

Mechanical Engineering Research Group

Mechanical and aeronautical engineering experts

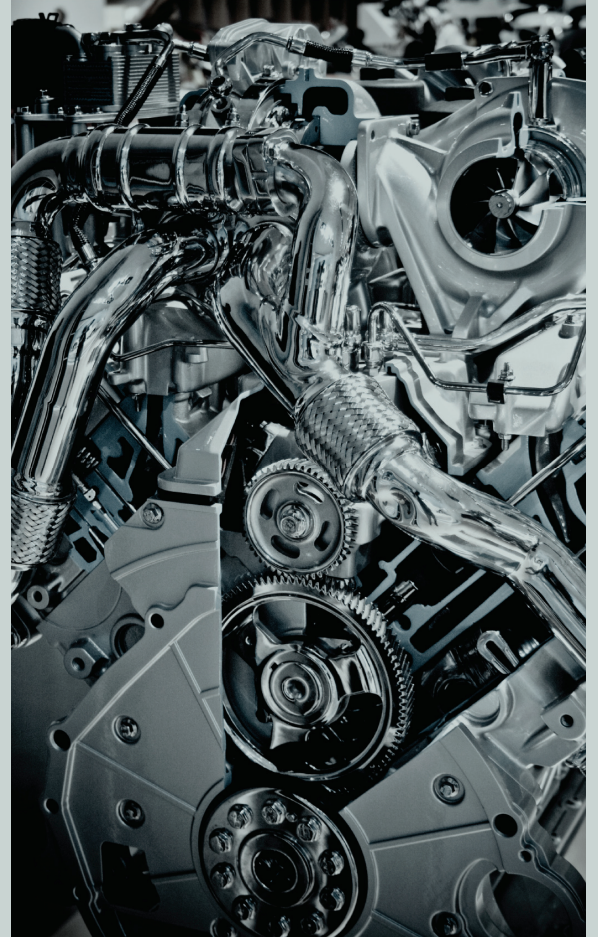
The **Mechanical Engineering Research Group (MERG)** conducts research and provides business consultancy in a number of areas within the mechanical and aeronautical engineering sectors. The unique combination of skills and experience allowed the group to establish successful collaborative links with research organisations and other universities worldwide.

Mission

The MERG aims to provide solutions to fundamental and applied problems by undertaking leading-edge research in Mechanical and Aeronautical Engineering areas.

Background

The MERG is well established consisting of a number of researchers with world class expertise in the above areas of activity. The group has an impressive list of publications and success stories working with industry in UK, Europe, China and India.



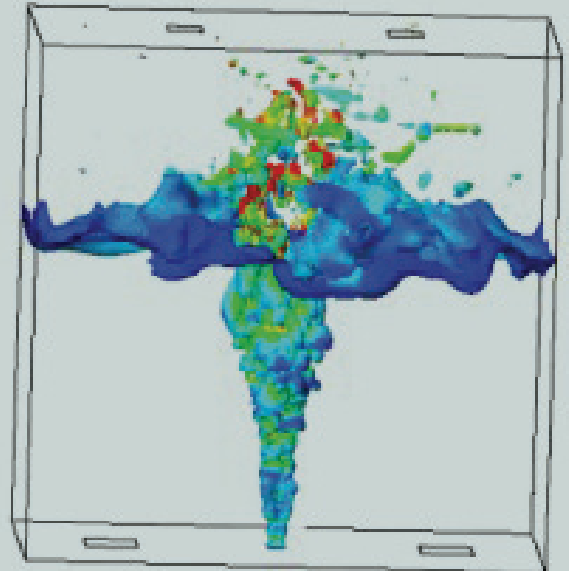
Expertise

The MERG's key areas of expertise include:

- Combustion modelling and energy conversion research using both experimental and CFD methods to analyse efficiencies and emissions of energy systems
- Computational rheology, non-Newtonian biofluid simulations and viscoelastic effects on lubrication thin film flows
- Surface engineering via surface modification of materials for enhancement of mechanical, tribological and chemical properties
- Nonlinear flight mechanics, developing computational flight clearance methods, software and phenomenological modelling of high incidence unsteady aerodynamics

Facilities

- The state-of-the-art laboratory for material research and surface engineering
- The fully instrumented, purpose-built engine testing facility to analyse engine performance parameters and emission data
- Access to high performance computational clusters and licensed commercial Computational Fluid Dynamics (CFD) software packages. The group have developed in-house efficient computational methods, algorithms and software for solving complicated fluid dynamics and flight mechanics problems



Mechanical Engineering Research Group can offer businesses:

- Material science and surface engineering
- Aerodynamics and flight dynamics
- CFD and experimental studies for modelling non-Newtonian flows, internal combustion and alternative fuels

Key Collaborations

Academic

- Loughborough University
- University of Bristol
- Xiantang University (China)
- Kwame Nkrumah University (Ghana)
- Nanjing University of Aeronautics and
- Aerospace (NUAA) (China)

Industrial

- Central Aerohydrodynamic Institute (TsAGI) (Russia)
- National Aerospace Laboratories (Bangalore, India)
- Institute of Non-Newtonian Fluids (Aberystwyth)

Research Grants and Projects

- Numerical and Experimental Studies of the Combustion of Biofuels on Different Platforms (EMDA)
- Simulation of Upset Recovery in Aviation, EU FP7 “SUPRA” (www.supra.aero)
- Aerodynamic Model Extension and Validation beyond Normal Envelope (NAL, India)

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