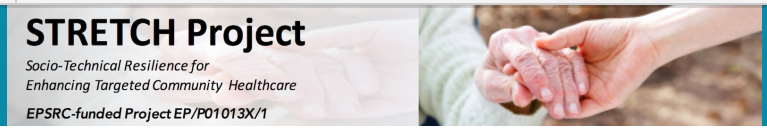


# STRETCH News

August 2017

This is the second newsletter for the Socio-Technical Resilience for Targeted Healthcare (STRETCH) project. The newsletter is sent bi-monthly to communicate with our research partners and collaborators.

Please also see our website https://www.stretchproject.org/ which will be updated as the project progresses.

*Recent Activities*

1. We had our regular project team meeting in London on the 28th of July.
2. We have started a pilot study in Exeter.
3. A privacy elicitation study is being planned for Milton Keynes.
4. Mohammed Bennasar has formally joined the project full-time.
5. Akshika Wijesundara has also joined the STRETCH project as a PhD student.

*A pilot study mapping older people's circles of support*

We now have ethical approval to commence working with 3-5 older people who have a variety of care needs and circles of support networks. With Age UK Exeter, we will work with these volunteers over several months, to understand their personal needs and to suggest social and technical solutions that will help them to maintain independent living at home.
This work will inform the design and implementation of study with a larger group of people (~20) in the next phase of the project, anticipated to start in 2018.

*An elicitation study to understand privacy concerns of older adults*

At the OU we will soon commence conducting an elicitation study to understand privacy concerns of older adults (age 60+ without any serious mobility conditions or severe cognitive impairment) in Milton Keynes. This will involve 5 focus group studies with groups of 4-5 participants who are presented with a set of questions related to their daily routine, privacy and associated safety concerns. The first part of the study consists of questions to be answered individually by the participants and would take 20-30 minutes. The second part of the study consists of questions to be looked upon collectively and would involve moderated discussions. This part would last up to 1 hour. The sessions would be conducted with the help of AgeUK, Milton Keynes.

We are also planning to develop technologies that could be embedded into the daily routine activities of the older adults, could sense important activities and parameters for well being and still remain non-intrusive in nature. One of the examples is having a shoe with pressure sensing grid in the insole and an Accelerometer or GPS sensing unit in the outsole. It would help to measure (a) activity levels, (b) walking styles, (c) falls and (d) whether the older participants went out or not. Users don't need to remember wearing a separate gadget every time as they would wear shoes as a habit.

### *Applying Machine Learning to Healthcare*

In the last newsletter we announced that Mohamed Bennasar will be joining us- this is some more background about his research experience and how he hopes to apply it to STRETCH.

I have been in the area of machine learning, and signal and image processing since 2010, my main research interests are: pattern recognition, and machine learning. I have employed these techniques for health care application; to help clinicians in diagnosing, and monitoring the progression of diseases.

Machine Learning (ML) based systems have become a part of modern life, they are being used for example in mail delivery, reading car plates, search engines, and translators. As a part of my PhD, I developed a computerised clinical decision support system for early detection of dementia based on the clock drawing test. This system uses Artificial Intelligence (AI) techniques to analyse the clock drawings and classify them into: healthy, dementia, or early stage of dementia.  The system achieved high accuracy in diagnosing positive dementia cases.

I worked as a Research Associate in Cardiff University when I developed a system for assessing the progression of Huntington's Disease. The system uses sensors to monitor the movements of the patients during a simple transfer task called money box test. Computer algorithms are deployed to analyse the sensors data and generate a score of the degree of the movement impairment.

Working in the Open University as a part of the STRETCH project will give me very good opportunity to combine techniques of ML and the sensor technology to provide tools that can facilitate healthcare support. ML techniques have the capability to discover the underlying relations between data, and study the significance of each part of the data. ML techniques also can be employed to build decision support tools that can assist the people in the circle of support in making decisions.

### *New Member - Akshika Wijesundara*

Akshika Wijesundara has just joined the STRETCH project as a PhD student where his research will focus on some of the instrumentation of participant homes. Akshika is a graduate from the Department of Computer Science and Engineering, University of Moratuwa, Sri Lanka. His research interests centre around Human-Computer Interaction (HCI), Machine Learning and Computer Vision. Akshika developed his interest on HCI while he was interning at Augmented Human Lab in Singapore University of Technology and Design as a research engineering intern.

Apart from his academic studies he founded Sustainable Education Foundation with the vision to make quality free

education for everyone which is a volunteer run foundation based in Sri Lanka. He has also been a Google Student Ambassador for Sri Lanka acting as the liason between Google and Sri Lanka while he was in the University.

*Plan of Action*

Our plan for the next two months includes:

1. To conduct the Exeter and Milton Keynes pilot studies.
2. To develop "archetypes" of care-recipients and circles of support networks. These can be used as a starting point when working with individuals, and to assist with decisions about what technological solutions are appropriate.
3. To pre-emptively develop outline ethics protocols for different classes of technological solutions, in order to streamline the implementation process.
4. To test some sensor devices and wearables ourselves (e.g. humidity detectors), to determine their usability, appropriateness, and reliability.

Our next project meeting in London is on September 29th.

**STRETCH Project Website**

If you have any feedback for us, or would like to get in touch, please email info@stretchproject.org.

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