MIND YOUR MIND

A Guide to Protecting your Brain Data

EBRAINS

IBI INTERNATIONAL BRAIN INITIATIVE

BRAIN AWARENESS WEEK

Developed by the EBRAINS Ethics and Society Committee, in collaboration with the International Brain Initiative, on the occasion of Brain Awareness Week 2026.

Authors (alphabetical order)

Dr. David Lyreskog, PhD
Dr. Hervé Chneiweiss, MD, PhD
Dr. Inga Ulnicane, PhD
Dr. Ioana R. Podina, PhD
Dr. Judy Illes, OC, PhD
Dr. Karin Grasenick, PhD
Dr. Karin R. Jongsma, PhD
Dr. Marcello Ienca, PhD
Robert Kroplewski, Solicitor

Mind Your Mind:
A Guide to Protecting your Brain Data

Is this guide for you?

- Do you use gaming headsets, meditation apps, or focus-tracking tools?
- Curious about what happens to your brain data?
- Want to understand how neurotechnology handles your privacy, especially when it comes to your brain and mind?
- Want to know how you can protect your privacy when using neurotechnology?

If you answered yes to any of these questions, this guide is for you.

From gaming headsets to focus-tracking apps, neurotechnologies are steadily entering our everyday lives. These tools promise better sleep, improved focus, immersive fun, and new ways to support brain health. However, as we use these devices, they collect, process, and interpret our most intimate information: neurodata.

We don't always think of our brain signals as "data," yet they are stored and analyzed much like our search history or GPS location. Just as you expect transparency in the digital world, you deserve clarity and safeguards when it involves your brain and mind.

This guide explores what neurodata are, why they matter, and how you can protect your privacy in the age of commercial neurotechnology.

What is neurotechnology?

Neurotechnology refers to devices, including systems and procedures, that interact directly with your brain and nervous system to measure, access, monitor, analyze, predict or modulate its functioning (definition inspired by the "UNESCO Recommendation on the Ethics of Neurotechnology").

Today, neurotechnology is no longer limited to laboratories or hospitals. Many commercial devices are designed to be worn as headbands, headphones, or earbuds, using sensors to detect your brain activity while you play, work, relax, or sleep. When these signals are recorded and processed, neurotech generates data about our brains, called neurodata.

What are neurodata?

Neurodata are information about the brain and spinal cord (i.e., the central nervous system) collected by neurotechnology. They come from signals that the nervous system naturally produces as it works. Some devices record fast electrical signals between brain cells known as neurons, while others track slower changes, such as blood flow to active areas of the brain. Together, these signals create a snapshot of how your brain is functioning at a given moment.

Neurodata should be treated as highly sensitive personal information. In fact, in the USA, states like California, Colorado and Montana have already passed laws specifically protecting this type of data.

Note to you. Some other technologies - such as eye tracking, heart rate monitors, or facial expression analysis - collect what UNESCO calls indirect neural data: information that can be used to infer mental states. When used for such purposes, these technologies raise concerns similar to those raised by neurotechnology, such as privacy.

What can neurotechnology "see"?

Today's commercially available devices are not about reading your thoughts (like "I'm hungry and I want pizza"), however, there is a plethora of research in this area. What they typically do is detect patterns in brain activity that are linked to how your brain is responding to certain stimuli.

For example, neurotechnology may estimate:

Attention levels: Are you focused or distracted? Is your attention steady or changing?

Emotional arousal: Are you stressed, relaxed, or excited?

Mental fatigue: How tired or overloaded does your brain appear to be?

Cognitive workload: How demanding is the task you are doing right now?

Response patterns: How does your brain react when you see an image, an advertisement, or a public figure?

Note to you. Although it may sound like science fiction, today's technology can decode some information from brain signals and convert it to language output. Implanted neurotechnology can be more precise in this respect. In research settings, neural implants have enabled people with severe physical disabilities to control robotic arms, operate devices, or communicate by translating thought into text. These advances represent remarkable progress in neuroscience and medicine. At the same time, they raise important questions about privacy and freedom of thought.

Why does mental privacy matter?

As with fingerprints, your neurodata are uniquely yours. Neurodata are deeply personal information, as they can reflect - crudely - how you think, feel, and experience the world. The protection of neurodata and mental privacy is so critical today that they are now considered fundamental human rights.

Neurotechnology should follow the “Privacy by Design” principle, meaning that privacy and data protection are built in from the very beginning, and not added in a later development stage. Privacy and data minimization - collecting only the minimum necessary data to provide an intended service - should be treated as a core design principle.

International organizations and expert bodies have developed ethical guidelines and regulation recommendations for the responsible development and use of neurotechnology. However, many consumer products do not yet fully follow these standards, partly because clear regulatory frameworks and legal accountability mechanisms are still missing. Yet laws alone are not sufficient. Professional self-regulation and moral integrity, both personal and commercial, must work alongside formal regulations to ensure meaningful governance and accountability.

In the meantime, it is important to stay informed and make more careful choices about the products you use.

Where You’ll Find Neurotechnology Today

1. Education

Neurotechnology is currently used in small-scale, experimental settings to support students with special educational needs or disabilities. In the future, some of these applications may become more common in schools and universities, particularly where they serve therapeutic or assistive purposes.

Smart User Tip:
Be cautious of neurotechnology marketed to boost performance in healthy children. These products often fail to deliver on their promises. Beyond unproven claims, using tech to gain a competitive edge in school can increase inequality and interfere with brain development. In learning environments, neurotechnology should only be used for therapeutic or assistive purposes (such as supporting neurodiversity), always requiring full transparency, parental consent, and the child’s voluntary participation.

2. Workplace and Labor

In some workplaces, wearable sensors may be used to track physiological signals linked to fatigue or cognitive workload. In safety-critical roles, such as driving or operating heavy machinery, this technology can help detect dangerous levels of tiredness. In office settings, similar tools may be used to estimate attention patterns, with the aim of optimizing workflows or break times.

By turning internal biological states into measurable data, these systems can improve safety. At the same time, they can blur the line between protecting workers and monitoring performance, raising important questions about privacy and fairness.

Smart User Tip:
In workplace settings, transparency is essential. Ask how the data will be used: is the system designed to protect health and safety, or to monitor productivity? Make sure workplace policies clearly define who can access the data and for what purpose and that information collected for safety is not reused for performance evaluation or surveillance. If your company asks you to wear neurotech (e.g., for safety or focus), request a written guarantee that your brain data will be used only for your immediate safety and never for “efficiency rankings” or career decisions.

3. Neuromarketing

In neuromarketing, companies analyze neural signals, such as changes in attention or arousal, to understand how people respond to advertisements, products, or packaging. The aim is to see what captures attention and engages the consumer for further usage. This approach shifts market research from what people say or do to how their bodies and brains respond.

Smart User Tip:
Unlike a traditional survey where you choose what to share, neuromarketing tracks reactions you cannot control. You should be cautious of “nudging”, which occurs when a device uses your brain data to send you perfectly timed ads or notifications exactly when you are most tired or suggestible. This process bypasses your conscious choice, and you should have the right to turn off all personalized reactions to protect your decision-making.

If you participate in a research or marketing study or use an app that offers rewards for your feedback, always ask how your data will be anonymized or if they are tied to your personal profile. Be aware that even when a company claims data are anonymized, it is often difficult to truly separate unique brain patterns from your identity or in app profile. Finally, be particularly careful when using these technologies during sleep or deep relaxation, as your mental defenses are lower during these states.

4. Neurofeedback and Wellness

For neurofeedback and wellness devices that are not for health purposes, per se, users receive real-time feedback, such as visual or audio cues, that reflect patterns in their neural activity. This feedback is used for purposes like improving focus, managing stress, or supporting sleep. To provide this feedback, these devices collect intimate biometric and neurodata reflecting your personal mental patterns when used repeatedly.

Smart User Tip:
Be cautious with marketing claims in the wellness and neurofeedback space. Before buying, check whether the product's promised benefits are supported by peer-reviewed scientific research, or whether they rely mainly on testimonials and promotional language. It is important to note that most of these tools are sold as consumer electronics, and not medical devices. As a result, they often operate outside the stricter data protection rules that apply to clinical records, such as the GDPR (General Data Protection Regulation) in Europe, PHIPA (Personal Health Information Protection Act) in Canada, or HIPAA (Health Insurance Portability and Accountability Act) in the USA.

Also be wary when these devices are marketed as solutions for health, mental health, and neurodivergence. The research behind such claims is in incipient stages, usually not as promising or evidence-based as marketed. Most importantly, in order to operate on health conditions, they should be certified as medical, not wellness, devices.

5. Gaming and VR

Neurotechnology added to gaming and VR can adapt difficulty or pacing in real time based on patterns linked to attention, arousal, or stress, helping players stay engaged. To personalize the experience, games may collect neural signals and behavioral data to infer how a player typically responds to certain stimuli. This is highly personal data.

Smart User Tip:
Check if the game allows you to play *without* the data collection features enabled when you just want a casual session.

Note to you. This brochure is aimed at educating you about the informed usage of commercially available neurotechnologies. It does not cover the medical and healthcare sector where neurotechnology is most established to diagnose, monitor, and treat neurological and mental health conditions. These applications are typically used under medical supervision, supported by scientific evidence, and subject to strict safety and ethical standards. However, even then, make sure to ask how your brain data will be collected, stored, and protected. Make sure the use is medically justified, evidence-based, and explained in clear terms, and that you can withdraw consent without affecting your care. In healthcare, neurotechnology should always prioritize patient well-being, safety, dignity, and autonomy over innovation or efficiency alone.

The Mental Privacy Checklist

Before you buy or use neurotechnology, you may check the Terms of Service, Privacy Policy, and End User License Agreement. As a consumer, you have the right to demand transparency and mental privacy.

- **Privacy by Design & Local Storage:** Ensure your data are processed and stored locally on your device whenever possible. The policy should explicitly mention “Local Processing” and “Right to Erasure.”
  Pay attention to: The policy is vague about where data are stored or states that data are uploaded to the cloud by default for “processing.”

- **Truly Voluntary Consent:** You must be able to opt in freely and withdraw consent at any time without being penalized or losing access to the device’s basic functions.
  Pay attention to: Consent is “bundled” into a single “I Accept” button, or you are told that refusing data sharing will disable the product.

- **Data Rights & Access:** You should retain ownership of your raw neurodata and have the right to access any “processed” reports or predictions made about you.
  Pay attention to: The company claims a “worldwide, royalty-free, perpetual license” to use your neurodata however they wish.

- **Strict Purpose Limitation:** The company must clearly explain why your data are collected and commit to using it only for that specific service.
  Pay attention to: Phrases like “to improve our services,” “for algorithm training”, or “internal research” are used without a separate opt-in.

- **No Third-Party Sharing:** Your personal neurodata should not be shared with outside parties for marketing or profiling.
  Pay attention to: References to sharing data with “trusted partners”, “affiliates”, or “third-party service providers” without naming them or their specific role.

- **Biometric Sensitivity:** Even if data are labeled “anonymized” it must be treated as a sensitive fingerprint. The company should have a “No Re-identification” policy.
  Pay attention to: The provider states they have the right to sell or share “de-identified” or “aggregated” neurodata without your additional consent.

- **Transparency on Inferences:** You have the right to know what the company is “predicting” about you (e.g., your mood or health) and to challenge automated decisions.
  Pay attention to: The policy doesn't disclose that it profiles your personality or mental state or offers no way to see your “consumer score.”

- **Breach Accountability:** The provider must commit to notifying you promptly if your neurodata are ever lost, breached, or accessed without authorization.
  Pay attention to: No mention of a security breach protocol or a lack of contact information for a Data Protection Officer.

- **Freedom from Coercion:** The use of the technology must be optional. It should never be required for a performance evaluation or to avoid penalties.
  Pay attention to: The device is presented as “mandatory for safety” or “required for participation” in a workplace or classroom setting.

Special Protections for Children

- **Developmental Integrity:** Neurotechnology for children should be used only for therapeutic or assistive purposes, such as supporting neurodivergent students or addressing specific learning disabilities - never for performance enhancement in healthy children.
  Pay attention to: Marketing that promises to “boost IQ”, “optimize performance” or “enhance focus” in healthy children through neural stimulation or training.

- **Double-Lock Consent (Parental + Child):** A parent's signature is not a blank check. Two layers of permission are required:
  1. **Verified Parental Consent** - Parents must give explicit, informed consent before any data collection begins.
  2. **Child Assent** - The child must voluntarily agree to use the device. Children should be asked multiple times throughout use - not just once at the start - whether they still want to participate.

  Pay attention to: Bundled consent forms that hide data-sharing rules in fine print, or systems that don't check in with the child regularly.

- **Ban on Neuromarketing to Children:** A child's brain patterns must never be used for marketing, advertising research, or commercial profiling.
  Pay attention to: Apps or games that collect neurodata while showing ads, or research studies that use children's brain responses to test product appeal without clear disclosure.

- **The Zero-Profiling Guarantee:** A child's neurodata must be treated as temporary and deleted after its immediate purpose is fulfilled. It should never create a permanent record - whether in schools, apps, games, or wellness programs.
  Pay attention to: The company or school creates a “neural CV”, “brain-based learning profile”, or permanent record that could follow a student into higher education, affect college admissions, or influence future employment opportunities.

The Golden Rules

If the service is free, your brain data are likely the product. As a consumer, you have the right to demand:

Transparency: Companies must disclose not just what they collect, but what they infer or predict about your health or personality or other mental states.

Physical & Mental Safety: No device should ever influence your mood, thoughts, or decisions without your knowledge and consent. If a technology subtly nudges your behavior or alters your emotions behind the scenes, it is no longer just a tool; it is an intrusion.

Data Portability: Your neural profile belongs to you. You should be able to take your data with you if you leave the service.

Mind Your Mind

Neurotechnology is no longer a distant promise; it is already here. We, as a society, are beginning to see how it may shape how we work, how we treat illness, and how we understand and support the human mind. Like the internet, social media, or AI, neurotechnologies are tools whose impact depends on how they are designed, used, and governed. As a user, you can decide whether to adopt these technologies, how to use them, and what privacy terms you accept - but individual choices alone are not enough to shape how these technologies develop.

Neurotechnologies touch directly on our minds, bodies, and identities; that makes their development and deployment a matter of public concern. Shaping appropriate governance requires active engagement from society at large, not just from one user at a time. Being vocal about what safeguards are necessary and what risks are unacceptable is a collective responsibility. Whether they empower people or quietly reshape privacy and control is a choice we are making now.

We believe you deserve “Privacy by Design”. As neurotechnologies evolve, the risks are real: data breaches that expose intimate brain information, unprecedented profiling of behavior, loss of control over how neurodata are used, and the erosion of our privacy of thought. As a user and consumer, your choices matter. By supporting companies that prioritize transparency, human rights, and strong neurodata protection, you help set the standards for how mental safety is treated.

Acknowledgements

This guide is an initiative of the EBRAINS Ethics and Society Committee (EESC), in collaboration with the International Brain Initiative (IBI) and in the spirit of the Brain Awareness Week 2026. It was created to empower the public with knowledge about neurodata: what they are, why they matter, and how they can and should be protected. It is aligned with the principles of the European Charter for the Responsible Development of Neurotechnologies, which calls for ethical innovation, a human rights-based approach, and robust safeguards for neurodata.

The authors thank Marianne Bacani, International Brain Initiative, and Evan Hancock, EBRAINS, for producing the material, and Alexander Tudose, Laboratory of Cognitive Clinical Sciences, University of Bucharest, for input on the initial draft.

Additional Resources

Coates McCall, I., Lau, C., Minielly, N., & Illes, J. (2019). Owning ethical innovation: Claims about commercial brain wearable technologies. Neuron, 102, 728–731.

United Nations Educational, Scientific and Cultural Organization. (2025). Draft Recommendation on the Ethics of Neurotechnology. https://unesdoc.unesco.org/ark:/48223/pf0000394866

UNICEF Innocenti (2025), Neurotechnology and Children's Rights. https://www.unicef.org/innocenti/media/11426/file/UNICEF-Innocenti-Neurotech-Childrens-rights-Report-2025.pdf

OECD. (2019). Recommendation of the Council on Responsible Innovation in Neurotechnology. https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0457

Chile. (2021). Constitution (Amendment to Article 19). Law No 21 383.

Neurorights Foundation. (2024). Safeguarding Brain Data: Assessing the Privacy Practices of Consumer Neurotechnology Companies. https://perseus-strategies.com/wp-content/uploads/FINAL_Consumer_Neurotechnology_Report_Neurorights_Foundation_April-1.pdf

European Brain Council. (2025). European Charter for the Responsible Development of Neurotechnologies. https://www.braincouncil.eu/european-charter-for-the-responsible-development-of-neurotechnologies/

Internet of Brains. (2025). NeuroTech Guidebook. https://brains.link/en/braintech_guidebook

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BRAIN AWARENESS WEEK Dana Foundation

Developed by the EBRAINS Ethics and Society Committee, in collaboration with the International Brain Initiative, on the occasion of Brain Awareness Week 2026.