DE MONTFORT UNIVERSITY LEICESTER

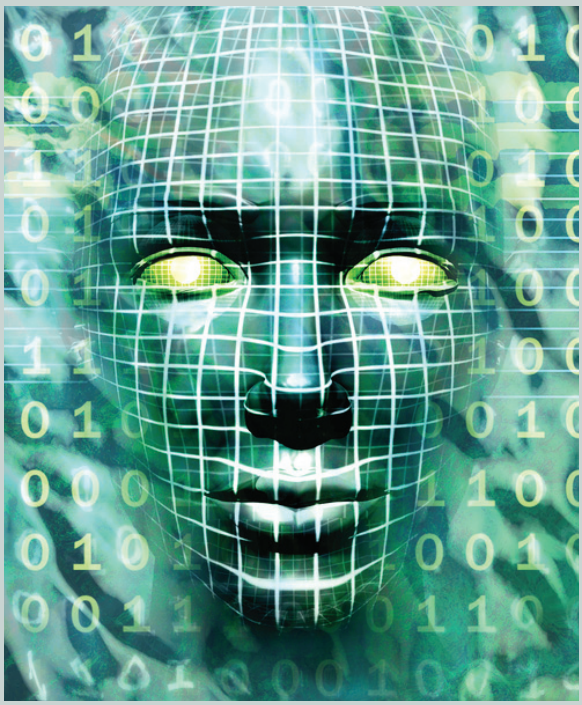
YOUR CHALLENGES + OUR EXPERTISE = INNOVATIVE SOLUTIONS

Centre for Computational Intelligence

Inventing and exploiting computational intelligence techniques to address organisational issues.

The **Centre for Computational Intelligence (CCI)** exists to develop fundamental theoretical and practical solutions to real world problems using a variety of computational intelligence paradigms.

This centre produces high quality, industrially relevant research into intelligent systems. This provides theoretically sound solutions to real world, decision making and prediction problems. With an established international reputation, its work focuses on the use of fuzzy logic, artificial neural networks, evolutionary computing, mobile robotics and biomedical informatics. CCI offers a number of benefits to the data management, defence, health, logistics, security and video gaming sectors.



Mission

- To be one of the leading national and international sources of expertise on fuzzy logic, data mining and biomedical informatics
- To play a key role in enabling the University to develop an international reputation for leading edge computational intelligence research

Background

The Centre has been in existence since 1995. Throughout these years it has had a consistent strategy of only carrying out strong fundamental research with quality publications, knowledge transfer and industrial relevance being our primary purpose. We have grown to a substantial size with a large core of staff and PhD students working in neural computing, fuzzy logic and evolutionary computing.

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Expertise

CCI covers a diverse range of computational intelligence areas including:

- Bespoke embedded hardware and software solutions
- Crowd models and simulations
- Intelligent systems for video games
- Intelligent web systems
- Supply chain modelling
- Video analytics
- Intelligent Transport Systems
- Eye Gaze: a unique assistive technologies solution
- Data mining

Facilities

The CCI robotics platforms offer cost-effective opportunities to test out hardware, software and algorithms in a range of controlled environments. The group's extensive knowledge of experimental methods makes it an ideal partner for such testing.

The Centre for Computational Intelligence can offer:

- Improved decision making, whether in planning, forecasting or in a real-time situation
- Advanced modelling techniques. Computational Intelligence paradigms are well known for their ability to model processes and concepts not effectively expressed by traditional mathematical techniques
- Efficient optimisation of large, complex, non-linear problems. A number of the techniques used can optimise complex processes and control parameters

Key Collaborations

Academic:
- Nottingham University
- University of Granada
- Essex University
- University of Southern California

Industrial:
- Trelleborg Industrial AVS
- Unipart Logistics Ltd
- Preactor International Ltd
- Rolls Royce

Research Grants and Projects

The main research project topics that are ongoing in the centre are:

- Theory of artificial intelligence: Perception based systems
- Intelligent agents and mobile robotics: Online path optimisation using self simulation and genetic paradigm, collaborative robots, cognitive robots
- Biomedical applications of AI: Analysis of developmental genetics theory using evolutionary programming
- Behaviour modelling, simulation and forecasting: based on analyses and correlation using uncertain, disparate and multiple sources of information in complex systems (e.g. consumer behaviour)
- Type-2 fuzzy logic
- Eye gaze
- Fuzzy medical systems: Early diagnosis of confusable diseases

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