PRESS RELEASE, 25 JUNE 2021

AI-Mind joins forces with EBRAINS research infrastructure to tackle the challenge of brain diseases

Collaboration between key strategic initiatives is a step towards an artificial intelligence revolution in brain healthcare

On 27 May, the European Future and Emerging Technology Flagship project, the Human Brain Project (HBP), announced the winners of its EBRAINS Research Infrastructure Voucher Call. **AI-Mind,** a Research and Innovation Action (RIA) project led by Prof. Ira Haraldsen of Oslo University Hospital, was one of only thirteen projects worldwide that were successful with their applications. With this, the AI-Mind project gets access to the EBRAINS research infrastructure and digital tools that have been developed with, by and for researchers to address challenges in brain research. The Voucher covers the work of an expert team led by Prof. Petra Ritter of Charité University Medicine Berlin, which will help to implement tailor-made workflows that are compliant with the General Data Protection (GDPR) to enable AI-Mind to best use the EBRAINS infrastructure. The third element that completes the alliance triangle is The Virtual Brain Cloud Project (TVB-Cloud), a programme of the European Open Science Cloud that develops virtual brain simulations. The collaboration of these initiatives not only aligns with the European Digital Health[1] strategy in using digital technologies for the benefit of patients, but is also the first with the potential to take a critical step towards an artificial intelligence (AI) revolution in brain healthcare. Moreover, the alliance of AI-Mind, TVB-Cloud and HBP is timely because the European Commission recently proposed the very first legal framework on AI in healthcare.[2]

Why is this collaboration important?

The human brain is the most complex structure in the world. This single organ controls every aspect of our bodies, ranging from heart rate to emotion, learning and memory. At the same time, the human brain is also the origin of many disabling diseases that have a huge impact on the lives of individuals and on national health systems. One of the most common such diseases is dementia, which affects over 50 million people worldwide and is one of the most urgent health challenges of an ageing society. However, it is yet to be discovered how brain connectivity impacts progression to dementia; if we knew how neurons communicated under such conditions, we could improve our understanding of this disease and develop better predictive, preventative and treatment measures.

What will be the impact?

The AI-Mind project aims to develop two AI-based tools—AI-Mind Connector and Predictor—that will identify patients with mild cognitive impairment (MCI) who are at risk of dementia and facilitate early

[1] https://ec.europa.eu/health/ehealth/home_en

[2] European Commission, Laying down harmonised rules on artificial intelligence (artificial intelligence act) and amending certain union legislative acts, doc. 52021PC0206

preventative strategies. This will reduce the need for unnecessary investigations of low-risk people and, potentially, prolong the functional independence of patients at risk of developing dementia.

The AI-Mind Connector and Predictor will jump-start the development of an entirely new segment of digital diagnostics devices in the area of dementia and other cognitive neurodegenerative diseases. According to the European Commission's (EC) policy on AI from 2021, AI technologies can ease the burden on healthcare systems and support the discovery of new medicines.[3] One of the most important elements that will determine whether this ambitious goal can be reached is the coordination and exchange of patients' data, including brain images, between countries. To help a clinical shift to happen, AI-Mind will seek a harmonised approach to data exchange and the use of AI that offers the opportunity to overcome the limitations of current diagnostic procedures. In 2020, the EC took action to establish a European health data space. Now, the collaboration of AI-Mind, VBP and HBP paves the way to regulatory changes that could enable the creation of an EU-wide databank with EEGs. Access to high-quality data is an essential factor in building high-performance, robust AI systems. To achieve the greatest effectiveness in supporting health professionals with diagnosis and thus timely treatment for patients, AI-based tools must be fed big data sets. Only through collaboration can enough datasets be collected and processed for use in the development of AI-based brain screening tools.

Putting the pieces together

By linking Europe's fragmented resources through cross-border digital infrastructure, significant breakthroughs in health can be achieved.[4] The EBRAINS Voucher makes possible the partnership of AI-Mind, TVB-Cloud and HBP—three important European initiatives in the digitalisation of the brain.

The AI-Mind project, including both retrospective and prospective studies, will collect a large quantity of brain data to determine how neuro-connections change in people affected by MCI during their lives. With access to these EEG data sets, experts within the AI-Mind consortium will develop an algorithm to identify changes in the brain typical to specific disorders, such as dementia. To better understand how these changes progress, AI-Mind needs a technologically advanced brain model to simulate such changes and develop its solutions.

TVB-Cloud provides simulation of brain network models by mimicking the activity of groups of neurons. By integrating information from many patients, such as scans and EEGs, the virtual brain can create simulations based on an individual's unique characteristics. This will provide the opportunity to track and study how alterations in the brain occur. To feed the AI engine, big data sets are required, which will be delivered by AI-Mind.

HBP funds the work of a dedicated expert team for the development and implementation of new tailor-made infrastructure features for EBRAINS based upon the requirements of the AI-Mind project and its developed algorithms. EBRAINS then provides digital tools to assist researchers in analysing, sharing and integrating surface data.

The complementary technologies from the AI-Mind and Virtual Brain Project meet in the EBRAINS environment, pushing the boundaries of innovation and the use of AI in brain healthcare to the next level.

---

[3] European Commission, The 2021 Coordinated Plan on Artificial Intelligence (AI)

[4] European Commission, Communication on enabling the digital transformation of health and care in the Digital Single Market; empowering and building a healthier society, Doc. 52018DC0233.

About AI-Mind

AI-Mind is a Norwegian coordinated project that has received a budgeted EUR14 million of funding from the European Union's Horizon 2020 RIA under grant agreement No 964220. This five-year project officially started in March 2021.

Fifteen project partners from eight European countries, including academic institutions, clinical centres, SMEs and patient organisations make up the AI-Mind consortium: Tallinn University (**Estonia)**, Aalto University and Helsinki University Hospital (**Finland)**, Oslo University Hospital, BrainSymph AS, DNV-GL, and Oslo Metropolitan University (**Norway)**, the Scientific Institute for Research, Hospitalization and Healthcare, San Raffaele Pisana, Neuroconnect Srl, Università Cattolica del Sacro Cuore (**Italy)**, Radboud University Medical Center (**Netherlands)**, Alzheimer Europe (**Luxembourg)**, the Complutense University of Madrid (and Universidad Politécnica de Madrid as the third party) and Lurtis Rules (**Spain)**, and accelopment Schweiz AG (**Switzerland)**.

AI-Mind is a partner project of DigitalLife Norway. Supporting organizations are CLAIRE and NORA.

Contact

Project Coordinator
Ira Haraldsen
Oslo University Hospital
Email: ira.haraldsen@icloud.com
M: +47 920 11 5 33

For media
Email: contact@ai-mind.eu

Web pages
https://www.ai-mind.eu/
https://virtualbraincloud-2020.eu/
https://www.ebrains.eu/

About the Human Brain Project

The Human Brain Project (HBP) is the largest brain science project in Europe and stands among the biggest research projects ever funded by the European Union. At the interface of neuroscience and information technology, the HBP investigates the brain and its diseases with the help of highly advanced methods from computing, neuroinformatics and artificial intelligence, and drives innovation in fields like brain-inspired computing and neurorobotics.

About EBRAINS

EBRAINS is a **new digital research infrastructure**, created by the EU-funded Human Brain Project, to foster brain-related research and to help translate the latest scientific discoveries into innovation in medicine and industry, for the benefit of patients and society.

It draws on cutting-edge neuroscience and offers an extensive range of brain **data** sets, a multilevel brain **atlas**, **modelling and simulation** tools, easy access to **high-performance computing** resources and to **robotics** and **neuromorphic** platforms.