace (OECD Forum Network).<sup>5</sup>

### **Neuro Technologies: Opportunities, Risks, and Human Rights**

The incorporation of neuro technologies unveils numerous opportunities within the context of human rights. Particularly noteworthy is their potential to substantially improve the quality of life for individuals with disabilities by facilitating enhanced communication and interaction with the surrounding world. Additionally, they can play a crucial role in the diagnosis and treatment of various neurological disorders, such as Parkinson's disease, epilepsy, and depression. Furthermore, the application of neurotechnology's extends to augmenting human performance in diverse fields, including the workplace, education, and the military. However, alongside these opportunities, adopting neuro technologies brings forth several risks and challenges that can impact human rights. For instance, using neuro technologies for surveillance raises concerns regarding the right to privacy and freedom of thought. Striking a balance between these opportunities and risks becomes imperative to ensure the development and utilization of neuro technologies align with human rights principles and values.

Neurotechnology's also have the potential to revolutionize communication for individuals with impairments, such as locked-in syndrome or speech disorders, through brain-computer interfaces (BCIs). While these technologies empower effective communication, their development and use must align with human rights principles, emphasizing the need for a comprehensive regulatory framework. Assistive devices powered by neuro technologies can enhance the mobility and autonomy of individuals with cognitive and physical disabilities, promoting their active participation in society. However, careful navigation of their integration is vital to safeguard human rights, requiring the implementation of a robust regulatory framework.

In the realm of the workplace, the concept of neurodiversity gains paramount importance, emphasizing the unique ways in which neurodivergent individuals interact with others and perceive the world. Establishing an inclusive and supportive environment is crucial for unlocking the full potential of neurodiverse employees, leading to empowerment for both individuals and

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<sup>5</sup>Charlotte Valeur, 'From the Shopfloor to the Boardroom: Neuro-equality in society and in the workplace[2022] <https://www.oecd-forum.org/posts/from-the-shopfloor-to-the-boardroom-neuro-equality-in-society-and-in-the-workplace>.

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the organizations they serve. This empowerment fosters increased innovation, adaptability, and creativity, supported by reasonable workplace accommodations and a focus on education, awareness, and policy changes promoting diversity and equitable opportunities. The multifaceted benefits of neuro technologies encompass advancements in healthcare, particularly in diagnosing and treating neurological disorders and mental health conditions. However, their development and use must align with human rights principles, underscoring the importance of a comprehensive regulatory framework to address associated risks and challenges.

Advancements in neuro technologies can also contribute to managing chronic pain and neurological conditions, potentially improving the quality of life for individuals with pain-related disabilities. Despite promising outcomes, ensuring adherence to human rights principles requires a comprehensive regulatory framework. Addressing the legal and ethical dimensions of discrimination against individuals with mental health conditions is crucial in aligning workplace practices with anti-discrimination laws. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) provides a framework for advancing, protecting, and guaranteeing human rights for individuals with disabilities, including principles relevant to neurodiversity in the workplace.

In the European Union, a comparative legal analysis reveals distinct approaches across Member States, emphasizing the compelling need for codified legislation to safeguard the comprehensive and equitable enjoyment of human rights for individuals with mental disabilities.

## **Regulatory Challenges and Human Rights Safeguards in the Realm of Neuro Technologies**

The European Union (EU) is committed to discrimination and enhancing the well-being of individuals with disabilities through various initiatives. The EU's new 2021-2030 plan builds upon these ongoing efforts, aiming to ensure that all individuals with disabilities in the EU can fully exercise their human rights and enjoy equal access to opportunities. These attempts provide support not only to neurodivergent individuals but also to those facing long-term mental or intellectual impairments. The EU's dedication to fostering an inclusive and equitable society is

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exemplified through these proactive measures.<sup>6</sup> The World Health Organization (WHO) has issued comprehensive guidelines regarding promoting and protecting mental health within the workplace. According to the WHO, unfavourable working conditions, characterized by factors such as discrimination, inequality, excessive workloads, limited job control, and job insecurity, can pose a significant risk to mental health. In response, the WHO recommends a series of interventions to promote and preserve mental well-being in the workplace.<sup>7</sup> These interventions encompass raising awareness about the importance of mental health, providing employees with information on available support, involving employees in decision-making processes, offering programs for career development, and recognizing and rewarding exceptional work performance.

The growing prevalence of workplace-oriented brain-computer interfaces connected to the Internet raises heightened concerns. The integration of enterprise-grade brain-computer interfaces in professional settings amplifies these considerations, prompting a need for careful evaluation and robust security measures. To protect the right to privacy in neuro technologies, stringent data collection, storage, and usage regulations are crucial to prevent unauthorized access and misuse of neural information. Establishing a right to mental privacy is essential to shield individuals from unwarranted intrusion into their brain data and prevent unauthorized collection of such data. This right safeguard individuals' autonomy over their thoughts and mental processes, protecting them from interference or manipulation.

The emergence of advanced neuro technologies introduces the risk of unauthorized access to neural activity, posing mental intrusion or manipulation threats. Legal and ethical boundaries are necessary to ensure that individuals' mental processes remain immune to manipulation or coercion without explicit consent. Preserving mental integrity may also include a right to psychological continuity, as proposed by Ienca and Andorno in 2017.<sup>8</sup> This right protects individuals' identity and the uninterrupted flow of their mental lives from external alterations without informed consent. In contexts like national security, where arguments for mandatory

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<sup>6</sup>Lighthart, S. D, 'Forensic Brain-Reading and Mental Privacy in European Human Rights Law: Foundations and Challenges' (2021) *Neuroethics* , 14, 191–203.

<sup>7</sup>World Employment and Social Outlook Trends (2022), International Labour Office, Geneva, 9789220356975[ISBN].

<sup>8</sup>Ienca, M. a. Gianclaudio, 'Mental Data Protection and the GDPR' (2022) *Journal of Law and the Biosciences*, forthcoming.

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personality-changing interventions may arise, the concept of psychological continuity gains significance. Addressing these challenges is crucial in developing technologies that impact mental integrity.

The widespread availability of neurotechnology's has the potential to exacerbate social inequalities. In a scenario where neuroenhancements become prevalent, individuals with better means or healthcare access may gain cognitive advantages, creating disparities. Preserving the right to equality requires efforts to ensure fair distribution of neuro technologies, preventing discrimination based on cognitive abilities. Current researches predominantly address discrimination against neurodivergent individuals from an external perspective, often referred to as the "locus externus." Neuro technologies, particularly those associated with brain-computer interfaces (BCIs), pose significant privacy concerns. These advancements facilitate accessing, recording, or transmitting an individual's neural data, revealing sensitive information about their thoughts, emotions, and mental states. The privacy risks at the neural level surpass traditional breaches, as they can bypass conscious reasoning, leaving individuals vulnerable to involuntary mind reading.

### **Neuro Technologies and the Right to Freedom of Thought: Ethical Implications and Human Rights Concerns**

Neurotechnology's profoundly impact the fundamental human right to freedom of thought, as recognized by International Human Rights instruments. These technologies link directly with the human brain, enabling bidirectional communication between the brain and external devices. This unique form of interaction distinguishes them from conventional technologies that rely on peripheral interfaces. By directly interfacing with the brain, neurotechnology's intrude upon the central processing unit of mental faculties, influencing memory, reasoning, emotions, and perception, thus affecting the core of human identity. The distinctive features of brain data pose ethical challenges, as these data often elude conscious control, complicating intentional seclusion. Neural data encode mental information, including thoughts and feelings, raising ethical concerns about decoding.

Individuals face obstacles in exercising rights such as accessing, editing, and deleting their data, with real-time modifications through neurostimulation or neuromodulation allowing direct

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influence on cognition, behaviour, and mood. Neural data introduce the potential for "neuro discrimination," where individuals may face discrimination based on their neural signatures, revealing predispositions and considerations related to mental health, personality traits, cognitive performance, intentions, and emotional states. The right to freedom of thought entitles individuals to hold their beliefs, opinions, and thoughts without interference, coercion, or discrimination. Neuro technologies, especially BCIs, may infringe on this right if users' innermost cognitive processes face unauthorized scrutiny and influence.

The misuse of neurotechnology's could compromise autonomy and the right to independent thought. Questions about the boundaries between natural and artificially enhanced cognitive abilities also arise, impacting individuals' sense of self and identity. Scholars advocate for a right to cognitive liberty, emphasizing individuals' control over their cognitive functions and the freedom to explore thoughts and beliefs without interference. Given the sensitivity of neural data, implementing stringent data security measures and clear regulations is crucial to safeguard the privacy of individuals. Obtaining informed consent in neurotechnology's is challenging due to the complexity of the technology and potential unforeseen long-term effects, risking individuals not comprehensively understanding the implications and inadvertently relinquishing control over their cognitive processes.

The application of neurotechnology's for cognitive enhancement holds the potential to exacerbate societal inequalities. The availability of these enhancements may be restricted to specific privileged groups, amplifying existing disparities and creating a "cognitive divide" between those who can afford enhancements and those who cannot. The use of neurotechnology's for cognitive enhancement has the potential to generate societal disparities. Accessibility to these enhancements may be limited to specific privileged groups, accentuating existing inequalities and fostering a "cognitive divide" between those with the financial means for enhancements and those without.

The inappropriate application of neuro technologies, whether for unauthorized surveillance, illicit behavioural influence, or other malicious purposes, poses significant ethical dilemmas.

Striking a delicate balance between beneficial uses and the potential for harm becomes crucial in regulating the development and deployment of these technologies. The unethical utilization of neuro technologies for unauthorized surveillance, illicit behavioural influence, or other malicious

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purposes raises profound ethical concerns. It is imperative to find the appropriate equilibrium between their beneficial applications and the potential for harm to regulate their development and deployment effectively. The potential misuse of neuro technologies in the workplace to manipulate or exert control over individuals without their consent raises concerns about potential abuses in areas such as labour practices within the context of employment and labour law. In the rapidly evolving landscape of neurotechnology's, our comprehension of their enduring impacts on the brain and overall health still needs to be completed, raising concerns about unforeseen risks and health consequences that may emerge over time.

This uncertainty underscores the critical need for vigilant monitoring and continuous research to ensure the responsible development and deployment of these advancements. Communities grappling with socioeconomic disadvantages are vulnerable due to limited access to healthcare and technology. This creates a challenging dynamic in embracing neurotechnological progress, potentially exacerbating societal inequalities.

The emergence of what can be termed a "cognitive divide" is a real risk, where privileged groups with access to cognitive enhancements may be on a divergent path from those without such access. The youth, in particular, face elevated risks as their developing brains encounter the influence of neurotechnology's. The effects on cognitive development and long-term health are not fully understood, rendering them susceptible to potential risks and unintended consequences. This raises ethical concerns, especially regarding informed consent and autonomy, as minors may not grasp the full implications of engaging with such technologies. Ienca & Malgieri (2022)<sup>9</sup> propose a groundbreaking solution in the form of a "Mental Data Protection Impact Assessment" (MDPIA).

This specialized procedure aims to enhance evaluating and mitigating risks associated with processing mental data, thereby safeguarding fundamental rights and freedoms. According to the MDPIA model, mental data processing is classified as high-risk, imposing crucial obligations on the controller. As we navigate this uncharted terrain of neurotechnology's, we must prioritize ethical considerations, informed consent, and ongoing research. Adopting frameworks such as MDPIA can serve as a crucial step towards ensuring that the development and integration of neuro technologies align with ethical principles and safeguard the well-being of individuals,

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<sup>9</sup>Ienca, 'Mental Data Protection'.

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particularly the vulnerable. Only through a concerted effort to address these challenges can we unlock the full potential of neurotechnology's while minimizing risks and promoting a more equitable and responsible future.

Neuro technologies, encompassing tools that monitor, measure, manipulate, or enhance brain activity and functions, offer promising benefits for human health. However, they also pose significant ethical and legal challenges concerning human rights. To identify and assess potential risks and impacts on human rights, it is imperative to develop ethical frameworks and guidelines rooted in human dignity, autonomy, justice, and solidarity principles. This is essential for integrating neurotechnology's into various aspects of human life.

This approach recognizes the diverse nature of human experiences and aims to address the unique needs and vulnerabilities present within different groups. When considering human dignity, these ethical guidelines prioritize the intrinsic worth of every individual, irrespective of their background or neurodiversity. The primary focus is safeguarding individuals from potential exploitation or dehumanization, ensuring that the application of neurotechnology's upholds and enhances their inherent dignity. Autonomy takes centre stage in ethical considerations, emphasizing the right of individuals to make informed decisions about the use of neurotechnology's. Transparency in providing information about potential risks, benefits, and alternatives becomes crucial. These guidelines stress the importance of preserving individual autonomy, allowing people to choose their engagement with neurotechnological interventions without coercion or undue influence.

Through these ethical principles, we can navigate the complex terrain of neurotechnology's with a commitment to respecting human rights and promoting responsible and equitable integration. Justice concerns in neurotechnological advancements revolve around achieving equitable access, aiming to minimize disparities based on socioeconomic status or geographical location. The ethical framework seeks a just distribution of benefits and burdens associated with neuro technologies, ensuring that no particular group disproportionately bears negative consequences. Promoting solidarity becomes a shared commitment to societal responsibility, ensuring the collective well-being of all individuals.

These ethical guidelines foster a sense of shared responsibility, actively recognizing and supporting those who may be more vulnerable or marginalized. Prioritizing inclusivity, the needs

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of diverse communities are actively addressed. Respect for diversity extends beyond cultural considerations to encompass an acknowledgement of neurodiversity. Ethical frameworks advocate for a culturally sensitive approach that values diverse perspectives. Furthermore, recognizing and accommodating a wide range of neurological variations ensures that neurotechnology's are developed with sensitivity to diverse cognitive abilities and needs. Addressing the vulnerabilities of different groups is a core tenet of these ethical guidelines. Special protections are implemented for specific groups, such as children, elderly individuals, and those with cognitive impairments. These provisions are designed to safeguard the rights and well-being of these populations, ensuring that the integration of neuro technologies remains responsible and considerate.

Additionally, involving individuals with disabilities and other affected communities in the research process enhances inclusivity and ensures a comprehensive understanding of the multifaceted implications of neurotechnology's. Establishing oversight and regulatory measures is crucial to guarantee neuro technologies' safety, quality, and accountability. These mechanisms safeguard fundamental rights, including personal identity, free will, mental privacy, equitable access to mental augmentation, and protection against algorithmic bias. Encouraging public awareness and education regarding the potential and challenges of neurotechnology's is essential. This involves cultivating a culture of open dialogue and thoughtful deliberation among diverse actors and sectors within society.

Numerous gaps in international regulatory and governance frameworks about neurotechnology and human rights have been pinpointed. The International Bioethics Committee (IBC) of UNESCO released a report on the ethical dimensions of neurotechnology in December 2021,<sup>10</sup> underscoring the necessity for a comprehensive regulatory framework to address the risks and challenges neurotechnology's pose to human rights. This report also underscores the vital need to ensure that the development and application of neuro technologies align with the principles and values of human rights. In another report by Jared Genser, Stephanie Herrmann, and Rafael Yuste, titled "International Human Rights Protection Gaps in the Age of

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<sup>10</sup>Report of the International Bioethics Committee of UNESCO (IBC), 'The ethical issues of neurotechnology' [2021] <https://en.unesco.org/themes/ethics-science-and-technology/ibc/reports-and-advice>.

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Neurotechnology,"<sup>11</sup> several deficiencies in the international human rights framework are identified.

These gaps require attention to guarantee that the advancement and utilization of neurotechnology's remain based on human rights principles. Additionally, the Office of the United Nations High Commissioner for Human Rights (OHCHR) has studied neurotechnology's impact, opportunities, and challenges concerning promoting and safeguarding all human rights. The study furnishes recommendations on safeguarding human rights within the context of neurotechnology, contributing valuable insights into addressing these critical issues.

### **Challenges and Recommendations**

A noticeable gap in the literature concerning the "locus internus" involves safeguarding aspects such as mental privacy and integrity. This research aims to address this gap, particularly emphasizing the "mental" or "psychiatric" facets of neurodiversity within the context of international law. Neurotechnology's present opportunities to enhance our understanding of the brain and cognitive processes, offering insights that can shape policies and interventions in support of human rights. However, realizing these benefits requires ensuring that the development and use of neuro technologies adhere to human rights principles and values, highlighting the necessity for a comprehensive regulatory framework. A more profound understanding of neurodiversity facilitated by neuro technologies has the potential to foster increased acceptance and appreciation of diverse neurotypes, ultimately reducing discrimination and stigma. While these advancements hold promising possibilities, it is crucial to guarantee that the development and use of neuro technologies align with human rights principles and values, necessitating a comprehensive regulatory framework.

In data protection, various principles, such as the requirement for informed consent and safeguarding personal data, extend to neuro technologies. It is critical to ensure that the development and use of these technologies align with human rights principles and values. The potential risks and challenges associated with using neurotechnology's require establishing a comprehensive regulatory framework, especially concerning data privacy and security issues.

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<sup>11</sup>Jared Genser, Stephanie Herrmann, and Rafael Yuste, 'International Human Rights Protection Gaps in the Age of Neurotechnology' [2022] NeurorightsFoundationPUBLICAnalysis5.6.22.pdf (columbia.edu).

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While neuro technologies present numerous opportunities for human rights advancement, their integration must be approached with a keen awareness of potential risks and ethical considerations. A robust regulatory framework is indispensable to strike a delicate balance between harnessing the benefits of neurotechnology's and safeguarding fundamental human rights.

Despite these potential overlaps, gaps remain in protecting mental privacy and personal brain data. Privacy is predicated upon the conscious ability of the individual to filter the flow of data and intentionally seclude private information. Brain data, in contrast, are mainly elusive to conscious control and, hence, cannot always be intentionally secluded. While this problem is shared with other data types (e.g., genetic data), it acquires greater ethical complexity in the neural domain. Specifically, brain data admits there is no separation between the data processed and the system that makes decisions about their processing (the human brain). The brain information is the ultimate resort of informational privacy since it includes unexecuted behaviour, inner speech, or other non-externalized actions.

In principle, mental privacy can be preserved even if individual behaviour is constantly surveilled through activity tracking, personal digital technology, self-quantification, or simple observation. When one agrees to allow brain data to be acquired, one seems to surrender the right to mental privacy, at least to some degree. AI-driven brain data processing may allow access to mental information and bring privacy debates into partially uncharted territory. Legal systems are well-equipped to protect the 'locus externus' (behaviour, verbal utterances, written text, etc.) but less equipped to protect the 'locus internus' (e.g., unspoken information, preconscious preferences, attitudes, and beliefs).

Securing consent is a pivotal element in ensuring data protection. The distinctive characteristics of brain data present obstacles to maintaining mental privacy and data security, giving rise to apprehensions regarding the issues of consent, control, and the potential for coercion. For consent to be deemed valid, as the European Commission outlines, it must be freely given, informed, and granted for a specific purpose. The individual should be free to choose without undue influence and retain the ability to refuse or retract consent without facing any disadvantages. The details regarding consent must be communicated in a manner that is comprehensible to the average person, ensuring a clear understanding of the precise nature of

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what is being consented to. If the request for consent is clear, broad, and challenging to comprehend, it will be considered valid. It is essential to highlight that consent lacks validity when a clear imbalance exists between the individual and the business or organization, as seen in employer-employee relationships.

Additionally, suppose a business or organization mandates individuals to consent to processing unnecessary personal data as a prerequisite for fulfilling a contract or service. In that case, the consent is not considered valid. Furthermore, informed consent plays a pivotal role in data protection, as the European Commission specifies. For consent to be valid, it must be freely given, informed, and granted for a specific purpose. Individuals must be free to choose, refuse, or withdraw consent without any disadvantages. The information related to consent should be presented in a manner comprehensible to the average person, ensuring a clear understanding of the nature of the consent. If the request for consent is clear, broad, and challenging to understand, it is deemed valid.

If someone grants informed consent for their data to be processed for a specific purpose but is unaware of later uses for different purposes, including harvesting or extracting by third parties, the consent becomes invalid. Individuals must be informed about the purpose of processing operations to safeguard against 'function creep.' Moreover, according to the European Commission, consent lacks validity when there is a discernible imbalance between the individual and the business or organization, such as in employer-employee relationships. If an individual is coerced into collecting their data, for example, through an employer's mandate or in an interrogation context, the consent is not considered valid. Individuals must have a free choice and the ability to refuse or withdraw consent without being disadvantaged.

Brain data's characteristics can hinder subjects from effectively exercising their rights to access, edit, and delete their data. For example, a data subject might lack a powerful computer to process data from a Brain-Computer Interface (BCI). Similarly, deleting brain data could significantly reduce the accuracy of Machine Learning (ML) models generated with this information. Moreover, processing brain data introduces a risk of "neuro discrimination," involving discrimination based on a person's neural signatures, such as indications of a predisposition to dementia or factors like mental health, personality traits, cognitive performance, intentions, and emotional states.

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International mechanisms and platforms strengthen accountability by establishing and reinforcing platforms for monitoring, evaluating, and reporting human rights implications. Examples include the Human Rights Council Advisory Committee, the Council of Europe Committee on Bioethics, and the UNESCO International Bioethics Committee, enhancing information exchange and accountability. International cooperation and coordination are crucial, promoting collaboration among governments, intergovernmental organizations, civil society, academia, and industry on research, development, and governance of neurotechnology's. Initiatives like the OECD Recommendation on Responsible Innovation in Neurotechnology and the Neuro Rights Initiative foster knowledge sharing and a culture of discussion. Implementing these actions may depend on political will, financial resources, technical capacity, and public awareness. However, given the transformative potential of neuro technologies, urgent and comprehensive global action is essential. A human rights-based response is necessary to navigate these advancements' profound and unprecedented implications.

The mental well-being of all employees, including neurodivergent individuals, is a crucial concern. The European Parliament has urged EU institutions and Member States to recognize work-related mental health issues across the EU. Additionally, the Chartered Institute of Personnel and Development (CIPD) has provided

- a guide for HR professionals and leaders across departments,
- aiming to enhance understanding of neurodiversity,
- its organizational benefits and
- methods to support neurodivergent individuals for workplace comfort and success.

Notably, the European Parliament's resolution on work-related mental health lacks explicit consideration of the right to mental privacy and integrity. While these frameworks focus on integrating neurodivergent individuals into the workplace, they may overlook the psychological and psychiatric factors influencing their mental well-being. Moreover, the threat of unemployment poses a significant challenge for neurodivergent individuals in maintaining an independent life. Therefore, there is a crucial need for research to shift its focus to the "locus internus," delving into the psychological and psychiatric aspects affecting the well-being of neurodivergent individuals both within and outside the workplace.

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Establishing a national regulation or framework is imperative to mitigate neurotechnology's potential adverse human rights impacts. A study published in the open-access journal *Life Sciences, Society and Policy* suggests that four new human rights laws could emerge to safeguard against exploitation and privacy loss. The Council of Europe has proposed creating an Interpretative Guide to Adapt Existing Human Rights to Neurotechnology's, ensuring that the protection of human rights remains a guiding consideration throughout the entire research, development, and application process. It is crucial to acknowledge that the field of neurotechnology is rapidly evolving, and the legal and ethical frameworks surrounding it are still under development. Therefore, ongoing monitoring and evaluation of the impact of neurotechnology on human rights is essential, with a commitment to adapting regulations and frameworks accordingly.

Addressing neurotechnology's ethical and legal implications presents another complex challenge, with countries exhibiting variations in preparedness and capacity. The current International Human Rights law needs to explicitly address the implications of neurotechnology on human rights, creating a challenge in acknowledging its impact. The impact of neurotechnology on human rights is a nuanced and intricate matter. Responding to this complexity, the United Nations Human Rights Council has tasked the Advisory Committee with conducting a comprehensive study on neurotechnology's effects, opportunities, and challenges concerning promoting and protecting all human rights.<sup>12</sup> The study aims to furnish recommendations that enable the Human Rights Council and its specialized procedures and subsidiary bodies to address the multifaceted landscape of human rights opportunities, challenges, and gaps stemming from the rapid advancements in neurotechnology.

International human rights law does not explicitly encompass references to neurotechnology or artificial intelligence (AI). Nevertheless, it is discernible that neurotechnology holds the potential to transform our understanding of the brain, concurrently harbouring the capacity to impact human rights adversely, including privacy rights, freedom of thought, mental integrity, freedom from discrimination, and the principle against self-incrimination.

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<sup>12</sup>OHCHR, 'Neurotechnology and human rights' [2023] Neurotechnology and human rights | OHCHR.

Evaluating the effectiveness of national institutional frameworks for human rights involves considering various criteria. National Human Rights Institutions (NHRIs) are crucial, serving as independent bodies mandated to promote and protect human rights domestically. The assessment of their effectiveness relies on compliance with the Paris Principles, emphasizing independence, pluralism, and accountability. Ensuring alignment with international standards involves evaluating national laws and policies against global human rights principles, particularly those outlined in "Neuro Rights." These principles address crucial aspects such as personal identity, free will, mental privacy, equal access to mental augmentation, and protection from algorithmic bias. Developing and adopting a universal declaration or convention are pivotal, grounded in existing human rights frameworks and the proposed "Neuro Rights." This initiative emphasizes the need to address international human rights protection gaps in the age of neurotechnology, promote innovation, and ensure ethical development.

Risks associated with neurotechnology, including exploitation, privacy loss, and discrimination, underscore the importance of a regulatory framework that encourages safe and ethical development while safeguarding human rights. Five innovative human rights have emerged to address these concerns within emerging neurotechnology's. These Neuro Rights encompass the right to personal identity, free will, mental privacy, equal access to mental augmentation, and protection from algorithmic bias.

The current international human rights framework can be optimized or further developed by integrating the concept of Neuro Rights. Providing recommendations on addressing the opportunities, challenges, and gaps arising from neurotechnology, the framework could be enhanced by incorporating the principles of Neuro Rights. This ensures a coherent, holistic, inclusive, and action-oriented approach by the Human Rights Council and its special procedures and subsidiary bodies.

## Conclusion

In the nexus of neurodiversity, workplace inclusion becomes a cornerstone for unlocking innovation and creativity. Establishing environments that accommodate neurodivergent individuals fosters empowerment and enriches organizational dynamics. Legal frameworks, shaped by the principles of the United Nations Convention on the Rights of Persons with

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Disabilities (UNCRPD), are imperative to ensure equitable treatment and protect against discrimination. However, as we traverse the landscape of neurotechnology, a confluence of challenges and opportunities emerges. While these technologies hold immense potential for understanding cognitive processes, their integration necessitates a meticulous regulatory framework. The ethical considerations surrounding neurotechnology's, ranging from data privacy to consent, demand a delicate balance between progress and protection.

The advent of "Neuro Rights" proposes a conceptual framework to grapple with the intricacies of this technological frontier. Addressing personal identity, free will, mental privacy, equal access to mental augmentation, and protection from algorithmic bias, these rights act as a compass for ethical and legal navigation. A unified global regulatory approach is imperative to guide the responsible development and deployment of neuro technologies. As the international community delves into the intersection of neurotechnology and human rights, the ongoing study by the United Nations Human Rights Council signifies a concerted effort to comprehend the multifaceted implications and chart a course forward. In essence, this journey encompasses more than technological advancements; it is about safeguarding the rights and dignity of individuals. The right balance between innovation and ethical considerations is pivotal for ensuring that our progress in neurotechnology aligns seamlessly with human rights principles, contributing to a future where diversity is celebrated, technology is ethical, and rights remain inviolable.

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