The AI-Mind project reports on significant progress

Global efforts between collaborators working on the AI-Mind project are at a point of coming to fruition with new data generated and the development of AI digital tools for dementia prevention.

Funded by Horizon 2020, the AI-Mind project officially started in March 2021 for a duration of five years. The goal of the project is to develop artificial intelligence (AI) digital tools for screening brain connectivity and dementia risk estimation. These tools aim to support healthcare professionals in their diagnosis and enable them to predict which people with Mild Cognitive Impairment (MCI) will eventually develop dementia. AI-Mind has now reached its mid-term, marking the successful completion of half of its milestones and deliverables and marking thus a pivotal moment in its journey.

The AI-Mind study

The AI-Mind study is at the heart of the project and it helps to develop and validate AI-based tools to predict who is likely to develop dementia. The AI-Mind study, launched in January 2022, is the largest European study of this kind aiming to recruit 1,000 participants with MCI across four European countries: Finland, Italy, Norway and Spain. It is important to acknowledge the monumental effort made by the clinical teams in the recruitment and data collection processes. Their unwavering commitment has culminated in the achievement of the recruitment target, marking a significant milestone for the AI-Mind study. Participants have now started with their follow-up visits at clinical sites, some already embarking on their fourth visit.

Launch of the AI-Mind platform

Central to the AI-Mind project are two digital tools: the AI-Mind Connector and the AI-Mind Predictor, which will be integrated into a cloud-based diagnostic support platform. The AI-Mind Connector will identify dysfunctional brain networks (e.g. synaptic malfunction and loss of connectivity which characterise signs of dementia) and the AI-Mind Predictor will assess dementia risk using data from the Connector, advanced cognitive tests and genetic biomarkers.

Massive work has been done to develop the AI algorithms for the AI-Mind Connector and Predictor and on the interactive visualisation tools. With anticipation running high among partners, 2024 marks the transition into a new phase as algorithms are applied to AI-Mind data. This crucial step will not only validate the efficacy of the developed tools but also pave the way for their integration into clinical practice.

Ethical reflection on the use of AI-based dementia risk prediction in the clinical setting

Whilst AI is increasingly being used in many areas of people's everyday lives, the successful use and ongoing development of this kind of technology is highly dependent on patients and doctors finding it trustworthy and being willing and able to use and understand it. In collaboration with AI-Mind partners, Alzheimer Europe conducted a rapid review of the literature about ethical and social implications of this specific topic. Alongside this review, they organised a series of interviews, focus group discussions and a short survey to help ensure that the various ethical, societal and practical issues considered reflect the views, beliefs, assumptions and possible concerns of lay people from some of the groups affected by the use of these tools, and of clinicians, in addition to those of published scholars and AI specialists. This led to the development of a comprehensive strategy for the ethical and trustworthy communication of AI-based dementia risk prediction to people with MCI in the clinical setting.

A successful General Assembly meeting in Amsterdam

This year, the AI-Mind project enjoyed a successful General Assembly in March in Amsterdam, marking yet another significant milestone in its journey. The meeting provided a chance to gather all partners and collaborators who work on the project to reflect on progress and discuss future activities. The meeting coincided with Brain Awareness Week, making the event an excellent opportunity to raise awareness of the importance of brain health. One of the highlights of this year's General Assembly was the panel discussion featuring young researchers from the project, underscoring the project's commitment to fostering interdisciplinary collaboration and involving the next generation of researchers.
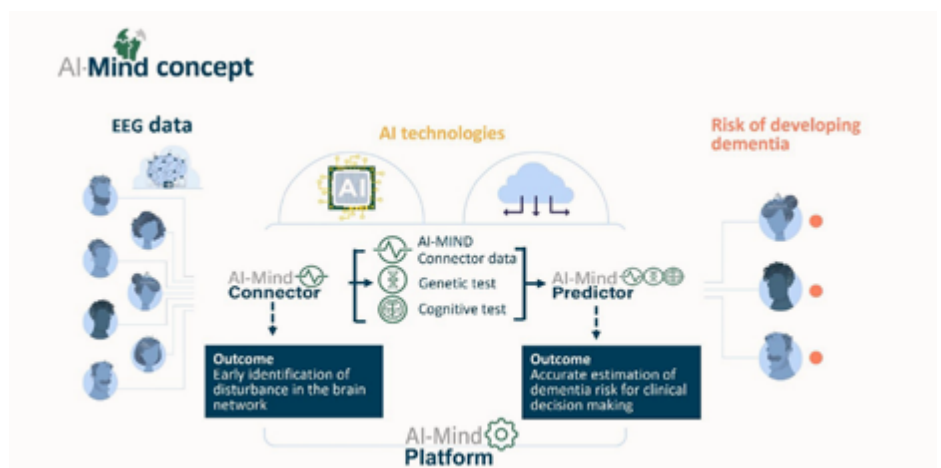
AI-Mind Concept

The meeting was held at the iconic Nemo Museum – the Studio, where AI-Mind is promoted with the "Living Longer" exhibition. Running until January 2025, the exhibition explores strategies for maintaining long-term health. AI-Mind has contributed to this exhibition, showcasing a cap designed for screening brain connectivity using the electroencephalogram (EEG) method. This exhibit not only raises awareness about the project but also raise awareness of dementia and scientific advancements.

Effective outreach

AI-Mind has made significant strides in public outreach and engagement. The new year commenced with an array of positive developments, including the publication of three papers, all available in full open access, in alignment with the European Commission's Open Science policy. The AI-Mind protocol paper has been published in the journal Frontiers in Neurorobotics, representing a great milestone in the project's research journey. Crucially, it lays the foundation for future scientific contributions by providing insights into the background of the AI-Mind study and the potential impact of the project on dementia risk assessment. In another paper published in Frontiers in Neuroinformatics, authors shed light on the innovative methodologies being employed within the AI-Mind project. Most recently, our researchers

AI-Mind General Assembly Meeting, Helsinki (Finland), October 2023

unveiled a compelling paper in the Journal of Alzheimer's Disease showing a significant impact of dementia risk predictions on quality of life and highlighting the importance of caution when sharing information about expected MCI disease course.

The AI-Mind project has been very well represented at international and national events in the past several months. The most recent public-facing activity of the project came at the Alzheimer Europe Conference which took place in Helsinki in November 2023. AI-Mind had a booth in the exhibition area, several oral and poster presentations and a dedicated session entitled "The Potential of Artificial Intelligence for Dementia Risk Prediction". The session attracted over 70 participants and

featured four thought-provoking presentations from experts in the field. Please note that these valuable presentations are accessible to a global audience on the AI-Mind YouTube channel.

Finally, the AI-Mind consortium has grown with the inclusion of four new partners, further enriching its expertise, becoming even more representative of the European landscape. With continued collaboration and dedication, AI-Mind is poised to not only achieve its objectives but also make an impact on the field of dementia prevention. By leveraging the power of AI, the project stands at the forefront of efforts to address the growing challenge of early risk prediction.

A few words from Ira Haraldsen, the AI-Mind Project Coordinator

Ira Haraldsen, speaking at the Alzheimer Europe Conference, Helsinki (Finland), October 2023

"With 2024, our project has entered a pivotal stage, with the consortium collectively focusing efforts on advancing towards our goals. Our primary focus now is to optimise the AI-Mind platform, refine algorithms and ensure efficient dissemination. AI-Mind data are now being processed, with the plan to disseminate findings at upcoming international presentations, marking a significant milestone. Looking ahead, it is crucial to acknowledge the research achievements while remaining open to post-project improvements for the long-term dementia prevention goals."

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