

Computing for the Future of the Planet

By Prof Andy Hopper

The Cirencester Science and Technology Society's 2015 public lecture addressed the broad theme of the relationship between the likely developments in digital technology and the sustainability of the planet. Professor Hopper divided this broad framework into 4 main components. These involved the development of optimal digital infrastructure or what he termed "green computing", sensor based digital modelling or "computing for green", reproducible computing and the ability of cyberspace to aid in wealth creation.

The lecture provided numerous examples of green computing that included huge improvements in the proportion of energy actually used for the computing process that has risen from around 50% only a few years ago to nearer 90% in some cases now. Other examples cited related to energy proportional computing, the application of renewable energy, and moving computing activities to areas of "free" energy, otherwise termed "free lunch computing". Hopper foresees a future with more energy proportional computing making the best use of surplus energy.

The second topic of the talk, "computing for green" dealt with the use of sensors for a vast range of applications with examples covering the external measurement of heat loss from buildings and communities to the development of indoor located sensors and tags applying the equivalent of "indoors GPS". Among many other actual and potential uses of tagged applications are the widespread use of highly sophisticated tagged tools employed in the motor and aerospace industries and trials with smartphone type tracking devices in supermarkets.

In the third section of his lecture, focusing on prediction and reaction, Andy Hopper touched on ways in which the industry is dealing with the problem of data provenance, security and ways of removing unwanted or erroneous information.

In an information packed talk there was little time for him to do more than touch briefly on the opportunities for digital technology to raise wealth in the wider sense. He gave examples of the rapid development of smart phones in Africa that have brought online banking and transactional capabilities directly to large numbers of farmers, traders and others in the developing world. In India the rapid growth in cellular technology has resulted in "Uber-rickshaw" applications and worldwide there is the growing potential for massive online teaching systems. He left the audience somewhat dazed but also impressed by the huge potential for further massive growth in computing applications.