Indian Institute of Science
Bangalore 560 012

Centenary Lecture

What is Engineering ?

Date	:	**14 December 2009**
Time	:	**4.00 pm**
Venue	:	**Faculty Hall**

Presided by Prof P Balaram, Director

Speaker : **Prof Ross Anderson, FRS**
University of Cambridge

We humans are now building complex socio-technical systems of a kind never been seen before. Complex software is linking thousands of firms and millions of people into infrastructure systems on which we are all coming to depend. Examples include the Internet, the world card payment system, and regional smart grids for distributing electricity. The world has seen large organisations before - from armies through the civil service to religions - but the complexity brought by software is something quite new. Even systems designed for entertainment, such as Facebook and Orkut, are becoming part of the fabric of people's lives. And as human life moves online, so the online world starts to reflect the world's many problems, with crime, conflict and assorted system failures.

How can we make complex socio-technical systems dependable? This is not just a research question, but an important practical and policy matter. The answers involve not just traditional computer science but also economics, systems biology and psychology. We need to design systems where stable equilibria emerge from the self-interested striving of multiple stakeholders. These systems must also be capable of evolution if they are to be robust in the face of changing circumstances. Finally they have to be usable: they must flow with the grain of human nature.

Systems engineering presents many exciting research challenges that cross over between computer science, economics and other disciplines; and it is often at boundaries between disciplines that big advances can be made. It also raises interesting questions about how we should educate the next generation of engineers, and indeed about how we should define our own discipline.

Prof Ross Anderson http://www.cl.cam.ac.uk/~rja14/Papers/cv.pdf
Professor Anderson is an international expert on Security Engineering. He is a Professor at the Computer Laboratory, University of Cambridge. His research topics include: Economics of information security – including security topology and psychology; Peer-to-Peer – including the Eternity Service, cocaine auctions and suicide bombing; Reliability of security systems – including bank fraud and fraud and hardware hacking; Robustness of cryptographic protocols - including API attacks; Analysis and design of cryptographic algorithms - including Tiger and Serpent; Information hiding - including Soft Tempest, stego file systems and Stirmark; Security of clinical information systems - including NHS databases; Privacy and freedom issues - including FIPR and `Trusted Computing'. He chairs the Foundation for Information Policy Research. He has written more than 170 research papers and the well known book *Security Engineering*: *A Guide to Building Dependable Distributed Systems*, Wiley. He is a Fellow of the Royal Society London and of the Royal Academy of Engineering, and has been recognized by various awards.

All are welcome

Tea: 5.15 pm, Reception Hall