

Human-Robot Manipulation and Co-Operation  
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A new generation of interactive robots are currently being deployed in tasks where the robot must work interactively and co-operatively with humans. Unlike previous industrial type robot manipulators, these new robots are designed to work safely alongside, interact and co-operate with humans. However, although now intrinsically safe for humans to interact with, there still remains the problem of how can the robots co-operate acceptably and effectively with human partners and team members? Also, there are still many technical issues to address in the specific area of robot manipulation fitted with compliant effectors, in order that they can be more generally useful and applicable to a wider range of manipulation tasks than is possible at present. The Adaptive Systems research group at the University of Hertfordshire is currently one of the world's top research teams in the area of Human-Robot Interaction (<http://adapsys.stca.herts.ac.uk/>). The group has contributed to a number of international EU projects, for example COGNIRON (COGNitive Robot CompaniON, <http://www.cogniron.org/final/Home.php>), LIREC (LIving with Robots and intEractive Companions, <http://lirec.eu/>) and ACCOMPANY (ACceptable robotics COMPanions for AgeiNg Years, <http://accompanyproject.eu/>). The group works with a number of robots (iCUB, care-o-bot3, KASPAR, Sunflower, and others), including both commercial and in-house produced platforms.

The group has recently purchased a state of the art Baxter robot from ReThink Robotics (<http://www.rethinkrobotics.com/products/baxter/>), and we would like to appoint a PhD student who will have the opportunity to work with this robot on a suitable PhD project. The PhD project will be devoted to the research and development of novel methods and strategies to enable the Baxter robot to work interactively and co-operatively with a human partner. The research team at University of Hertfordshire have pursued this research direction for more than 15 years and has a significant track record in this area. Depending on the appointee's interest, abilities and experience, the project may be orientated more either towards the technical development or human-centred aspects of human-robot interaction and co-operation. However, in either case, it is envisaged while technical development of software and hardware will be a major focus of this work, the design, preparation, implementation and analysis of human-robot interaction experiments will also be necessary. Although the PhD student will be responsible primarily for their own area of research, at times they will also necessarily work as part of a larger research team working on human-robot interaction.

Applicants are required to have a strong first degree or Master's degree in Computer Science, Robotics or a related area relevant to the project. Excellent programming skills are essential including Python (essential) and (desirable) C++ and/or experience of using ROS. The ability to interface robot sensors and

to develop software on robots is a necessary requirement of this studentship, as well as a general interest in interdisciplinary research and a willingness to collaborate with researchers from other disciplines. An additional background in human-robot or human-computer interaction is also highly desirable. The ideal candidate will be self-motivated with good writing and communication skills. The PhD will be supervised by Dr. Michael Walters ([M.L.Walters@herts.ac.uk](mailto:M.L.Walters@herts.ac.uk)), whom interested candidates are invited to contact via email in the first instance. Note, all applications must be made formally via our Research Office as specified in the advert.