Research in Engineering Mathematics

Our academics and postgraduate research students are leading the way in many research areas, often as part of interdisciplinary collaborations with industry and other institutions.

Complex collective behaviours and control
Collective behaviour is all around us, ranging from road traffic to the interactions of the cells within our bodies. Our expertise in mathematical modelling allows us to describe, predict and ultimately control these complex behaviours.

Nonlinear dynamics and chaos
Nonlinear interactions are increasingly important in engineering, particularly with the drive towards lightweight, efficient structures and novel materials which often exhibit pronounced nonlinear behaviour. Our researchers are developing cutting edge techniques to harness and exploit these effects.

Intelligent systems
Machine learning and artificial intelligence is undergoing a renaissance driven by the availability of data. Engineering Mathematics is at the forefront of developments for discovering structure in big datasets, ranging from social networks to next-generation DNA sequencing and the analysis of music.

Robotics
Robotics is the fastest growing industry in the world and poised to become the largest industry in the next decade. In Engineering Mathematics we have world-leading expertise in tactile perception, soft robotics and swarming robots for applications in healthcare, virtual reality, environmental monitoring and remediation.

Biomedical applications
More and more biologists and doctors need quantitative approaches for data analysis, diagnosis, and development of innovative treatments. We use mathematical modelling and bioinformatics to tackle biological systems complexity, identify mutations leading to disease and engineer novel functions in living cells.