



Cognitive Insights for Artificial Intelligence

Input to a report by the United Nations (UN) Office of the High Commissioner for Human Rights (OHCHR) on “The right to privacy in the digital age (2022).”

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On behalf of Cognitive Insights for Artificial Intelligence (CifAI), we provide input to the UN, Office of the High Commissioner for Human Rights (OHCHR) report on “The Right to Privacy in the Digital Age (2022)” and endorse its content.

We at CifAI provide strategic research-based solutions from a human-centered perspective to ensure the safe and ethical design, development, deployment, and management of artificial intelligence (AI)-enabled autonomous systems across various industries. Our values-based approach is founded on accuracy, consistency, and context-dependency, and supports trusted data across every phase of the AI lifecycle to achieve confident and fair decision making.

In this call for input we focus on neurotechnology. Specifically, on Brain-Computer Interfaces (BCIs) and the need to globally expand existing regulation now before BCIs advance further and eventually proliferate.

We stand in agreement with the claim that the advancement of neuroscience is not the problem before us;¹ on the contrary, we have much to learn yet about how our mind/brain operates and what it means to be human because of our unique mind/brain. Instead, the problem before us is a composite of several questions: *how we use* our ever-growing knowledge from neuroscience, *what we choose to use* from that knowledge to innovate solutions to purported problems, and *when we decide* to take action to preempt future unchecked technological consequences we can foresee as a result of neuroscience innovations.

¹ Douglas Fields R. January-March, 2022. Hacking the Brain: More fantasy than reality. *The UNESCO Courier*, Wide Angle, pp. 8-9. <https://en.unesco.org/courier/2022-1/hacking-brain-more-fantasy-reality>

As such, BCIs demand immediate attention because they: (i) sit at a unique intersection of communication between humans and computers: patterns of neural activity from the brain can be read by a computer to control, for example, a prosthetic limb or mouse cursor, and electrical stimulation can be delivered to an area of the brain to generate, for example, a particular sensation;² (ii) are rapidly advancing in both areas of surgically implanted sensors and external sensors, and thus offer an array of potential applications such as neuromodulation, augmented cognition, among others;³ and (iii) are receiving increased interest for commercial use given the incalculable profitable potential of harvesting personal data from unique minds/brains.⁴ These characteristics make BCIs ripe not only for meeting certain medical needs and furthering empirical work on the mind/brain, but for their misuse and abuse by nefarious actors without the appropriate safeguards and compliance structures in place. Moreover, unseen under the aura of innovation, these characteristics underscore the lack of clarity regarding what the safe, fair and ethical use of BCIs entails beyond carefully guided medical need and approved academic research goals.

While the technology has a long way to go to achieve reliability and scalability, among other issues, and we continue to lack an understanding of exactly how information is encoded and processed by neural circuits due to the sheer complexity of our mind/brain, we are at a moment in the development of BCIs for which we can still act now for what can be in the future. Our mind/brain *is* what makes us human and each and everyone one of us unique.

We take the view that any kind of access (limited or unlimited) to, selection, manipulation, recording, possession, buying and selling, and trafficking of that which is unique to every human being —i.e. our mind/brain— without our explicit, informed consent is an invasion of our mental privacy and a violation of our personal identity. It is only a matter of time before BCIs mature enough to gain traction. To this point, Chile stands as the premier example of the type of forward-thinking legislation on neurotechnologies already enacted: a law in its constitution to protect brain rights or “neurorights”.^{5,6}

² Moxon, K., Saez, I., & Ditterich, J. 2019. Mind over Matter: Cognitive neuroengineering. *Cerebrum*, pp. 1-10. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7075497>

³ Leeb R., & Perez-Marcos, D. 2020. Brain-computer interfaces and virtual reality for neurorehabilitation. *Handbook of Clinical Neurology*, Vol 168 (3rd Series) *Brain Computer Interfaces*. N.F. Ramsey and J. del R. Millán (Eds.), pp. 183-197. <https://doi.org/10.1016/B978-0-444-63934-9.00014-7>

⁴ López Bernal, S., Huertas Celdrán, A., Martínez Pérez, G., Taynnan Barros, M., & Balasubramaniam, S. 2021. *ACM Computing Surveys*, Vol. 54, Issue January 2022, Article 11: pp-1-35. <https://doi.org/10.1145/3427376>. <https://dl.acm.org/doi/abs/10.1145/3427376>

⁵ September 2021. Chile aprueba ley para proteger los “neuroderechos” o derechos del cerebro. SWI swissinfo.ch. <https://www.swissinfo.ch/spa/chile-aprueba-ley-para-proteger-los-neuroderechos-o-derechos-del-cerebro/46990688>

⁶ Guzmán H., L. January-March 2022. Chile: Pioneering the protection of neurorights. *The UNESCO Courier*, Wide Angle, pp. 13-14. <https://en.unesco.org/courier/2022-1/chile-pioneering-protection-neurorights>

We submit the following recommendations:

1) Chile's legislation to protect neurorights should expand globally, and neurorights should be included as an indisputable human right.

- (i) Laws must protect our rights to mental privacy, mental integrity, psychological continuity, cognitive liberty and freedom, personal freedom, and self-determination, all to prevent the risk of loss to freedom of the mind.
- (ii) Laws must be inclusive and non-discriminatory. Every citizen must have equitable access to and be able to benefit from neurotechnological advances.
- (iii) Laws should be broad enough so to be revised and updated accordingly as neurotechnologies advance technically and our understanding of the mind/brain improves.
- (iv) Changes to the law must always ensure the protection of human rights.

2) Strict rules and regulations when utilizing any kind of neurotechnology must be established in order to implement ethical, legal, and theoretical aspects of neuroscience given that current neurotechnologies—and more so in the future with advancements—can modify, influence, treat, or enhance the brain through neuroengineering, neurotropics, brain imaging such as positron emission tomography, single-photon emission computed tomography, and functional magnetic resonance imaging combined with transcranial electrical stimulation, transcranial magnetic stimulation, and focused ultrasound.⁷

- (i) Standards of system-level aspects of BCIs in particular and neurotechnologies more broadly need to be urgently developed regarding user needs and performance assessment.⁸
 - (a) The protection of humans' mind/brain against the exploitation and loss of mental privacy must be ensured.
 - (b) Ethical oversight must be implemented.

3) A red line must be drawn for the use of BCIs for clinical treatment/research purposes. To delineate a clear red line, the following criteria for safe and ethical clinical/research determination are recommended:

- (i) All BCIs must be approved by the designated governmental agency, and their clinical treatment/research use strictly assigned and monitored for specific identified neurological disorders (e.g. neurodegeneration/dementia, paralysis, Alzheimer's disease, Parkinson's disease) in which the user will unquestionably benefit from its use.
- (ii) Definitions and criteria of 'unquestionable benefit to the user' must be established through agreement by an expert committee, considering the perspectives of multiple stakeholders.

⁷ Cinel, C., Valeriani, D., & Poli, R. 2019. Neurotechnologies for Human Cognitive Augmentation: Current state of the art and future prospects. *Frontiers in Human Neuroscience*, Vol. 13, Article 13: pp. 1-24. <https://www.frontiersin.org/articles/10.3389/fnhum.2019.00013/full>

⁸ IEEE. 2020. Standards Roadmap: Neurotechnologies for brain-machine interfacing. <https://standards.ieee.org/wp-content/uploads/import/documents/presentations/ieee-neurotech-for-bmi-standards-roadmap.pdf>

(iii) Any BCI used for clinical treatment/research purposes must be absolutely consented by the user or by an informed proxy in the case of a cognitively incapacitated user. This consent must extend beyond not only the understanding of and agreeing to the use of the particular BCI for treatment, but also at least:

- (a) The specific data collection process.
- (b) The specific data analysis process.
- (c) The specific data handling and storage process.

All the above necessitates full transparency and interpretability of the technology and research process, and oversight thereof.

4) Any and all BCIs identified for commercial use must be banned. *Our mental states are too unique, identifiable, and intimate to our individual identities that the commercial use of BCIs is untenable.*

- (i) Banning must prevent any possible political and commercial manipulation, buying and selling and trafficking, and the possible use of surveillance and/or cognitive correction and/or enhancement in schools or work areas.
- (ii) Banning must prevent the exploitation of the human mind/brain for financial purposes. Exceptions should never be allowed.
- (iii) Banning must be enforced for any and all commercial development and use of BCIs. Prioritization of profits over ethics should never be allowed.