AI-Mind

NEWSLETTER
June 2024

In this issue

Dear reader,

Welcome to the third issue of the AI-Mind study newsletter!

As we embark on this journey of discovery, we invite you to explore the advancements in dementia research and the ongoing progress of the AI-Mind project. This newsletter aims to keep you informed about methodologies for early dementia diagnosis, research on dementia-related topics and lifestyle interventions. By staying engaged, you'll gain an understanding of our project's potential impact on dementia research.

Our sincere gratitude goes to all the dedicated participants in the AI-Mind study.
Your commitment has been instrumental in advancing our knowledge of brain function.
Stay informed, stay inspired!

Visit our website

www.ai-mind.eu

Find us on social media

@AIMind-eu

@The AI-Mind Project

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 964220. This document reflects views of author and the European Commission is not responsible for any use that may be made of the information it contains.

Meet Prof. Camillo Marra, a leader of our study

UNIVERSITÀ CATTOLICA del Sacro Cuore

What inspired you to become a clinician/researcher?

To be speculative was my main attitude that teachers have recognised already since primary school. My first idea was to become a physics or a chemical doctor. During my secondary school philosophy and human science were at first place as my favourite courses. Thus I think that medicine has been a good compromise and, to better understand the nature of human thinking and social functioning, neurology and neuropsychology were the natural disciplines that encompassed most of my natural attitude.

What are your interests and hobbies outside of work?

Too much work to do to have complex hobbies that require frequency and regularity. I like gym, skiing and biking with my group. I like also photography when I travel.

What do you say to the study participants?

I always say that they are doing something useful not only for themselves but also for the next generations. They help researchers to have a better understanding of how to control and prevent dementia globally.

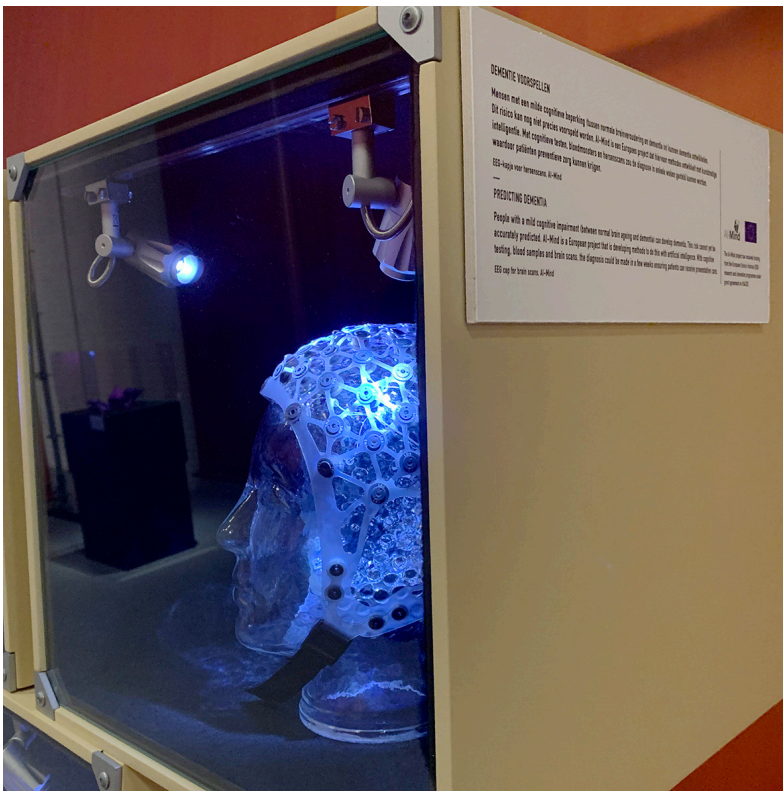
What does the AI-Mind project give you?

The AI-Mind project allows me to know many scientists with different backgrounds and expertise that make all things fascinating. Collaborating with such passionate experts also empowers my personal growth. Beyond the clinical and scientific aspects, the project exposes me to the importance of other research-related components, such as dissemination and the practical application of new findings in real-world health systems. This holistic approach underscores the importance of validation and usability, ensuring that advancements can be effectively integrated into healthcare systems.

AI-Mind 8th General Assembly at NEMO Science Museum

Is it possible that in the future we could reach the age of 150, or maybe even live for a whole millennium?
And how would such a long life affect our zest for life or social roles?
On January 19, 2024, NEMO Studio (part of the NEMO Science Museum) in Amsterdam welcomed visitors to the Living Looonger exhibition dedicated to the fascinating world of ageing. It offers an excellent opportunity to witness the synergy between scientific breakthroughs and the exploration of age-related mysteries.

AI-Mind has contributed to this exhibition, showcasing a cap designed for screening brain connectivity using the electroencephalogram (EEG) method. Read more about this method on the following pages. The exhibition will run until January 2025 exploring strategies to stay healthy for the long haul.



Using this exceptional opportunity, the much-anticipated AI-Mind 8th General Assembly (GA) was organised at the iconic NEMO Studio. The event, which took place in the vibrant city of Amsterdam on March 11th and 12th, brought together more than 50 in-person attendees. Clinicians, researchers in neuroscience, experts in health technology assessment, and artificial intelligence (AI) developers met to share the progress of their work and plan the next steps. The meeting was indeed, a hub of collaboration, scientific discussions, and insights into project progress, and we are happy to report:

- The project reached its mid-term with all planned tasks successfully completed on time.
- Partners representing clinical sites shared strategies for minimising dropouts among study participants, ensuring robust data collection for further analysis.
- The AI models being developed can be tailored to meet the specific needs of clinicians in the decision-making process, enhancing their usefulness in real-world healthcare settings.

It is worth mentioning that our GA coincided with Brain Awareness Week, making the event an excellent opportunity to raise awareness of the importance of promoting good brain health.

Read the full article on our website:

https://www.ai-mind.eu/blog/takeaways-from-ai-minds-8th-general-assembly/

Brain screening methods and their use

Electroencephalography (EEG), records your brain's electrical activity. It functions like a camera capturing the electrical signals that your brain cells send to each other. Small metal discs called electrodes are placed on your scalp to pick up these signals. The signals are amplified and displayed as wavy lines on a computer screen.
This helps doctors detect irregular patterns in the brain's activity, aiding in the diagnosis of conditions like seizures, epilepsy and sleep disorders. Essentially, an EEG gives doctors a glimpse into your brain's electrical function to monitor its health.

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Electroencephalography (EEG) in our study

We perform EEG screening during each of the four visits to the clinical site.

We use a specialised EEG tool for data collection and visualisation. We ensure consistency across countries by using the same measurement settings.

EEG recordings take place at all clinical sites

Magnetoencephalography (MEG), functions similarly to a sensitive compass that detects the magnetic fields created by your brain's activity. As your brain's neurons fire and communicate through electrical impulses, they also generate tiny magnetic fields measured with a sensitive device, called a magnetometer. It captures signals non-invasively, providing real-time and more detailed insight into brain patterns.
This helps track brain communication during different tasks and activities, crucial for studying cognitive responses. In essence, MEG offers scientists and doctors a detailed view of the brain's magnetic landscape, helping them to monitor and assess brain health and function.

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Magnetoencephalography (MEG) in our study

At two clinical sites, we also perform MEG screening during the first and last visit.

Using both MEG and EEG offers a more complete understanding of brain activity compared to using either method alone.
We can better pinpoint brain activity thanks to their complementary nature.

MEG measurements take place only in Finland and Spain.

Why do we analyse blood samples?

A blood sample may reveal valuable information about the risk of developing dementia by analysing specific proteins and genetic markers associated with the condition. As studies show, some proteins are present in unusual levels among those who develop all-cause dementia, Alzheimer's disease or vascular dementia. Additionally, genetic markers like the apolipoprotein E (APOE) gene can indicate a higher susceptibility to dementia. By collecting blood samples researchers and clinicians gain a more comprehensive understanding of a persons' health, enhancing their ability to assess future dementia risk.

Blood samples analysis in our study

Clinicians collect blood samples from participants during their first visit to the clinical site.

One aspect that AI-Mind researchers look at through blood analysis is the gene called apolipoprotein E, which is the most prevalent genetic risk factor for Alzheimer's disease.

Blood samples are collected at all clinical sites.

When combined with traditional risk factors like age, sex, education and genetic susceptibility, these protein profiles enable researchers to predict dementia with impressive accuracy, and well before a clinical confirmation of the disease. This holistic approach not only aids in early intervention but also contributes to the ongoing efforts to unravel the complexities of dementia.

More information

You can find more information about dementia, risk factors and challenges in the following sources:

Dementia & reducing your risk
(Source: Alzheimer's Society)
https://www.alzheimers.org.uk/sites/default/files/2023-01/35-Dementia-Reducing-your-risk.pdf

Preventing Alzheimer's Disease: What Do We Know?
(Source: National Institute on Aging)
https://www.nia.nih.gov/health/alzheimers-and-dementia/preventing-alzheimers-disease-what-do-we-know

AI-Mind study updates

The study is a key part of our project, helping to develop and validate AI-based tools to predict who might develop dementia. Launched in January 2022, it is the largest European study of its kind, involving 1,000 participants across four countries: Finland, Italy, Norway, and Spain. Here's a look at how the study is progressing in each country:

In Finland, the study is moving along smoothly. The first group of participants has finished their initial visits, and some have started their fourth visits. Researchers are also welcoming others for their second and third visits.

In Italy, the study is progressing well at two clinical sites in Rome. Participants from the city and nearby areas are taking part in the study. Most come alone, but some are accompanied by caregivers, as needed.

In Norway, all participants have reached their fourth visits. They come from various parts of the country, from Tromsø in the north to Kristiansand in the south. Some even travel from abroad to take part in the study.

In Spain, follow-up visits are underway, with most participants coming from Madrid and Ciudad Real, two hours away from the city. Finishing their second and third visits, participants receive on-site feedback about their mental status from a neuropsychologist.

Looking ahead, AI-Mind researchers are preparing to analyse the collected data and are getting ready for the participants' final visits. With further follow-ups conducted, the information about those who progress from mild cognitive impairment (MCI) to dementia will be shared with the participants.

We deeply value the commitment of our study participants. We strive to keep them informed about their cognitive status, building trust and support as the study progresses. This partnership between researchers and participants is vital, creating an engaging and supportive environment as we move forward together.

You can monitor our progress on the AI-Mind study page: www.ai-mind.eu/study

Upcoming events

European Academy of Neurology Congress
Helsinki, Finland; 29 June – 02 July

The 10th European Academy of Neurology (EAN) will be held this year with the annual congress attracting more than 6,000 delegates each year to share research results and exchange current best practices.
Read more: https://www.ean.org/congress2024

Link

Alzheimer's Europe Conference
Geneva, Switzerland; 08 – 10 October

Alzheimer Europe conferences are truly unique, bringing together people living with dementia and their families, carers and supporters, but also volunteers and staff of Alzheimer associations, policymakers, health and social care professionals, researchers, academics and industry.
Read more: https://www.alzheimer-europe.org/conferences/2024-Geneva

Link

17th Clinical Trials on Alzheimer's Disease Conference
Madrid, Spain; 29 October – 01 November

The Clinical Trials on Alzheimer's Disease Conference (CTAD) is a meeting focused entirely on Alzheimer's disease clinical trials with key leaders getting together and forming partnerships with the objective of speeding the development of effective treatments to fight the disease.
Read more: https://www.ctad-alzheimer.com/

Link