PhD projects in the Department of Engineering

The PhD proposals listed below will be considered for 2023/24 studentships available in the Department of Engineering to start 1 October 2023 or later during the 2023/24 academic year. 1 June 2023 start is also possible in some cases.

The PhD projects are listed in two groups. In the first group are projects which can be considered for available scholarships. Please note that the list of projects is not exhaustive. Potential applicants can identify and contact appropriate supervisors outlining their background and research interests or proposing their own project ideas. Possible supervisors and their contact details can be found in the departmental website.

Applications for the projects in the first group, as well as any other projects agreed with supervisors are welcome also from students applying for other studentship schemes and from self-funded students.

Projects in the second group are the projects with associated studentships: each project in this group has one allocated studentship for a home student.

Group 1: Projects for the available studentships

- Task-oriented Semantics-aware Communications for 6G (Dr Yansha Deng)
- Research in the following areas: 1) Battery safety (fire, thermal management, degradation); 2) Fire Dynamics (wildfire, built environment, and electrical fires); 3) bioenergy (reactivity of biomass, biochar, and ignition characteristics); 4) hydrogen (pyrolysis, conversion, safety) (Dr Francesco Restuccia)
- Robot visual-tactile sensing and learning in robot grasping tasks (Dr Shan Luo)
- Improving the generalization ability of robot perception and skill learning from simulation to the real world (Dr Shan Luo)
- Dynamic modeling and robot tool use of objects with complex physical properties (Dr Shan Luo)
- To develop hybrid physics-based and data-driven modeling based on optimisation theory and machine learning algorithms; explore new application areas e.g. bioprocess diagnosis and optimisation, microbial synthesis for waste-to-protein, novel molecule discovery (Dr Miao Guo)
- Fluid dynamics problems in renewable energy systems (Dr Juan Li and Dr David Moxey)

- AI-guided consumer-centric domestic energy decarbonisation using low-carbon technologies   (Associate Professor Wei He)
- Development of sustainable batteries (Dr Laura Lander)
- A series of PhD projects on the properties of materials and their degradation are available. Topics range from the effects of environmental changes on the stability of paintings with the Courtauld Gallery to optimising the functional/mechanical properties for engineering applications (Professor Barbara Shollock)
- Wearable sensors for health monitoring (Dr Ernest Kamavuako)
- Investigation of Design for Environmental Sustainability - A study on the perceptions of environmental sustainability factors during New Product Development (Dr Wei Liu)
- Design for Circular Economy: A Decision- making tool for Early Design Stage to achieve circularity in Packaging Industry ((Dr Wei Liu)
- A superconducting brushless exciter for high-power density electrical machines (Dr Mark Ainslie)
- Immersive audio for XR (Professor Zoran Cvetkovic)
- Enhancing the superconducting performance of MgB2 (Dr Tayebeh Mousavi)
- Reliable decentralized AI over wireless channels (Professor Osvaldo Simeone)
- Robot Learning from and for Interactions with Humans (Dr Oya Celiktutan Dikici)

Group 2: Projects with allocated PhD studentships

- [Fluid mechanics in bio-inspired flight/swimming and renewable energy systems (Dr Juan Li, Dr David Moxey)](#)
- [Developing high-fidelity fluid dynamics simulations for sustainable aviation (Dr David Moxey)](#)
- [Design of High-Performance Electrode Materials for Sustainable Non-Aqueous Aluminium-Ion Batteries (Dr Laura Lander)](#)
- [Manufacturing and characterization of high-field MgB2 bulk superconductors doped with new additives (Dr Tayebeh Mousavi)](#)
- [Consumer energy decarbonisation and energy poverty mitigation (Associate Prof Wei He)](#)
- [A superconducting brushless exciter for high-power density electrical machines (Dr Mark Ainslie)](#)
- [Digital Music Therapeutics for Precision Cardiovascular Medicine (Prof Elaine Chew)](#)
- [Engineering Networked Machine Learning via Meta-Free Energy Minimisation (Prof Osvaldo Simeone)](#)