

ICT PHD

Research project for a PhD curriculum in ICT – Computer Engineering and Science

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Proposed Title of the research: Big data analytics and prediction techniques for healthy aging to support health-care professionals and self-management in routine care of older people

Keywords: (5)

Big data, data analytics, healthy-aging, machine learning, prediction techniques

Research objectives: --(max 10 rows)

World Health Organization (WHO) is searching for healthy aging tools to support health-care professionals and self-management in routine care of older people.

Healthy aging construct is based on Intrinsic Capacity (IC), defined as the composite of all the physical and mental capacities of an individual divided in 5 domains: locomotion, cognition, psychological, vitality and sensory.

The main research objective of this PhD curriculum is to contribute to the above WHO ambitious goals with big data analytics and machine learning solutions for collections that include a broad variety of (longitudinal) data including genetics, personal health records, patient reported outcomes, lifestyle indicators and wearables.

Proposed research activity -- (max 10 rows)

- Study of data cleaning techniques and application to the datasets;
- Study of the state of the art of data mining and machine learning techniques in the field of healthy aging;
- Exploratory analysis of the datasets and definition of conceptual frameworks for IC domains;
- Study of predictive models to predict geriatric indexes such as the Frailty Index and adverse health outcomes;
- Test of predictive models on geriatric population and analysis of the results;
- New index standardization.

Supporting research projects (and Department)

The project will use data generated by two IRB approved studies: My Smart Age with HIV (MySAwH) and GEPPPO.

Possible connections with research groups, companies, universities.

The study will be conducted together with Prof. Giovanni Guaraldi (Dipartimento Chirurgico, Medico, Odontoiatrico e di Scienze Morfologiche con Interesse Trapiantologico, Oncologico e di Medicina Rigenerativa) at Modena HIV Metabolic Clinic (MHMC), a tertiary level patient centered clinic focused on the assessment of aging in people living with HIV.

(*) optional

(**) optional/to be completed on the second year