COUNCIL OF EUROPE

CONSEIL DE L'EUROPE

Strasbourg, 21 octobre 2025

STEERING COMMITTEE FOR HUMAN RIGHTS IN THE FIELDS OF BIOMEDICINE AND HEALTH (CDBIO)

WORKSHOP ON HUMAN RIGHTS AND NEUROTECHNOLOGIES

18 NOVEMBER 2025

ROOM 3, PALAIS DE L'EUROPE, STRASBOURG

GENERAL BRIEFING

1. The field of neurotechnology

Neurotechnology (NT) is a rapidly evolving field of development at the intersection of multiple scientific disciplines, including neuroscience, medicine, (bio)engineering, computing, and materials science. NT broadly refers to methods, technologies, and devices to record, monitor, assess, stimulate and/or manipulate the structure and function of the human neural system. Or, in short, it encompasses technologies that establish a direct connection to the human brain and broader nervous system.

Three prominent categories of technologies can be distinguished. While these overlap and are increasingly combined and integrated, each serves their own functional purpose:

i. Neuroimaging Technologies to access and record brain structure and functioning.
- *E.g. Electroencephalogram (EEG) – A method to measure the electrical activity in the brain to provide information on its functioning;*
- *E.g. Magnetic Resonance Imaging (MRI) – A method deploying magnetic fields to generate detailed pictures of the structure of the brain (MRI), or yield information on brain activity (fMRI);*

ii. Neurostimulation Technologies to stimulate, alter or modify brain functioning.
- *E.g. Deep Brain Stimulation (DBS) – An implantable stimulation technique that involves the placement of electrodes directly in the brain;*
- *E.g. transcranial Direct Current Stimulation (tDCS) – A wearable stimulating technique that stimulates the brain through electrodes applied to externally, to the skull;*

iii. Brain-computer interfaces Technologies to establishing an operational connection between the brain and external electronic devices.
- *E.g. BCI-controlled robotic limbs, wheelchairs, drones, or computers;*

The vast majority of NT development is currently driven by the pursuit of medical breakthroughs. While still in an early stage, NT is reshaping the diagnosis, treatment, and rehabilitation of individuals with neurological and neuropsychiatric conditions such as Parkinson's disease, dystonia, epilepsy, paraplegia, major depression disorder, and obsessive-compulsive disorder. Nonetheless, NT's potential beyond clinical applications is widely recognised. NT is increasingly explored – and in some cases already commercialised – in a range of non-medical domains. In the realm of lifestyle and well-being, for instance, neuroimaging-based brain monitors are marketed to enhance focus, reduce stress and fatigue, and improve meditation quality. In gaming, BCIs are developed that enable players to control virtual characters using neural signals. In education, neuroimaging is studied as a tool to monitor and enhance students' attention and cognitive engagement. Similarly, in the workplace settings, neuroimaging is used to improve workers' safety by tracking fatigue or workload, and neurostimulation is employed to increase workers productivity by augmenting focus. Meanwhile, the defence and security sector is experimenting with neurobiometric identification, BCI-controlled drones, and neurostimulation-based soldier enhancement. Lastly, in criminal justice, applications such as neuroimaging-based lie detection and memory probing are being explored.

2. Ethical concerns

NT is poised to become increasingly pervasive across diverse societal sectors, raising significant ethical and human rights concerns throughout its entire lifecycle – from design and development to marketing, use, monitoring, and withdrawal and dismantling. Many of these concerns mirror those associated with other emerging biotechnologies, including the protection of bodily integrity and safety, personal autonomy, privacy, inclusion, and equitable access. These issues are particularly acute given the brain's complexity, vulnerability, and centrality to the human experience. These issues, however, lie beyond the core focus of this workshop and may warrant separate consideration.

NT also raises specific challenges due to its direct interaction with the brain – the organ most closely linked to individuals' mental states and processes. This close link provides NT with the ability to interfere in a novel way with individual's mental states and processes, giving rise to particular ethical concerns which will be at the core of the workshop:

Integrity*, including mental integrity*
(*The state of being free from mental harm)*

Each stage of the NT lifecycle – from design and development, to use and withdrawal – carries risks to individuals' physical and mental health and overall well-being. While physical harm is a known concern in biotechnology, NT demands particular attention to mental integrity. During research and development, experimental or insufficiently tested applications may cause unforeseen neurological or psychological side effects, often overlooked in trials focused on physical outcomes. In the deployment phase, these risks may intensify due to misuse, inadequate safeguards, unintended and unforeseen effects, or malicious exploitation, potentially leading to (serious) mental harm**.**

Autonomy*, including mental autonomy*
(*The ability of individuals to exert control over their own mental states, processes, and abilities)*

NTs, capable of influencing mental states and processes by interfacing with the brain, raise significant concerns about mental autonomy. Neurostimulation can modulate cognitive, affective, and conative processes, influencing beliefs, emotions, intentions, and ultimately behaviour. Its (mis)use can generate far-reaching implications for mental autonomy, as well as interconnected fundamental human aspects, such as personal identity, agency, authenticity, sense of self, and freedom of thought.

Privacy, *including mental privacy*
(The ability of individuals to control which mental information they chose to disclose to others)

The development and use of NTs rely collecting, processing, storing, and sharing large volumes of neural data (i.e., data on brain structure and function) generated through neuroimaging. These data are highly informationally rich, enabling increasingly accurate AI-driven inferences about an individual's health status, identity, cognitive capacity, and even sexual orientation. Critically, neural data can also be decoded to reveal mental states and processes, including thoughts, emotions, memories, and intentions. Neural data can thus be processed and interpreted to produce mental information. In BCI applications, such inferences enable direct control of external devices through mental activity alone. The value of neural data and mental information spans public interest domains – health, justice, security – but also raises the risk of exploitative uses, including manipulation and discrimination. As NTs evolve into tools for invasive mental monitoring, serious concerns emerge about mental privacy and the harmful secondary uses of neural data.

3. The search for human rights safeguards

The increasing realisation of these threats to individuals' inner mental sphere gave rise to the question: how does the European human rights framework offer protection to the privacy, autonomy, and integrity of people's mental states and processes? Considering the central role

of mental states and processes in the human experience and the ability to flourish as an autonomous human being within society, human dignity demands a robust and effective protection of these fundamental interests in the context of neurotechnological innovation.

While the abilities of NT were not anticipated at the time of their drafting, the European Convention on Human Rights (ECHR) and the Convention on Human Rights and Biomedicine (Oviedo Convention) may nonetheless offer protection. This holds especially true when these instruments are understood as living instruments, open to evolutive interpretation. It seems that certain fundamental elements of these frameworks could be invoked in cases where the (mis)use of NT infringes on (mental) privacy, autonomy, or integrity. In particular, the right to freedom of thought, conscience, and religion (Article 9 ECHR) explicitly protects the *forum internum* (an individual's inner sphere of thoughts and convictions). This right protects not only the outward expression of religious or conscientious beliefs, but also unexpressed thoughts and beliefs in the *forum internum*. Could this provision serve as a meaningful human rights safeguard in an era of expanding neurotechnological capabilities for mental interference? The absolute protection offered to the *forum internum* may be relevant both for technologies that extract mental information from the brain by collecting and processing neural data, and for those that influence mental processes by modifying brain activity. The right to freedom of thought namely protects against both the unwanted exposure of thoughts and the undue influencing of thoughts, thereby seemingly safeguarding – aspects of – (mental) privacy and autonomy. Could these protections meaningfully apply to neuroimaging-based interventions that access brain data and mental information, as well as neurostimulation-based interventions that alter brain activity and influence mental states and processes?

Additionally, the right to private life (Article 8 ECHR) encompasses a range of fundamental, qualified protections – including the rights to privacy, bodily and psychological/mental/moral integrity, personal autonomy, and personal identity – several of which are also reflected in Articles 1 and 5 of the Oviedo Convention. Do these protections address the challenges posed by technologies that could access and influence the human mental sphere through interference with the brain? And how does their qualified protection relate to the absolute protection of the freedom of thought? Furthermore, what role may the rights to benefit from scientific progress (Article 27 Universal Declaration on Human Rights; Article 15 International Covenant of Economic, Social, and Cultural Rights), and to right health (Article 11 European Social Charter, Article 12 ICESCR; Article 22 Convention on the Rights of Persons with a Disability) play in a context of expanding proliferation of neurotechnology throughout different fields of society?

For a robust and effective human rights framework to emerge that protects individuals' mental states and processes from neurotechnological intrusion, substantial interpretative work is needed. Said work should both clarify the scope and meaning of existing protections of the *forum internum* and identify potential avenues for future interpretation.

4. The workshop

Objective

This workshop aims to focus on the former interpretative task. It will explore whether and how human rights law in its current form can serve as an effective legal framework to address the challenges arising from the increasing use and development of neurotechnologies.

Structure

The workshop will consist of four sessions. The first session will provide a general overview of neurotechnology, and present a brief introduction into its most pressing ethical and human rights concerns.

The second and third sessions will offer a deep dive into the current state of European human rights law and its interpretation in relation to neurotechnology. It will examine relevant human rights in terms of their protective capacity pertaining to individuals' mental sphere, based on

an analysis of concepts such as mental privacy, self-determination, and personal identity as they may occur (implicitly) in case law and human rights discourse. These two sessions are clearly distinct in topical focus, based on the different functional nature of neurotechnological interventions: respectively the extraction of data from the brain and the alteration of brain activity. The second session analyses how human rights safeguards may apply to neurotechnologies that extract data from the brain and allow for mental information to be generated. It explores the extent to which privacy interests are protected when such data are collected and processed, and whether existing human rights framework can address discrimination based on such data. The third session examines the human rights protections offered in the context of neurotechnologies that modify the brain, and by doing so may influence mental processes. It will focus on the human rights safeguards for autonomy, integrity and self-determination in a context of direct interference with bran processes.

Finally, the fourth session will conclude the workshop by outlining key cross-cutting insights and highlighting potential future directions for human rights interpretation in the context of neurotechnology.

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Neurotechnology and human rights – Session I

INTRODUCTORY SESSION
9.00 – 10.00

This briefing note serves as a topical guide for the speakers and moderators of the session. It outlines key issues for consideration during the discussion. The indicated questions and topics are suggestions and are by no means intended to limit the speakers' freedom to determine the scope of their analysis or their approach to the subject.

Moderators **Roberto Andorno,** *Professor Bioethics and Medical Law, University of Zürich*
Anne Forus, *Chair of the CDBIO neurotechnologies group*

Speakers **Luuk Ex,** *Rathenau Instituut*
Anna Austin, *Jurist Consult of the European Court of Human Rights*

Goal This first session aims to familiarise workshop participants with the subject matter. As legal practitioners may be less acquainted with this emerging field of NT, the session aims to provide a general overview of the following key issues:

1. The technology – What is neurotechnology, and what are the most significant current and anticipated interventions enabled by its different applications?
2. The ethical and human rights concerns – What are the most pressing ethical and human rights concerns that arise in the wake of the rapid development and growing proliferation of neurotechnologies?

Structure The session will open with a brief, general introduction by the CDBIO chair. Subsequently, it will feature an introduction of the session by the moderator, followed by presentations of two speakers, each allotted 15 minutes. The session concludes with a 20-minute window for interactive discussion.

9.00 – 9.05	9.05 – 9.10	9.10 – 9.30	9.30 – 9.50	9.50 – 10.00
Welcome by CDBIO Chair	**Introduction by moderators**	**Presentation 1**	**Presentation 2**	**Possibility for questions**
Tomáš Doležal	*Roberto Andorno & Anne Forus*	*Luuk Ex*	*Anna Austin*	*Including audience questions*

Substantive indicators To ensure participants are well-prepared for the legal analysis of neurotechnology's human rights impact later in the workshop, the presentation could cover – but should not be limited to – the following elements:

WELCOME & INTRODUCTION *(9.00 – 9.10)*

- Welcome and general introduction by CDBIO Chair;
- Introduction by moderators which includes (i) a brief personal introduction, (ii) an outline of the goal and scope of the session, and (iii) an introduction of the speakers.

LUUK EX, *RATHENAU INSTITUUT: THE TECHNOLOGY (9.10 – 9.30)*

- A general outline of the main categories of neurotechnologies, including neuroimaging, neurostimulation and brain-computer interfaces;
- A general outline of the distinct ways in which neurotechnologies interfere with the brain;

- An explanation of the way in which these technologies interfere with and affect mental states and processes (and the way in which they do not);
- An indication of the current stage of development, highlighting both capabilities and limitations;
- A general exploration of the current applications both in the medical field and beyond, e.g. for purposes such as enhancement in lifestyle, workplace or education contexts, and for purposes of leisure, entertainment, security and defence, or criminal justice;
- An outlook on the expected future trajectory of neurotechnology development and proliferation, including potential challenges to its widespread use;
- A general overview of the ethical concerns posed by neurotechnologies across all stages of their lifecycle.

***ANNA AUSTIN**: HUMAN RIGHTS CONCERNS (9.30 – 9.50)*

- A focused outline of the ethical risks from the (mis)use of neurotechnologies to interfere with people's mental states and processes (e.g., privacy (including mental privacy), integrity (including mental integrity), autonomy (including mental autonomy), personal identity, freedom of thought, non-discrimination, and justice);
- A brief introduction to the European human rights framework, highlighting the most relevant areas in addressing challenges posed by technologies that can access or influence brain and mental states – such as the freedom of thought, conscience and religion, the freedom of opinion, and the right to private life, the right to benefit from scientific progress, and the right to health;
- An indication of how the ethical concerns can be translated into human rights discourse. This could involve a brief exploration of how notions such as privacy (including mental privacy), integrity (including mental integrity), autonomy (including mental autonomy), personal identity, freedom of thought, non-discrimination either appear explicitly in the case law, or can be linked to other notions or principles established in the case law.

FOLLOW-UP QUESTIONS (Moderator)

- In your view, what is the most pressing short-term human rights concern regarding the proliferation of neurotechnologies across different sectors of society?
- Does neurotechnology warrant special attention in the human rights context, and if so, in what way? How should this be balanced against the critique of "neurohype," which argues that its societal impact may be overstated and comparable to that of other emerging technologies?
- It is often argued that legal and human rights concerns in the medical context are less pressing given the high degree of regulation. Do you agree with this view? And would it therefore be justified to focus primarily on the human rights impact of neurotechnologies beyond medicine?

Neurotechnology and human rights – Session II

PRIVACY AT RISK – Neurotech applications accessing the brain and mental states

10.00 –10.45 / 11.15 – 12.00

This briefing note serves as a topical guide for the speakers and moderators of the session. It outlines key issues for consideration during the discussion. The indicated questions and issues are suggestions and are by no means intended to limit the speakers' freedom to determine the scope of their analysis or their approach to the subject.

Moderators **Damaris Carnal**, *Vice-Chair of the CDBIO*
Mark Bale, *member of the CDBIO neurotechnologies group*

Panellists **Martina Malcheva,** *Senior Legal Expert at the Constitutional Court of the Republic of Bulgaria*
Marius Emberland, *Professor Public and international law at BI Norwegian Business School*
Respondent: Armen Harutyunyan, *former judge of the ECtHR*

Goal This session aims to assess whether the existing European human rights framework offers adequate protection against the challenges posed by neurotechnologies' growing ability to access neural data and mental information. The key question is:

> Do existing human rights offer sufficient protection against the (mis)uses of neurotechnology that interfere with individuals' privacy interests, particularly related to their mental states, processes and abilities?

Structure The session will be divided into two parts, separated by a coffee break. Each part will open with a 15-minute presentation (using up max. 3 PowerPoint slides), followed by a 10-minute response from the primary respondent and a 15-minute interactive panel discussion.

<table>
<tr><th>10.00 – 10.05</th><th>10.05 – 10.45</th><th>10.45 – 11.15</th><th>11.15 – 11.55</th><th>11.55 – 12.00</th></tr>
<tr><td rowspan="3">Introduction by moderators

Damaris Carnal + Mark Bale</td><td>10.05 – 10.20
Presentation
Martina Malcheva</td><td rowspan="3">COFFEE BREAK</td><td>11.15 – 11.30
Presentation
Marius Emberland</td><td rowspan="3">Fire round

Martina Malcheva & Marius Emberland</td></tr>
<tr><td>10.20 – 10.30
Response
Armen Harutyunyan</td><td>11.30 – 11.40
Response
Armen Harutyunyan</td></tr>
<tr><td>10.30 – 10.45
Panel discussion

All panellists & audience questions</td><td>11.40 – 11.55 Panel discussion

All panellists & audience questions</td></tr>
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General background Advancements in neurotechnology and AI increasingly enable the extraction of ever more precise and diverse forms of mental information through the collection, processing and interpretation of neural data. Neuroimaging techniques now provide richer insights into brain structure and function, and when combined with sophisticated AI algorithms, not only allow for the inferring information on health status and identity, but also mental states, traits, and abilities. NTs constitute a novel, unique tool to access individuals' cognitive functions, emotions, thoughts, intentions, visual perceptions, dreams, and memories – without requiring verbal expression. This capacity turns NTs into powerful instruments for mental monitoring and surveillance, raising serious concerns about (mental) privacy – the ability for an individual to exert control over what mental information the person choses to disclose to the world. This prompts a critical question: Does existing human rights law adequately protect against unwanted intrusions into our mental sphere and the extraction of potentially sensitive, undisclosed information? Does the right to private life (Article 8 ECHR) offer satisfactory protections to the collection and processing of neural data? And is the freedom of thought (Article 9 ECHR), which is considered to prohibit the 'unsolicited exposure of thoughts', a valuable tool to protect peoples' (mental) privacy against unjustifiable forms of interference through neurotechnology?

Moreover, as neurotechnology enables new forms of monitoring individuals' mental states – along with other highly personal and sensitive aspects of their lives – concerns arise about its potential for discriminatory use. Enhanced profiling techniques may emerge, allowing individuals to be evaluated and categorised based on their cognitive abilities, emotional responses, beliefs, or opinions –without their knowledge or consent, fully disregarding their ability for introspection and self-regulation. When would such practices cross the line into discrimination, and should human rights law explicitly address profiling based on different mental information (e.g., through Article 14 ECHR)?

Hypothetical cases

1. *Criminal justice context*
   A suspect is interrogated in connection with an armed robbery, with his knowledge of the getaway car being critical to the investigation. However, he remains entirely uncooperative. As a result, law enforcement turns to neuroimaging technologies capable of accessing the suspect's memories. The collection of his neural data in a specifically designed interrogation context allows them to directly probe for his memory of the colour of the car without requiring verbal responses. While this approach raises concerns under the right to a fair trial (Article 6 ECHR), particularly the right to remain silent, it may also implicate other fundamental rights. Specifically, does this form of evidence gathering – based on the extraction and processing of neural data – constitute a violation by the state of the right to privacy (Article 8 ECHR), the right to bodily and mental integrity (Article 8 ECHR), or the freedom of thought (Article 9 ECHR)?

2. *Employment context*
   Company Y – a marketing firm specialising in political campaigns – requires job applicants to undergo comprehensive brain assessments. Through neuroimaging, the company seeks to evaluate candidates' cognitive abilities by examining the structure and functioning of their brains. However, given that the role also demands creativity and involves close interaction with political parties, the HR manager further analyses the neural data – without the applicants' knowledge I – to infer their creative potential and political preferences. How does the right to privacy (Article 8 ECHR) and the freedom of thought (Article 9 ECHR) apply to this use of neural data?

Substantive indicators In light of the workshop's objectives and overall structure, the following questions could guide the presentation by the speakers, and be instructive for the following panel discussion:

INTRODUCTION BY MODERATORS *(10.00 – 10.05)*

The moderators should briefly present the aim and scope of the session. This includes briefly outlining the scope and meaning of the key concepts and rights that will be of central focus. Subsequently, they should introduce the panellists.

SESSION *(10.05 – 10.45)*

MARTINA MALCHEVA*: How do the privacy safeguards of Article 8 ECHR apply to NT-based surveillance and the collection, processing, sharing and disclosing of neural data and mental information? (15 minutes)*

In this presentation, the speaker is invited to provide an overview of whether and how Article 8 ECHR, as interpreted by the ECtHR, applies to emerging issues in NT. The focus is twofold: (1) the use of NT for (mental) surveillance, and (2) the collection and processing of neural data. While these aspects are closely linked, the first probes for whether, to what extent, and under which conditions (State) actors may employ NTs to obtain information about individuals. The second rather addresses potential data protection safeguards emanating from article 8 ECHR that may apply to the collection and processing of neural data.

A key issue to be considered is the impact of the fact that NT surveillance and data processing may concern the individual's mental states (thoughts, emotions, intentions, decision-making, etc.). The presentation should address whether existing case law suggests that Article 8 ECHR protects the *forum internum*, whether there are there any useful, established principles that can be directly or analogously applied to the collection of neural data and mental information, and whether there are indicators guiding the proportionality assessment in such cases. If case law is absent or inconclusive, this should also be explicitly noted.

ARMEN HARUTYUNYAN: response (10 minutes)

FOLLOW-UP QUESTIONS FOR ALL PANELLISTS (Moderator)

- Examining the case law of the ECtHR, is there any reason to take the position that mental privacy would not fall into the scope of Article 8 ECHR?
- Does the fact that NT could generate data that is translatable into information peoples mental sphere, and that privacy interests thus may relate to the *forum internum,* affect the proportionality assessment under article 8 ECHR in any way? Put differently: Is the threshold for proportional and legitimate interferences heightened because the privacy interests at stake relate to unexpressed mental states? Is there any case law indicating such a thing?
- Are there gaps in this protection, and where do these gaps stem from (e.g., Unclarity in scope? Unclarity in meaning? Overly limited scope? Discrepancy between meaning/purpose of these rights and the context of mental privacy as threatened by neurotechnology)?
- Taking account of the ECtHR case law, could the proportionality test under Article 8 ECHR ever justify a general prohibition on the collection of neural data—such as that of children—given its profound privacy implications?

SESSION *(11.15 – 12.00)*

MARIUS EMBERLAND: *(How) does the right to freedom of thought (Article 9 ECHR) aim to protect the privacy of thoughts in a context of information and data gathering by NTs? (15 minutes)*

In this presentation, the speaker is invited to shed a light on the privacy protection afforded by Article 9 ECHR. To frame the discussion, it would be helpful to first briefly reiterate the relevant elements (in terms of meaning, structure and scope) of the right to freedom of thought.

Legal doctrine often asserts that the right to freedom of thought includes a right not to be compelled to reveal one's thoughts. This has been interpreted as a strong – because absolute – protection of privacy of the *forum internum*. The speaker could address the question as to whether this strong form of privacy protection is reflected in the case law of the ECtHR – or, if relevant, the preparatory works of the ECHR – relating to Article 9 ECHR, and whether the right to freedom of thought is in practice understood as a safeguard for privacy.

If so, how might such a safeguard apply to the collection of neural data used to infer individuals' mental states—potentially against their will or without their knowledge?

ARMEN HARUTYUNYAN: response (10 minutes)

FOLLOW-UP QUESTIONS FOR ALL PANELLISTS (Moderator)

- Is it consistent with the broader framework of privacy and autonomy rights in human rights law to interpret Article 9 ECHR as conferring an absolute right to privacy? Does the special significance of the *forum internum* – the protection of unexpressed thoughts – justify a departure from the traditional understanding of privacy and autonomy rights as relative, subject to balancing against competing interests?
- Is the conception of the right to freedom of thought as an absolute protection to the *forum internum* justified on the basis of ECtHR case law? This absolute character appears to be generally accepted, and has recently been aptly described as 'uncontroversial yet untested'. What are your views on this?
- When examining the ECtHR case law, are there any useful indications of what constitutes 'thought' and whether it would include 'thinking'.? What are 'thoughts' in the sense of Article 9 ECHR? And would it include 'thinking'?
- Is there any relevant case law that may elucidate the interplay between the respective relative and protection offered by Article 8 and Article 9 ECHR?
- Are there gaps in this protection, and where do these gaps stem from (e.g., Unclarity in scope? Unclarity in meaning? Overly limited scope? Discrepancy between meaning/purpose of these rights and the context of mental privacy as threatened by neurotechnology)?

FIRE-ROUND QUESTION (FOR THE 2 PRESENTERS, MAX. 2 MINUTES EACH)

How should human rights protections be strengthened to address actual or potential gaps? Should we focus on improving existing frameworks through interpretation, or explore entirely new approaches?

Neurotechnology and human rights – Session III

SELF-DETERMINATION, FREEDOM OF THOUGHT AND INTEGRITY AT RISK – Neurotech applications altering the brain and mental states

12.00 –13.00 / 14.30 – 16.00

This briefing note serves as a topical guide for the speakers and moderators of the session. It outlines key issues for consideration during the discussion. The suggested questions and issues are suggestions and are by no means intended to limit the speakers' freedom to determine the scope of their analysis or their approach to the subject.

Moderators **Timo Istace,** *Postdoctoral researcher at the University of Antwerp, Belgium*
Laura Palazzani, *professor of philosophy of law, LUMSA University, Rome, Italy*

Speakers **Vassilis Tzevelekos,** *Member of the UN Human Rights Council Advisory Committee*
Monika Hermanns, *Former Justice German Federal Constitutional Court*
Federico de Montalvo, *Professor at the University Pontificia Comillas, Spain*
Respondent: Paulo Sergio Pinto de Albuquerque, *Professor (*Catedrático*) of the Católica School of Law, Lisbon, former ECtHR judge, Portugal*

Goal This session will examine how European human rights law protects individual's self-determination, sense of self, agency, freedom of thought, and integrity against (mis)uses of neurotechnology that threaten these fundamental values by modifying brain and mental activity. Key questions to be addressed include:

1. Does human rights law offer adequate protection against the (mis)uses of neurotechnology that interfere with individuals' mental states, processes and abilities in a way that undermines their freedom of thought, (mental) autonomy, sense of self, agency and authentic personality formation?
2. Does human rights law offer adequate protection against (mis)uses of neurotechnology that (may) undermine mental integrity by causing psychological harm?

Structure The session will be divided into two parts, separated by a lunch break. The first part will be opened by a brief introduction to the entire session by the moderators, subsequently followed by a 15-minute presentation (using up max. 3 PowerPoint slides), a 10-minute response from the primary respondent and a 25-minute interactive panel discussion.

The second part, similarly, will feature two times the same pattern of 15-minute presentation (using up *max. 3 PowerPoint slides*), a 10-minute response from the primary respondent and a 15-minute interactive panel discussion. The session will be concluded by a 10-minture Fire round question.

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<tr><th>12.00 – 12.10</th><th>12.10 – 13.00</th><th>13.00 – 14.30</th><th>14.30 – 15.50</th><th>15.50 – 16.00</th></tr>
<tr>
<td rowspan="5">Switching panels

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Introduction by moderators

Timo Istace & Laura Palazzani</td>
<td rowspan="2">12.10 – 12.25
Presentation
Vassilis Tzevelekos</td>
<td rowspan="5">L U N C H B R E A K</td>
<td>14.30 – 14.45
Presentation
Monika Hermanns</td>
<td rowspan="5">Fire round

Vassilis Tzevelekos

Monika Hermanns

Federico de Montalvo</td>
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<tr>
<td>14.45 – 14.55
Response
Paulo Sergio Pinto de Albuquerque</td>
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<td rowspan="2">12.25 – 12.35
Response
Armen Harutyunyan</td>
<td>14.55 – 15.10
Panel discussion
All panellists & audience questions</td>
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<tr>
<td>15.10 – 15.25
Presentation
Federico de Montalvo</td>
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<td>12.35 – 13.00
Panel discussion
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<td>15.25 – 15.35
Response
Paulo Sergio Pinto de Albuquerque</td>
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<tr>
<td>15.35 – 15.50
Panel discussion
All panellists & audience questions</td>
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General background The capacity of NTs to influence, alter, or manipulate the functioning of the brain has raised significant ethical and human rights concerns. These concerns have become particularly salient in light of studies showing that neurostimulation techniques – by directly interfering with brain activity – can, whether intentionally or not, affect cognitive, emotional, and volitional functions. Clinical trials involving individuals with Parkinson's disease have shown that deep brain stimulation (DBS) may alter key aspects of personal identity, with side effects such as mania, hypersexuality, compulsive gambling, and impulsive behaviour. These unintended changes raise questions about autonomy, agency, and authentic personality formation. Beyond such side effects, neurostimulation is actively researched and used precisely because of its ability to modulate cognitive and affective processes. For example, transcranial magnetic stimulation (TMS) is deployed as a treatment for major depression disorder. Other forms of neurostimulation are being explored – and in some cases clinically applied – for conditions such as schizophrenia, obsessive-compulsive disorder, anorexia nervosa, anxiety disorders, and addiction. The ability to interfere with mental states and influence behaviour has also attracted interest outside the clinical context. Consumer neurotechnology is already on the market, with devices such as transcranial direct

current stimulation (tDCS) headsets promising to reduce stress, enhance productivity, boost alertness, or support meditation and relaxation.

This has raised a number of pressing questions: How do different neurostimulation devices affect an individual's sense of self and personal identity? Can individuals still be regarded as fully autonomous decision-makers when their brain activity is influenced by external stimulation? What minimum level of information must be provided for the right to integrity to be genuinely respected? If uncertainty - or even unawareness - about potential mental effects is too great, a person's consent may not truly protect their personal integrity, even if those uncertainties are disclosed. In this light, can free and informed consent really serve as a reliable safeguard for integrity and, ultimately, dignity in the context of cutting-edge technologies? And how can (mental) health and well-being be protected when longitudinal studies on the potential short- and long-term harms of neurostimulation are still lacking? These concerns are increasingly being addressed through a human rights lens. The growing vulnerability of mental states and processes to unwanted or harmful interference by neurotechnologies raises a fundamental question: Does existing human rights law provide adequate safeguards for the autonomy and integrity of mental processes – ultimately protecting individuals' freedom of thought, self-determination, sense of identity, and mental well-being? Particular attention is directed towards the freedom of thought (Article 9 ECHR), which in its internal dimension holds an absolute prohibition of 'impermissible alteration of thought'. Does this protection extend to interference with mental states and processes by NTs? Furthermore, (how) is this protection complemented by safeguards such as the right to personal integrity (including both bodily and mental integrity) as part of Article 8 ECHR?

Hypothetical cases

1. *Criminal justice context*

In the context of a rehabilitation programme, a detainee is offered the possibility of early release on the condition that they consent to the use of a neurostimulation device designed to reduce aggressive behaviour and control sexual impulses – ultimately aiming to lower the risk of recidivism. Given the inherent power imbalance and quasi-coercive nature of the prison environment, such use of neurostimulation – intended to alter an individual's mental states, processes, or traits – could profoundly affect the individual's (mental) self-determination, (mental) integrity, personal identity, and freedom of thought. Would such practices, therefore, infringe upon the right to private life (including mental and bodily integrity) (Article 8 ECHR), the prohibition of torture and degrading treatment (Article 3 ECHR), or the right to freedom of thought (Article 9 ECHR) as protected under human rights law?

2. *Education context*

A major commercial technology company markets brain stimulation headsets directly to the public, with a particular focus on students. The device claims to enhance working memory and attention, thereby improving productivity and academic performance. As it is not classified as a medical device, existing medical regulations do not apply. This raises critical questions: Does the use of such devices in an educational context give rise to concerns related to the rights to private life (Article 8 ECHR), to freedom of thought (Article 9 ECHR), to benefit from scientific progress (Article 27 Universal Declaration on Human Rights; Article 15 International Covenant of Economic, Social, and Cultural Rights), and to health (Article 11 European Social Charter, Article 12 ICESCR; Article 22 Convention on the Rights of Persons with a Disability), particularly since it mainly concerns a vulnerable group – i.e. children and adolescents – who may be exposed to competitive academic pressures?

Substantive indicators In light of the workshop's objectives and overall structure, the following questions could guide the presentation by the speakers, and be instructive for the following panel discussion:

CHANGE OF PANEL & INTRODUCTION BY MODERATORS *12.00 – 12.10*

The moderators should briefly present the aim and scope of the session. This includes briefly outlining the scope and meaning of the key concepts and rights that will be of central focus. Subsequently, they should introduce the panellists.

SESSION *12.10 – 13.00*

VASSILIS TZEVELEKOS*: (How) does the right to freedom of thought (Article 9 ECHR) protect against problematic instances of neurotechnological interventions with people's mental states and processes that affect people's (mental) autonomy, personal identity, and/or sense of self?* (*15 minutes)*

The speaker is invited to explain what it means for the right to freedom of thought to protect against "impermissible alterations of thought." What does this safeguard entail? And how might it apply to cases where NTs alter mental states by modifying brain activity?

It would also be instructive for the speaker to clarify the concepts the ECtHR uses when addressing alleged violations of the internal dimension of Article 9 ECHR. What is meant by terms such as "brainwashing," "improper pressure," or "spiritual coercion," and could these concepts be applied to thought alterations induced by NT? And are notions such as (mental) autonomy, personal identity, and sense of self reflected in the case law, or linked to other concepts?

If relevant interpretations of the right to freedom of thought that can be directly or analogously applied to the context of NT are absent, it should also be explicitly mentioned.

PAULO SERGIO PINTO DE ALBUQUERQUE: respondent (10 minutes)

FOLLOW-UP DISCUSSION QUESTIONS (Moderator)

- What mental states and processes qualify as 'thought', particularly in the context of the right freedom of thought's internal dimension? Are there relevant indicators in the ECtHR to define the concept of thought?
- Form the ECtHR case law, is there any consistency in the criteria we could identify to determine whether alterations of thought are 'impermissible'? And would such criteria be helpful in the assessment of cases pertaining to neurotechnological interferences with thought?
- What is the underlying aim of the protecting against impermissible forms of thought alteration included in the right to freedom of thought? Does it safeguard (mental) autonomy? Does it (implicitly) protect people's personal identity and the sense of self? Or on a fully different level, is it primarily devoted to the protection of democracy and pluralism? Or any are these interests rather or better protected by other rights?
- Does the right to freedom of thought have a recognized positive dimension in existing case law – or, if relevant, the preparatory works to the ECHR. Think in the direction of a freedom to use neurotechnology to influence one's own thoughts as one wishes?
- How does it relate to the right to freedom of opinion (Article 10 ECHR) in its internal dimension in this context?

SESSION *14.30 – 16.00*

MONIKA HERMANNS: *(How) does the right to private life (Article 8 ECHR) protect against problematic instances of neurotechnological interventions with people's mental states and processes that affect people's (mental) autonomy, personal identity, and/or sense of self? (15 minutes)*

The speaker is invited to explore how the right to private life under Article 8 ECHR may protect against unsolicited interference with one's brain and mental processes. The discussion should focus particularly on the impact of neurostimulation on (mental) autonomy and personal identity.

Article 8 ECHR is understood to protect not only privacy but also autonomy and identity. How does ECtHR case law shape these concepts? Is there a distinct right to autonomy and a distinct right to personal identity, or are these general human rights principles that underpin the entire Convention? Based on this understanding, to what extent do these rights and principles provide operational safeguards against unsolicited neurotechnological interventions affecting mental autonomy and personal identity? And what do such safeguards look like?

If any relevant principles that can be directly or analogously applied to the context of NT are absent, it should also be explicitly mentioned.

PAULO SERGIO PINTO DE ALBUQUERQUE: respondent (10 minutes)

FOLLOW-UP DISCUSSION QUESTIONS (Moderator)

- Has the ECtHR provided any relevant interpretation of a right to personal autonomy or personal identity that may be linked to the *forum internum*? What meaning do these concepts hold as autonomous rights or general principles of human rights law in the context of neurotechnology?
- Are there any justifiable circumstances under which altering interventions with a person's mental states and processes could occur without their consent?
- How is the right to (mental) integrity interpreted in the case law of the ECtHR, and does it extend to protecting the mental dimension of autonomy and personal identity – beyond merely requiring free and informed consent for the use of biotechnologies and protect against mental harm sensu stricto?
- Does the right to private life – including its dimensions of autonomy and identity – include a positive aspect that guarantees individuals the freedom to self-determine neurotechnological interventions on their own mental states and processes to shape their identity or alter their sense of self? If so, are there any indications of limits to this positive interpretation of autonomy under Article 8 ECHR?

FEDERICO DE MONTALVO*: (How) does the right to private life (Article 8 ECHR) and the prohibition of torture prohibition torture, cruel, inhuman or degrading treatment (Article 3 ECHR) protect individuals against mental harm? (15 minutes)*

The speaker is invited to outline how the right to personal integrity, enshrined in Articles 3 and 8 ECHR, protects against bodily and mental harm in the context of NT. The use of cutting-edge technologies, whose full physical and psychological effects are not yet fully understood, raises complex questions about the application of this right in high-tech contexts.

Particular attention should be given to the right to mental integrity. While the ECtHR has elaborated bodily integrity in considerable detail, mental integrity – also referred to as psychological or moral integrity – remains less clearly conceptualized. Based on ECtHR case law, what constitutes 'mental harm' under this right? Are there any indications regarding the threshold of severity that distinguishes protection under Article 8 ECHR from that under Article 3 ECHR?

PAULO SERGIO PINTO DE ALBUQUERQUE: respondent (10 minutes)

FOLLOW-UP DISCUSSION QUESTIONS (Moderator)

- What is the relevance of the right to bodily integrity to protect not only against bodily harm, but indirectly also to neurotechnological interventions that cause harmful or non-consensual mental effects?
- How is 'psychological/mental harm' interpreted under Articles 8 and 3 ECHR, and what relevance does this interpretation have in the context of potential harm caused by neurotechnologies, both in medical and non-medical settings?
- Free and informed consent is a central safeguard for the right to private life, including personal integrity. How has the ECtHR applied this notion in its case law in relation to emerging technologies, where the physical and mental effects are not yet fully known or understood? And is it an effective notion for protecting integrity – and ultimately dignity – in both medical and commercial contexts?
- What neurotechnology uses would reach the severity threshold as construed in the ECtHR case law for the application of Article 3 ECHR?

FIRE-ROUND QUESTION (FOR THE 3 PRESENTERS, MAX. 3 MINUTES EACH)

How should human rights protections be strengthened to address actual or potential gaps? Should we focus on improving existing frameworks through interpretation, or explore entirely new approaches?

Neurotechnology and human rights – Session IV

CONCLUDING SESSION
16.30 – 18.00

This briefing note serves as a topical guide for the speakers and moderators of the session. It outlines key issues for consideration during the discussion. The suggested questions and issues are suggestions and are by no means intended to limit the scope of the speakers' the speakers' freedom to determine the scope of their analysis or their approach to the subject.

Moderators **Laurence Lwoff,** *Head of the CoE Health Division*
Milena Costas, *Member of the UN Human Rights Advisory Council*

Speakers **Tomáš Doležal,** *Chair of the CDBIO*
Krista Oinonen, *Chair of the CDDH*
Alessandra Pierucci, *T-PD*

Goal The aim of this concluding session is to summarise key takeaways and offer a cautiously forward-looking perspective, without, however offering concrete policy-making suggestions.
Building on the previous sessions, this session seeks to:

1. Identify existing human rights safeguards most relevant for addressing the novel, emerging challenges brought about by neurotechnological development;
2. Highlight both strengths and limitations of existing human rights protections in the context of neurotechnology;
3. Explore potential – both formal and substantive - pathways to bolster the European human rights framework in response to neurotechnological developments.

Structure This session will begin with an introduction by the moderators, who will briefly summarise and highlight key takeaways from the previous sessions. It will then proceed with three consecutive panel discussions, each dedicated to one of the session's goals. The session will conclude with comments from the rapporteurs, highlighting the day's key insights, followed by closing remarks from the CDBIO Chair and/or the Chair of the Preparatory Group.

16.30 – 16.35	16.35 – 17.00	17.00 – 17. 25	17.25 – 17.50	17.50 – 18.00
Introduction by moderators *Milena Costas & Laurence Lwoff*	**Existing safeguards** *Tomáš Doležal, Krista Oinonen, Alessandra Pierucci*	**Strengths and limitations** *Tomáš Doležal, Krista Oinonen, Alessandra Pierucci*	**Future action** *Tomáš Doležal, Krista Oinonen, Alessandra Pierucci*	**Comments by rapporteurs & Closing by** *Tomáš Doležal / Anne Forus*

Substantive indicators Considering the coherence of the whole workshop and smooth adherence to the previous sessions, it is suggested that the following elements could be touched upon: (Inspiration for both moderators and panellists)

INTRODUCTION BY MODERATORS *16.30 – 16.35*

In line with the session's objectives, the moderators are invited to briefly summarise the earlier workshop discussions and highlight key issues raised. This will set the stage for the three panellists, who, drawing on their roles as representatives of the respective CoE bodies, will formulate key takeaways from those discussions from their particular perspectives.

PANEL DISCUSSION – EXISTING SAFEGUARDS *16.35 – 17.00*

- What are the most pressing human rights challenges in light of the mission of the respective CoE body you represent?
- From the perspective of the mandates of the respective CoE body you represent, which existing human rights protections are particularly relevant to safeguarding individuals and society in the context of proliferating neurotechnologies?

PANEL DISCUSSION – STRENGTHS AND LIMITATIONS *17.00 – 17.25*

- Which fundamental interests (such as privacy, autonomy, integrity) remain insufficiently protected under the current European human rights framework, particularly in the light of the mission of the respective CoE body you represent?
- Where specifically do current safeguards fall short? Consider protections such as the right to freedom of thought, the right to private life, and overarching principles like human dignity, autonomy, and equality; How adequately do these address the (mis)use of neurotechnology?

PANEL DISCUSSION – FUTURE ACTION *17.25 – 17.50*

- Is policy action needed to strengthen human rights protections against the risks of neurotechnological advancement?
- What form might such initiatives take in the light of the mandate of the respective CoE body you represent, and what may the aimed outcome be (potentially also on other regulatory level beyond the respective CoE bodies)?
- Would cooperation with other organisations be a valuable path forward?
- What role can / should other actors, including courts, international organisations, national state actors, and experts play in strengthening protections of mental states and processes?
- Which values – such as human dignity, self-determination, (mental) privacy, autonomy, and integrity – should underly a human-rights based approach to the regulation of neurotechnologies?
- Given that most advancements in neurotechnology are driven by private actors, can European human rights law effectively safeguard privacy, self-determination, freedom of thought, and integrity against potential violations arising from neurotechnology uses?

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