

## Computer Science Research at Heriot-Watt University: 1980-2003

Following the appointment of Prof Howard Williams as HoD in 1980, CS's active participation in the UK "5th Generation" Alvey programme led to substantial growth in research, building on established work in databases, graphics and software engineering. Intelligent Knowledge Based Systems activity included the use of logic programming in databases and its support by hardware. This was complemented by Prof Fred Heath's development of hardware for free text retrieval, after he joined CS from EEE in 1983. "IKBS" is still celebrated in the stained glass over the main entrance to the University. Innovative research in Human Computer Interaction explored adaptive user interfaces. CS also co-hosted the Scottish HCI Centre with Strathclyde University, which sought to transfer HCI practise to industry.

In the 1980's, research growth was further consolidated by the appointment of new staff. Dr (now Prof) Andy Wallace established Computer Vision research, investigating low and high level machine vision and their relationships to human perception. HCI research was strengthened by the appointment of Prof Alistair Kilgour with expertise in interactive system design. Dr (now Prof) Alex Gammerman augmented machine learning and expert system activity through the application of advanced statistical techniques. In the late 1980's, SERC support provided a reconfigurable parallel system which was applied to vision and graphics research, bridging established activities with emerging interests in formally motivated software development

This sustained UK funded activity was reflected in the introduction of new advanced MSc programmes in Knowledge Based Systems and Human Computer Interaction, with SERC support. These proved fertile sources of strong PhD students and research staff. The early 1990's also saw growing European funded activity, with major projects in tele-medicine, deductive databases, statistical expert systems and large image terminals. In this period, CS recorded one of the highest levels of research income per member of staff in the UK. In 1992, the cognate area of CS received a 3B in the Research Assessment Exercise, reflecting research at UK levels in most areas and International levels in some.

While the 1992 move to Riccarton from the Grassmarket, and the merger with EEE to form Computing and Electrical Engineering, proved initially traumatic, research was not adversely affected. Indeed, good synergy was exploited in the areas of intelligent systems and evolutionary techniques, and computer vision and image processing. New activity was also initiated with TLTP and JISC support in Computer Based Learning, complementing ICBL activity, and in Internet Applications, especially information visualisation. There was also consistent funding in established areas, supporting novel research in active and multi-media databases, and 3D vision. In the 1996 RAE, CS improved its grade to 4B. The 1992 merger also led to the integration of the former Departments' MSc programmes, and the subsequent relaunch of the KBS and HCI MSc courses as Distributed and Multi-Media Information Systems and Interactive Multi Media respectively, as well as new MScs in Bioinformatics and Computer Based Learning.

The late 1990s saw the appointment of new staff with funded activity in automatic theorem proving, parallel and distributed functional programming, natural language generation, software engineering and information systems. Dependable Systems research, which integrated much of the Department's formally motivated software engineering activity, was strengthened with the 1998 appointment of Prof Rob Pooley, working on system modelling. Prof Fairouz Kamareddine's 1998 appointment initiated research activity into the Foundations of Computing, focusing on logics, term rewriting and type systems. As well as substantial continuing UK and EU support for new initiatives in the well established areas of Data and Knowledge Base Systems, Computer Vision and HCI, this period also saw further collaboration on Interactive Media with the University's Learning Technology Centre, and new research in Bioinformatics with BBSRC support. In 2001, the CS cognate area again improved its RAE grade, achieving a 4A.