Pervasive Sensing-based Social Network Study

Background

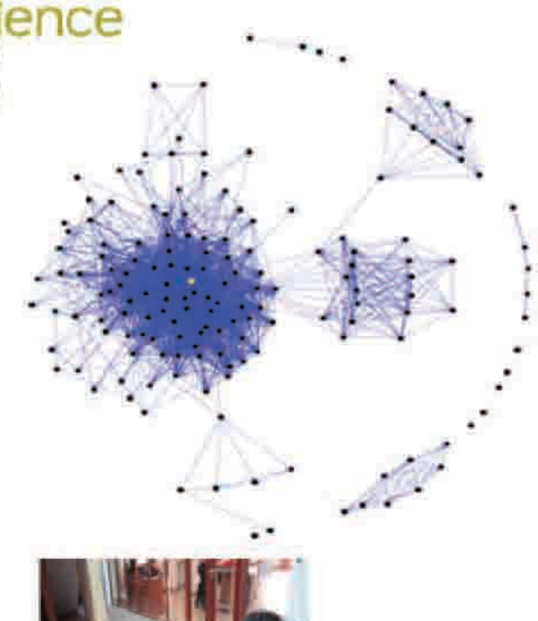
This project aims to design and implement state-of-art pervasive sensing technology to study social network of students and its impact on various academic, social and psychological outcomes, e.g. students' social relations, study habits, learning space design, discourse patterns, problem solving as well as academic outcomes.

Mobile computing platforms will be used to collect information about interactions among students such as location, key words used and length of use in conversations, affective state, language environment, problem solving strategies and discourse patterns.

Innovation in Design Methodology & Practice

1) Psychological Constructs in a Dynamic Social Network

- Mobile phone use can enhance social inclusion as it facilitates the formation and maintenance of social networks
- Despite the proliferation of mobile phone use, the quality of such social interaction and its impact on important outcomes such as emotional well-being, study habits, language use and academic achievement is still largely unknown
- Our project will provide an ingenious way to capture and analyse these behaviours real-time in association with various important social and psychological factors



2) 3D Indoor Localisation

- While GPS-like devices are available to achieve accurate localisation in the outdoor environment, they cannot be used indoor
- Our study will design solutions to map people's physical location in an indoor environment

3) Light-weight Natural Language Processing (NLP)

- Our study will design light-weight NLP to retrieve selective information from conversations without sacrificing privacy, such as extracting information locally and sending back only non-sensitive information, such as key words used, tonal information, etc.

Broader Impact of the Project

The project is a novel approach to measuring psychological constructs, and differentiating and analysing social network in various social / psychological echelons.

The technologies that we develop will have potential applications in many other critical application domains, e.g. location-based advertising, navigation, gaming, disaster rescue, smart indoor battlefields, mobile computing, early childhood education, etc.

Research Opportunities for Undergraduates

Research opportunities are available for undergraduates who are interested in working on this interdisciplinary project that combines expertise from psychology and computer science.

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