# women@CL

**Professor Jane Hillston**

Reader, School of Informatics and Centre for Systems Biology, University of Edinburgh

Professor Hillston has both a BA and an MSc in Mathematics, awarded from the University of York and Lehigh University (Bethlehem, Pennsylvania) respectively. She originally considered a career in accountancy, but during her time with a software company she discovered her interest in computing. It was then that she decided to study for a PhD in Computer Science at the University of Edinburgh. Her thesis, 'A Compositional Approach to Performance Modelling', won a Distinguished Dissertation Award.

Hillston has stayed in Edinburgh and is now a Professor in the School of Informatics, she currently holds an EPSRC Advanced Research Fellowship (2005-2010) and so spends most of her time on research. Prior to this Dr Hillston was a Lecturer in the Department of Computer Science. Despite concerns that working part-time would affect her research career, it has in fact blossomed with the support of an outstanding team surrounding her, giving her the space and time to think around the problems. Dr Hillston was the winner of the Roger Needham award in 2004 for her work in the new software modelling language, PEPA (*Performance Evaluation Process Algebra)* and was elected a Fellow of the Royal Society of Edinburgh in 2007.

It is often difficult to predict how well a computer system will "perform", for example, how quickly it will satisfy user requests or how many it can process in any given time. Hillston's research develops techniques to help people make such predictions and use these predictions to compare design alternatives in a quantified way. She has developed a description language which is related to formal languages and process algebras used to verify that computer systems behave correctly. By modifying the language to capture timing information, she is able to develop a formalism which bridges system verification and performance modelling based on mathematical models called Markov processes.

These PEPA models are used in many different areas, such as shipping modelling and behaviour modelling in telecommunications looking at the impact of standard traffic in active switches.

At present, she is focused on the problem of modelling biochemical pathways within cells. Advances in genomics and proteomics have meant that biologists have a large volume of data and are starting to develop models of the processes which make our cells work the way that they do. These processes consist of

many interacting components, which operate concurrently - features which are shared by the computer systems. Dr Hillston has been developing techniques to model such processes. A current challenge is to investigate the extent to which existing system description languages can be used to represent biological systems, and to assist biologists in developing new description techniques. This is an area that Dr Hillston is working closely with another Women@CL member, Dr Muffy Calder.

As well as being an active member of women@CL, Dr Hillston is also a Steering Committee member for the International Conference on Quantitative Evaluation of Systems (QEST) and a member of UKCRC.

When Dr Hillston is not working she enjoys spending time with her husband and two daughters, Martha and Alice, cooking, entertaining and gardening.

http://homepages.inf.ed.ac.uk/jeh