FindAPhD Project Template

Department Name:

| Department of Computer Science |

Supervisor(s) and their email address (2 max):

| Dr. Shan Luo (shan.luo@liverpool.ac.uk) Dr. Paolo Paoletti (p.paoletti@liverpool.ac.uk) |

Funding Status (select from below drop down menu):

| Directly Funded Project (UK/European Students Only) |

Application Deadline:

| 30th June 2018 |

Project Title:

| Feel the Fabrics: Robotic Manipulation of deformable objects with Touch Sensing |
Project Description (max 700 words):

We have a fully-funded, 3-year PhD studentship available at the Department of Computer Science, University of Liverpool, starting from September 2018. We are seeking a highly creative and motivated applicant with a keen interest in doing research in robot perception and manipulation, using machine/deep learning and computer vision techniques. The PhD studentship will be supervised by Dr Shan Luo, Dr Paolo Paoletti and Prof. Michael Fisher.

This project aims to develop techniques for the manipulation of fabrics using robot manipulators embedded with tactile sensing. Robot manipulation has been widely applied in industry for tasks such as warehouse operation and assembly. Research on robot manipulation has mainly focused on handling rigid objects so far. However, many important application domains require manipulating non-rigid or flexible objects such as fabrics, hoses and cables. Such objects are far more challenging to handle, as they can exhibit a much greater diversity of behaviours. The challenges involved, such as sensing capabilities (touch sensing and robot vision), perception of object properties and manipulation planning, need to be addressed to unlock the full potential of robot manipulation. This project will directly address these challenges by blending ideas coming from different disciplines including robotics, machine learning and computer vision. It is expected to create a robotic system to manipulate the fabrics autonomously, leveraging perception and learning through interaction. The project will be linked to the EPSRC Productive Nation strategic priority outcome and creates case studies for the Factories of the Future.

Requirements:

- A 1st or 2.1 degree in an engineering discipline or computer science
- Solid background in computer programming (for example, Python, C++, Matlab)
- Proficiency in spoken and written English
- (Preferred) Previous coursework and/or practical experience in machine learning, especially in the deep learning libraries (Tensorflow, Torch etc.)
- (Preferred) Previous coursework and/or practical experience with ROS and robot platforms
- (Preferred) Solid background in mathematics

We offer:

- You will work at one of the world leading universities, and have the opportunity to work towards your PhD with a group of excellent scientists in Robotics
- You will receive funding from the EPSRC Doctoral Training Programme for the standard minimum stipend (in 2018/2019 this is £14,777) and fees up to a Home/EU rate.
- Access to robot facilities in the lab (e.g., a URS robot arm, a 3-finger adaptive Robotiq gripper and many other robot platforms)
- Collaboration opportunities in both academia (we have been in collaboration with a MIT group who develop GelSight touch sensors) and industry (potential placements at Unilever)
The University of Liverpool is one of the world leading universities that is a founding member of the Russell Group and has nine Nobel Prize Laureates amongst its alumni and past faculty. The Department of Computer Science is renowned internationally for excellent research in the areas of Algorithms and Artificial Intelligence. The Department has recently increased its laboratory facilities for research on robotics and excellent research has been produced at the state-of-the-art robotics laboratories the Centre for Autonomous Systems (CAST) and the smARTLab within the Department.

Funding Notes (max 100 words):

For enquiries on the application process or to find out more about the programme please contact eecspgr@liverpool.ac.uk. The deadline for application is 30th June 2018.

Qualified applicants are strongly encouraged to informally contact Dr. Shan Luo (shan.luo@liverpool.ac.uk) to discuss the application prior to applying.

Name and email address to direct enquiries to:

Funding from the EPSRC Doctoral Training Programme for the standard minimum stipend (in 2018/2019 this is £14,777) and fees up to a Home/EU rate.

Application Web Page:

Tel. No. for Enquiries:

https://www.liverpool.ac.uk/study/postgraduate-research/how-to-apply

List of subject areas (please select the appropriate subject areas the project applies to):
Engineering
- Acoustics
- Aeronautical Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil & Structural Engineering
- Electrical & Electronic
- Energy
- Manufacturing
- Materials Science
- Mechanical Engineering
- Nanotechnology
- Nuclear Engineering
- Semiconductors
- Software Engineering
- Telecommunications

Maths & Computing
- Applied Mathematics
- Bioinformatics
- Computational Chemistry
- Computer Science & IT
- Data Analysis
- Information Science
- Mathematics
- Operational Research
- Software Engineering
- Statistics

Humanities
- American Studies
- Anthropology
- Archaeology
- Architecture & the Built Environment
- Asian Studies
- Classics & Ancient History
- Communication, Cultural & Media Studies
- European Studies
- Geography
Analytical Chemistry
Biochemistry
Chemical Engineering
Chemical Toxicology
Computational Chemistry
Electrochemistry
Environmental Chemistry
Food Chemistry
Geochemistry
Inorganic Chemistry
Macromolecular Chemistry
Materials Science
Organic Chemistry
Pharmaceutical Chemistry
Physical Chemistry
Synthetic Chemistry

Physical Sciences
Applied Physics
Astrophysics
Atmospheric Physics
Atomic Physics
Biophysics
Condensed Matter Physics
Fluid Dynamics
Geophysics
Low-temperature Physics
Materials Science
Medical / Biomedical Physics
Metrology
Nuclear Physics
Optical Physics
Particle Physics
Plasma Physics
Radiation
Semiconductors
Theoretical Physics
Earth Sciences

- Agronomy & Soil Science
- Atmospheric Physics
- Climatology & Climate Change
- Ecology & Conservation
- Ecotoxicology & Pollution
- Environmental Chemistry
- Environmental Science
- Geochemistry
- Geography
- Geology
- Geophysics
- Hydrology
- Meteorology
- Oceanography