

5 Mobile health and digital phenotyping for personalized health services

Topic 5.1

Topic type: PhD / Post-doc

Abstract

Digital phenotyping refers to the analysis of heterogeneous information derived from personal and wearable devices aimed at characterizing individual human beings and their health status. It can include behavioral patterns, sleep patterns, social interactions, physical mobility, nutrition, cognitive functioning, speech production and many others, depending on the individual health profile. m-health applications, integrated with IoT systems, represent an important data source for digital phenotyping, but they should be also enriched with AI algorithms to automatically detect specific health conditions, risky and adverse situations, and to implement personalized interventions. We are looking for a PhD or Post-doc student who will focus on heterogeneous data analysis and the definition and evaluation of AI algorithms for disease classification, anomalous behavior detection, and early risk prediction, for frail older adults and Parkinson disease. Data related to other users' categories could be analyzed depending on the active projects and available datasets. The activity can also require the development/integration of a m-health prototype with novel wearable sensors and devices to support experimental data collection. AI algorithms should also be integrated in the prototype through on-device machine learning tools to guarantee the processing of sensitive data directly on the personal mobile device. Finally, explainable AI solutions will be investigated to appropriately support the system's output with interpretable motivations. The research will be conducted in collaboration with medical units.

Candidate profile

Candidates should have or about to obtain a MSc degree (for the PhD topic) or PhD degree (for the Post-doc topic) in Computer Science, Computer Engineering, Biomedical Engineering, or closely related disciplines, and a proven track record of excellent University grades (PhD topic) or of publications in relevant top-tier conferences and journals (Post-doc topic). Preferably, the topic of the MSc/PhD thesis should be in one of the relevant research areas (Artificial Intelligence, BigData analytics, distributed systems, e-health applications).

Good written and spoken communication skills in English are required.

Contact

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