About the School of Computer Science

Computer Science at Birmingham dates back to the late 1950s; one of the first academic departments in the UK to undertake research and teaching in this field.

Some 50 years later, we now provide specialist teaching and conduct world-leading research in fundamental and applied computer science, artificial intelligence, optimisation, computer security, medical imaging and robotics. We deliver outstanding education that offers a range of exciting career opportunities for students from around the world.

The School of Computer Science at University of Birmingham has consistently been ranked in the Top 10 in UK league tables. In 2013 the School achieved an overall satisfaction rate of 95% (NSS 2013) and **The Guardian University Guide 2014 (http://www.guardian.co.uk/education/table/2013/jun/04/university-guide-computer-sciences-it)** ranked University of Birmingham first place out of 128 in the UK league table for Computer Sciences and IT.

What is Computer Science?

Computers are a core part of our lives: social networking, media streaming, computer games, office applications and online shopping are all obvious examples of things that computer science has brought us that many people are very familiar with. It is a popular view that Computer Science is about developing and building new and improved consumer products and technologies, and of course it has a vital role to play in this area: computer science is at the heart of 21st century commerce and industry, with almost every business using computers in some way. Large businesses will often devote a substantial proportion of their operating budget to the development of computer systems that aid in the management of the company; for example, by keeping track of stock levels or managing delivery schedules.

But Computer Science is about so much more than this: at its most fundamental level, it is about information and how to represent, store, communicate, manipulate, understand, and make use of it. This can have a far more significant impact than the use of computers to perform comparatively simple housekeeping tasks.

Computational Thinking

Information is a tremendously valuable commodity, and there is a vast industry dedicated to making sense of it: from generating adverts specific to your interests on social networking sites to identifying trends in financial markets. Computer Science is at the heart of this industry. The role of the computer scientist in this process is not just about writing computer programmes to perform a particular task (although this can be a significant part of what computer scientists do), it is about developing new ways of thinking about information, and what you can do with it. This can have a profound impact on other areas of science and engineering, and also on the humanities, social sciences and business. Thinking about problems from a computational perspective is leading to fundamental new insights in other areas and allows us to:

- Extract the crucial features from very large datasets such as those generated in the search for the Higgs boson at the Large Hadron Collider.
- Use computer simulations to work out how the flocking behaviour of birds emerges from the actions of intelligent individuals.
- Develop new designer drugs for cancer.
- Understand how the brain works, through the analysis of artificial neural networks, and by drawing on our knowledge of information processing to formulate a “Computational Theory of Mind”.
- Analyse data from social networks and mobile systems in order to understand the movements and motivations of people.
- Model and analyse business processes to understand how to improve the efficiency of a company's operations.

So, at its most fundamental level Computer Science is about understanding, analysing, and designing information processing systems. This is a complex multi-faceted process that can involve mathematical analysis, engineering, human factors and ethical considerations.

A Computer Science degree could lead to a tremendous variety of careers: you could be helping to develop the next generation of social networks; writing a sophisticated motor racing game (or even a Formula 1 simulator); working out the structure of proteins; developing software for financial trading; predicting the weather; modelling the effect of brain injuries, amongst many, many other possibilities. The proliferation of information, and the pressing need and desire to understand it will only lead to an increase in the demand for skilled computer scientists to develop new ways of thinking.