TECHETHOS

FUTURE ○ TECHNOLOGY ○ ETHICS

Technology Factsheet

Neurotechnologies

Focus	Interaction with the human body
Description	Neurotechnologies refer to health technologies that aim at affecting and emulating human-brain capabilities and functions through artificial replacements or add-ons in a two-way interaction between the brain and the external environmnent or systems.
Key functions and capabilities	Interacting, collecting, and transmitting information and stimuli from/into the human brain (e.g., from/to the nervous system) through internal and external devices
Key Industrial sectors	ICT and digital; medical healthcare; automotive
Examples of technologies	Human-brain-machine interaction, e.g. artificial synapses; artificial brain; (direct) brain-machine interfaces
Example of applications	Human-machine symbiosis; brain-to-brain communication; applications to cure mental health diseases; brain stimulation to contrast diseases (such as Parkinson); efficient self-repair dysfunctional brain circuits enabled by AI; restoring a lost sense; allowing the brain to interact with the environment; strengthen or reroute information from injured areas of the brain
Time horizon to mass market	Medium- to long-term

Key ethical issues

Human rights ○ Autonomy ○ Integrity and human nature ○ Responsibility ○ Privacy and Data Protection ○ Human Interaction ○ Dual use/ Misuse ○ Irreversibility ○ Scientific Integrity ○ Overstretched Promises ○ Precautionary Measures ○ Equal Access

Selection rationale:

Its potential to affect the structure, functions and capabilities of the human brain, including thinking, feeling and interacting with the world, affecting personhood and the way we perceive humans and disrupting healthcare practices.

Expected public impact

- Impact on people's health and safety, as well as average life expectancy;

- Key areas of potential impact include good health and well-being, reduced inequalities, education, training and life-long learning; health care; inclusion of people with disabilities and long-term care.

Expected policy impact

- Priority for most national, EU and global policy organizations that deal with public health;

- Policies are mostly oriented to support research and prototyping activities.

Expected industrial and economic impact

- Includes radical innovations;

- Considered enabling in heathcare and potentially other sectors;

- Priority by some industrial players in healthcare, a highly valuable sector;

- Most of the technologies are relatively far from the market, making it difficult to foresee (potentially high) industrial and economic impacts.

Expected legal impact

- Significant changes in existing legal frameworks.

At a glance

TechEthos (Ethics for Technologies with High Socio-Economic Impact)

Funding	Horizon 2020 Research and Innovation Programme's Science and for Society (SwafS)
Duration	2021 – 2023 (3 years)
EU grant	€3.99 million
Coordinator	AIT - Austrian Institute of Technology
Consortium	16 organisations from 13 countries
Website	www.techethos.eu
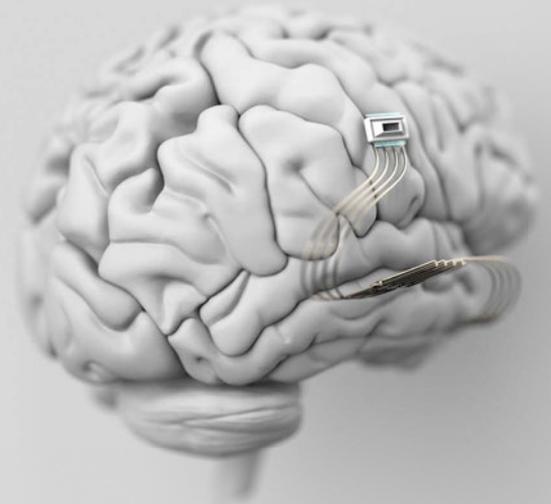
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