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LETHE - A personalized prediction and intervention model for early detection and reduction of risk factors causing dementia, based on AI and distributed Machine Learning

Wednesday, 20 October 2021 14:40 (15 minutes)

Aim of the LETHE project is to create a personalized prediction and intervention model for early detection and reduction of risk factors causing dementia, based on artificial intelligence (AI) and distributed machine learning (ML).

The roots of LETHE project are deep and based on the result of research, studies and clinical data collected over the past 10 years. Memento, PredictND and the FINGER Study (Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability) are among the past projects and studies whose knowledge have become an integral part of LETHE project over time.

Thanks to the heritage of the FINGER study, now widespread worldwide, it has been possible to demonstrate that prevention of cognitive decline in individuals at risk, by intervening on various aspects of lifestyle, is an effective health strategy. The LETHE project sets out to evolve the results of this impressive clinical study into a digital model - FINGER - based on the Internet of things, Mobile, Big Data and Artificial Intelligence (AI) technologies. The strategies for the prevention of cognitive decline will therefore be directed towards technological horizons usable and accessible to the ageing European population.

LETHE will establish novel digital biomarkers, for early detection of risk factors, based on unobtrusive ICT-based passive and active monitoring. The aim is to establish a digital-enabled intervention for cognitive decline prevention based on the evolution of a successful protocol (FINGER) evolving into an ICT-based preventive lifestyle intervention through individualized profiling, personalized recommendations, feedback and support (FINGER), well targeted on a population stratified by cost-effective biological biomarkers.

The LETHE solution will be tested in a feasibility study validating the achieved improvements. Upon success LETHE will provide individual-related, specific biomarkers enabling a more personalized risk factor prevention for persons with beginning cognitive decline, thereby empowering people to an active and healthy lifestyle. Expansions of prevention trials on large scale by an a multimodal intervention approach, reaching out to large populations, could save future costs on expensive traditional interventions and confer benefits for the wider society.

In the LETHE project 15 partners from 9 European countries build a platform to store, integrate, analyse and share this sensitive data by nature within the consortium. Data sensitivity affects to all parts of the data pipeline of this platform like data ingestion, unstructured and structured data storing, data processing, AI/ML model processing, AI/ML OPS and data presentation. The LETHE project will also integrate tools and services released by European Open Science Cloud (EOSC).

In this presentation we focus on conceptual architecture of the LETHE, AI solutions as a part of it and secure data management.

Most suitable track

Envisioning the future

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Session Classification: Envisioning the Future - Presentations