**Fall detection and activity monitoring at home**

With the growing ageing population and preference for prolonged personal independence, smart home technology and telecare has gained substantial popularity.

The PhD focuses on detecting user status at home or residential care settings using commercially off the shelf technology. It uses machine learning algorithms to classify and detect resident activities and events of interests including falls. The research is linked with local residential care enterprises and North Hertfordshire County Council, and benefits from cross disciplinary supervision between the School of Computer Science and the Centre for Research in Primary and Community Care at the University.

Technologies available include fisheye ceiling cameras, contact sensors, Kinect and RGB-D cameras, wireless range and position sensors, to name a few.

**Sensing user input in HRI using information theory**

Perceiving sensory information better allows us to provide more personalised human-robot interaction. An area of interest is to provide a mechanism where human and robot inputs can be separated towards personalisation and better control. The focus of this PhD is to utilise information theory to better sense user inputs during interaction and to provide a better sense of being in control, or empowerment. This is then used to alter conventional control paradigms such as impedance and admittance control, to provide a more personalised control. HapticMASTER robot as well as EMG and EEG systems are available for use within this PhD. The outcome has application in general HRI but specifically useful for unsupervised therapeutic interaction with robots after stroke.

**Requirements:**

Applicants should have a very strong first degree or (preferably) a Master's degree in Cybernetics, Computer Science, Biomechanics or other relevant area, and are expected to have strong interdisciplinary interests (e.g. in robotics, rehabilitation, neuroscience). They are also expected to have very good programming skills and interest in robotics.

The PhD will be conducted under Dr Farshid Amirabdollahian’s supervision and candidates are invited to informally contact f.amirabdollahian2@herts.ac.uk.