FICHE PROJET

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R-MMS

R-MMS aims to bridge this gap by introducing a Software-as-a-Medical Device (SaMD) that offers a real-time, at-home solution for tracking MS progression and treatment efficacy.

Inspiration

Multiple Sclerosis (MS) is a chronic autoimmune disease that affects the central nervous system (CNS), which includes the brain, spinal cord, and optic nerves. MS silently progresses in over 50% of patients, often without visible symptoms, escalating healthcare costs by up to 70%—rising from $30,000 to $100,000 annually per patient. Despite the availability of 25 approved MS treatments, 42% of patients remain undertreated.
Traditional monitoring methods like MRI scans are costly, invasive, and ineffective at predicting treatment responses or disease progression.
Myelin-H SARL aims to bridge this gap by introducing a Software-as-a-Medical Device (SaMD) that offers a real-time, at-home solution for tracking MS progression and treatment efficacy by combining:

- Neuroscience-based cognitive games to engage patients.
- Wearable sensors capture biosignals like EEG, EMG, and speech data.
- A neuromorphic computing engine to interpret data in real time.
- A clinical dashboard to provide actionable insights for healthcare providers.

The device translates biosignals into digital biomarkers and a novel clinical score, enabling physicians to monitor silent disease progression, predict relapses, and tailor treatment plans.

Innovation

In the Remote Monitoring of Multiple Sclerosis (R-MMS) project, LIST joins forces with Myelin-H to improve the state-of-the-art SaMD with enhanced trustworthiness and robustness while complying with the privacy regulations such as the European GDPR in the light of the following objectives:

- Design and implement privacy-enhancing technologies to improve security and privacy
- Clinically validate the proposed SaMD and its effectiveness by demonstrating its accuracy, sensitivity, reliability, and robustness for remotely monitoring MS progression and treatment response across different patients recruited in the proposed multi-site clinical trial.
- Benchmark and compare the novel (home-based) approach with MS gold standard & common clinical practices (MRI, EDSS score, blood tests)

Impact

R-MMS exemplifies how technology can transform healthcare, making it more accessible, efficient, and patient-centered. The project will provide the following outcomes:

- Improved Patient Outcomes: By detecting disease progression early, the SaMD can help delay or prevent disability.
- Cost Efficiency: Reduces reliance on MRI scans, cutting costs for patients and healthcare systems alike.
- Enhanced trustworthiness and robustness: Privacy enhancing technologies to be developed within the scope of R-MMS will help improve the transparency, security, reliability, and robustness of the SaMD in the distributed environments and hence, they will encourage MS patients to use SaMD and benefit from its outcomes.
- Compliance with Regulations: Our Privacy-preserving Federated Learning solutions will enable to operate on multiple clinical sites located in different states such as Italy, Germany, the Netherlands, the UK and the USA while complying with different regulations, e.g., HIPAA, GDPR and the Data Protection Act (UK).
- Environmental Impact: Decreases CO2 emissions by minimizing patient travel for hospital visits.
- Empowered Patients: Encourages active participation in managing their health through gamified assessments.

Partenaires

MyelinH SARL

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