



Personnel

As at the beginning of October 2013 the Computer Laboratory consisted of 152 members of staff:

Academic staff	41
Academic-related	10
Assistant staff	15
Research Fellows	5
Post-doctoral Researchers	81

Five members of staff enjoyed personal promotions from October 2013: Dr Pietro Lio to a Readership in Computational Biology, Dr Frank Stajano to a Readership in Security and Privacy; and Dr Alastair Beresford, Dr Robert Harle, Dr Robert Mullins and Dr Andy Rice to Senior Lectureships.

Two new Lecturers were appointed in 2013: Dr Thomas Sauerwald, previously at Max Planck Institute for Informatics and Dr Robert Watson, previously a Senior Research Associate at Cambridge.

Honours, Awards and Competitions

- Andy Pitts has been made a Fellow of the ACM for his contributions to the theory of programming language semantics.
- Jon Crowcroft elected to the Royal Society.
- Marcelo Fiore, Professor in Mathematical Foundations of Computer Science, was awarded the 10-Year Most Influential PPDP Paper Award for his paper ‘Semantic Analysis of Normalisation by Evaluation for Typed Lambda Calculus’
- Anuj Dawar was elected president of the European Association for Computer Science Logic (EACSL) at the annual meeting of the association. He assumed the role at the beginning of 2013.
- Steven Murdoch was awarded a Royal Society Research Fellowship.
- Timothy Jones was awarded an EPSRC Research Fellowship.
- Manfredas Zabarauskas was selected as one of nine Highly Commended students in the field of Computer Science & Information Technology in the 2012 Undergraduate Awards.
- Ramsey Faragher was winner for his poster “Opportunistic positioning” at the Computer Laboratory 75th Anniversary Poster Competition. Joint runners up were Sergei Skorobogatov and Anastasios Noulas.
- Kiran Rachuri received the Mark Weiser Best Paper Award at the IEEE International Conference on Pervasive Computing and Communications 2013 (PerCom 2013).
- RealVNC, the company founded by Computer Laboratory’s Professor Andy Hopper and Andy Harter, was awarded its third Queen’s Award for Enterprise.
- Malte Schwarzkopf received the Best Student Paper Award at EuroSys 2013.
- Tadas Baltrušaitis, Peter Robinson and Louis-Philippe Morency won the Publication of the Year award at the Cambridge Ring’s annual dinner for their paper on “3D Constrained local model for rigid and non-rigid facial tracking”.

- Jean Bacon, Professor of Distributed Systems, was awarded an Honorary Doctorate of the Open University.
- Marwa Mahmoud won the best paper award at IEEE Face and Gesture Conference in Shanghai for her paper on “Automatic behavior descriptors for psychological disorder analysis”.
- Professor John Daugman was inducted into the US National Inventors Hall of Fame, in Washington events at both the White House and the US Patent Office. He was also one of three finalists for a European Inventor of the Year Award.
- RealVNC, co-founded by Professor Andy Hopper and Dr Andy Harter, won the Royal Academy of Engineering MacRobert Award, the premier award for UK innovation in engineering.
- Jon Crowcroft, Marconi Professor of Communications Systems, was awarded the 2014 IEEE Internet Award.
- Glynn Winskel received the LICS Test of Time Award for his paper ‘Bisimulation from Open Maps’ with Andre Joyal and Mogens Nielsen from 1993.
- Raspberry Pi received an INDEX 2013 Award in the Play and Learning category.
- Dr Ian Wassell and Wei Chen were awarded the 2013 IET Wireless Sensor Systems Premium Award for their paper “Energy-efficient signal acquisition in wireless sensor networks: a compressive sensing framework”.
- Zhen Bai, working with Alan Blackwell and George Coulouris, received an Honourable Mention for her paper "Through the looking glass: pretend play for children with autism." at the International Symposium on Mixed and Augmented Reality in Adelaide.

Activities

In April 2013 the Computer Laboratory celebrated its 75th Anniversary. Professor Sir Tony Hoare got proceedings underway and delivered the annual Wheeler Lecture titled ‘Could Computers Understand Their Own Programs?’ Later in the afternoon, Dr Mike Lynch OBE, delivered the Innovation Lecture. The event concluded with the Innovation Discussion Panel, chaired by Professor Andy Hopper. Attendees were able to quiz panelists Dr Andy Harter (co-founder and CEO RealVNC), Dr Mike Muller (co-founder and CTO ARM), Dr Mike Lynch (co-founder Autonomy Corporation) and Dr Eben Upton (co-founder Raspberry Pi).

The 75th Anniversary event also marked the launch of our publication, Cambridge Computing: The First 75 Years, written by Professor Haroon Ahmed. The book charts the Laboratory’s towering history of innovation and entrepreneurship from the EDSAC computer to Raspberry Pi. Numerous copies have been sold and complementary copies have been distributed to a selection of around 600 schools taken from the University schools database.

The annual dinner of the Cambridge Computer Lab Ring, the Lab’s graduate association, was held in the evening of the 75th Anniversary celebrations. 114 guests filled The Old Hall at Queens’ College to raise a glass to the Computer Laboratory and its next 75 years.

In July, members of staff attended an Away Day at Churchill College to discuss the Computer Laboratory’s operational strategy and tactics for the future.

Dr Robert Harle and Dr Robert Mullins represented the Department at the Oxbridge Conferences.

Dr Robert Harle gave the computer science lecture at the University's Subject Masterclass series.

The Supporters' Club held another successful recruitment fair and offered a range of technical lectures and workshops for students. Club members also submitted proposals for the Part IB design projects and acted as clients.

Research

The Computer Laboratory's research programme continues to produce world-leading work and research continues to be the heart of the Laboratory's business.

Over the last year our sources of research funding have remained fairly consistent. The majority of our funding still comes from UK Research Councils, however, this year we have seen another increase in EU and overseas funding. This has taken our actual research income from £4.8M in 2011-12 to £6.3M in 2012-13. The diversification of our funding sources is an encouraging trend and one we would like to see continue.

Amongst the Computer Laboratory's portfolio of active research grants, we have a broad spectrum of topics. Highlights from the last year include:

- Ted Briscoe, together with a team of principal investigators from the Departments of Engineering and Theoretical and Applied Linguistics, were awarded funding to create a new institute to undertake research on Automated Language Teaching and Assessment (ALTA). The institute is administered by the Computer Laboratory and its remit is to conduct research in computer systems and platforms, corpus linguistics, computational linguistics, speech processing and machine learning. Currently over the three Departments there are 4 postdocs and 4 PhDs working on it and they are about to advertise a further 8 positions.
- The University has been recognized as an "Academic Centre of Excellence in Cyber-Security Research" by the UK Government, coordinated by Dr Frank Stajano. This status was awarded in particular in recognition of security research at the Computer Laboratory. The first PhD studentship under this programme was awarded to Dr Markus Kuhn.
- Peter Sewell is Principal Investigator for the award of the REMS (Rigorous Engineering for Mainstream Systems) programme grant. REMS brings together a team of leading theory and systems researchers (including Mike Gordon, Andrew Pitts, Philippa Gardner, and Ian Stark on the theory side and Jon Crowcroft, Simon Moore, Robert Watson, and Anil Madhavapeddy on the systems side), with key industrial partners (including ARM and IBM), to establish a new synthesis. They aim to establish engineering mathematics for the construction of more robust and secure computer systems: mathematically rigorous models, verification techniques, and engineering tools applied to the construction of full-scale mainstream computer systems, including key infrastructure in widespread use today (multiprocessors, programming languages, and operating systems).
- Robert Mullins starts a new European Research Council (ERC) funded project on power efficient many-core machines and continues his work with the RaspberryPi foundation.
- Simon Moore continues to collaborate with the Security and Systems groups on two DARPA funded projects developing more secure systems from a new processor (CHERI) through language, compilation and operating systems to deliver more robust applications.
- Sam Aaron (funded by donations from the Broadcom Foundation and Raspberry Pi Foundation) has developed the "Sonic Pi" system and associated teaching materials

based around music and programming. He has successfully applied many of these ideas in schools which has attracted enthusiastic media coverage, as well as an Arts Council grant (with Alan Blackwell) to extend creative opportunities for young Raspberry Pi users.

Sam has also played to audiences around the world with his "live coding" band Meta-eX. Gigs have included nightclubs and other venues in London, Kiev, Antwerp, Berlin, Tampere, Prague, Zurich and Vilnius. Sam is the core developer of Overtone, the software that powers Meta-eX, which provides a strong technical foundation for exploring new research questions in programming language liveness and interactivity.

Research Evaluation Framework (REF)

The Laboratory has just completed its REF2014 submission, which allows us to compare our position against that of six years ago, when we wrote our RAE2008 submission.

The Computer Laboratory has expanded in size since the RAE2008 submission was written, with five academic appointments having been made. Four of those were new lectureships. The fifth was to fill the vacancy left by Fraser's resignation to work full-time on the Laboratory spin-out, Xensource. Since 2008, the number of contract researchers has increased by 86% (from 36 to 67). Three research groups (Graphics & Interaction, Computer Architecture, and Digital Technology) have moved into the top floor of the William Gates Building, which was previously occupied by commercial lettings. The Laboratory now occupies almost the entire building.

Over the REF period, one strategic aim was to recruit staff to five new academic posts. The environment of austerity made this challenging. However, the University supported the Laboratory's case that it should expand when others were being asked to contract. The Laboratory was thus able to create four new posts in the period. This expansion is largely due to the considerable income that the Laboratory brings to the University through its research. The Laboratory has more than doubled its annual research income over these six years (£6.3M in 2012-13 cf. £2.8M in 2006-07), hence the concurrent expansion of its post-doctoral work force by 86%. This is an excellent outcome under a regime of financial austerity.

Teaching

The MPhil in Advanced Computer Science (ACS) continues to flourish and the undergraduate fourth year (Part III) has seen a slight increase in numbers.

Part IA is now being delivered in a revised form in the current academic year. Serious thought is being given to a further revision or part IA where a total of three Computer Science papers are offered, meaning that first year students can spend 75% of their time reading Computer Science or Computer Science and Cyberphysical Systems

Prolog has been an on-line "interactive video" lecture course since 2012-13. There are no formal practical classes with assessed work, however the course lecturers work interactively with the students on the material in the Intel Lab at the scheduled lecture time. There are no demonstrators as this is a substitute for the in-person lecture. After the end of the course, students are required to do a piece of independent practical work in either Prolog or C/C++. We are exploring a greater shift in this direction for several further Part IB courses. A review

of part IB is currently underway, lead by Ian Leslie and it is expected that Part IB will be offered in a revised form next year.

Building and Facilities

The increase in staff has necessitated us to think carefully about making the best use of space in the building and we will continue to investigate ways of creating space for further expansion. Further ways of savings energy are still being explored, keeping a balanced view of running a building that works well for users as well as being efficient the whole year round.

Visitors

We have been pleased to host many academic visitors including the following:

- Professor Haroon Ahmed, Emeritus Professor of Microelectronics, Cavendish Laboratory
- Professor Warren Hunt, University of Texas at Austin, USA
- Dr Matt Kaufmann from the University of Texas at Austin
- Professor Peter G Neumann, SRI International, USA
- Dr Anna Slobodova, Centaur Technology, USA
- Steven Tanimoto, University of Washington
- Visiting industrial fellows Peter G Neumann (SRI), Hassen Saidi (SRI), Brooks Davis (SRI), and Ben Laurie (Google) continued their collaboration with the DARPA- and Google-sponsored CTSRD and SOAAP projects