The Ring

The journal of the Cambridge Computer Lab Ring

Issue XXIII — January 2010 — £20

www.camring.ucam.org

Ring news

Letter from the Editor

With the UK stuck in its worst slump since World War II and graduate unemployment at its highest for more than a decade, one could be forgiven for thinking that interest in the Computer Laboratory's recruitment fair might be limited. In fact, it was a sell-out. 48 Supporters' Club members attended with Hall of Famers Real VNC, Zeus and nCipher (among others) rubbing shoulders with Google, Disney and Deutsche Bank in their search for the next crop of talented Computer Lab graduates.

So it is concerning that, despite strong demand for highly educated computer scientists — and the fact that children between 10 and 16 seem to spend all their time with mobile phones taped to their ears, tapping keyboards and playing computer games — applications to Cambridge fell by 46% between 2000 and2008. This trend is not unique to Cambridge, and the question of how to enthuse school children is exercising universities throughout the UK, Western Europe and the US. In common with the decline in university applications, Computing A Level saw a drop of more than 20% in 2009.

So, what should be done? This edition of *The Ring* offers insight and perspectives from a number of Ring members in academia: Professor Richard Millar, Dean of the Faculty of Computing and Engineering at the University of Ulster; Annette Haworth, sometime Pro Vice Chancellor and Director of Information Services at Reading University; and Pablo Arrighi, Lecturer at the University of Grenoble. Ian Benson (K PhD92), Visiting Professor in Maths at Kingston University and Visiting Scholar at Stanford University, argues that changes need to be made to education for much younger children, and that a radical change in the approach to maths teaching at primary school is needed.

One current final year student also offers his opinion — though he wishes to remain anonymous!

As Annette Haworth writes on page 10, the Lab has "sixty years' worth of alumni… [we should] ask them why they chose computer science". So, please do get in touch and let us know.

On the networking front, the regular calendar of events continues: the London Ringlet bars, roundtable discussion events in both Cambridge and London and **the annual dinner**. This year's dinner — which also sees the announcement of the Hall of Fame winners — will take place at Queens' College on Wednesday March 17th 2010. Master of Ceremonies is Professor Andy Hopper and we are delighted to welcome Dr Andrew Herbert, Managing Director of Microsoft Research Cambridge, as guest speaker. The dinner is always a sell-out, so please book early to avoid disappointment. A booking form is enclosed.

The Ring Council has already called for nominations for the 2010 **Hall of Fame Awards** so, if you haven't yet submitted a nomination, please do so before the January 31st 2010 closing date. Details of the various categories, and a nomination form, can be found on the Ring's Web site.

The number of companies founded by Lab graduates has now grown to 175. The latest addition is GradFutures, founded by Toby Austin (JE BA05), and is profiled in this edition. Many of the Hall of Fame have been surveyed by Auriel Folkes for her article on the Finance Function (page 13). Auriel provides an interesting and helpful insight into the way CEOs view the role of the Finance Director.

Events calendar

2010

March

Wednesday 17th, 19:00

Ring annual dinner

Guest speaker: Dr Andrew Herbert, Managing Director of Microsoft Research Cambridge
Queens' College, Cambridge
Reception 19:00; dinner 19:30
Admission by ticket only

Visit the Ring Web site at www.camring.ucam.org for the latest news about Ring events.

Who's who

Mark Ashdown (CHU BA99 PhD04) is now working as a technical consultant at Thales. In September he completed a three-year project on asymmetric remote collaboration for distributed teams, funded by a European Union Marie Curie fellowship. Mark spent the final year of the project at Thales.

Louise Auger (CAI BA98), a staff engineer at Qualcomm, has started a psychology degree with the Open University.

Jonathan Ayres (R MA92) has left Cazenove Capital Management where he was Head of Finance. He is now at Ecofin, an independent investment management firm which specialises in the global utility, infrastructure, alternative energy and environmental sectors, where he is Chief Financial Officer.

Nick Brasier (CHR BA85) is Director of Product Management at Avaya, a business telecommunications equipment supplier. Nick has represented Great Britain at target rifle shooting, winning the World Championship in Ottawa in 2007.

Richard Brooksby (CL BA91) is a director at Ravenbrook, a software engineering consultancy.

Following their success with Camrivox, **Jonathan Custance** (JN MA95) and **James Green** (F MA96) have recently founded Green Custard. Green Custard has already been selected as runner-up in the App Star Awards, for "Extreme Sheepdog Trials", a game which tests your ability to control a sheepdog using whistling, gestures or buttons through a series of levels from "simple to fiendish".

Paul Dyson (CHU BA83) is head of development at Tucasi.

Nicholas Fox (PEM BA93) works for Ipulse as a patent attorney specialising in computer-related inventions. Ipulse is a firm of patent and trade mark attorneys assisting companies to develop their intellectual property.

Matthew Grounds (EM BA00) is a programmer at LucasArts in San Francisco. LucasArts, part of the Lucasfilm group of companies, is a computer games developer and publisher.

Bhaskar Harita (W PhD91) is working in Bangalore as an independent consultant. He was previously a senior product director at Motorola.

Caroline Gasperin (CH PhD09) is doing post-doctoral research at the Universidade de São Paulo, Brazil.

James Harvey (CAI BA98) is Principal Architect at Thales. James is also chairman of Cambridge Chorale, category finalists in the BBC Choir of the Year 2008 competition.

Andrew Jefferson (G MSc09) is doing a PhD at Imperial College, London.

Martin Kleppmann (CC BA96) is selling his start-up, Ept, to Red Gate Software, itself founded by Ring members Neil Davidson (T BA93) and Simon Galbraith (M PhD97). Martin will continue to work on Go Test It (Ept's flagship product). Ept, based at Red Gate's offices in Cambridge, is one of the companies participating in its Springboard programme. Springboard gives entrepreneurs a chance to turn their ideas into software businesses. Martin has also received invaluable advice and support from his mentor and investor, Ring Council member Peter Cowley (F MA77).

Since **Aaron Lee** (TH PhD96) left Google a year ago he has started RedBeacon, a Web site that aims to match consumers with small business providers such as plumbers,

The Ring, Issue XXIII, January 2010, price £20/€30/US$40

Web: www.camring.ucam.org

E-mail: jan.samols@cl.cam.ac.uk

Tel: +44 1223 763585

Post: William Gates Building, Cambridge CB3 0FD

Published three times a year. Copy deadline for the May 2010 issue is March 25th 2010.

The Ring is the journal of the Computer Lab Ring, which is the graduate association of the University of Cambridge Computer Laboratory.

lawyers or landscape gardeners. RedBeacon has won the 2009 TechCrunch50 Best-in-Show Award.

Ben Medlock (F MPhil03) has started TouchType. The company is developing next-generation text prediction engines, focused primarily on the mobile device/portable computing market, but also on enhancing text entry efficiency for assistive technology. TouchType has won three Technology Strategy Board grant competitions over the past year, and recently a UKTI-funded place at the Mobile World Congress in Barcelona in February 2010. Ben is currently talking to a number of leading mobile manufacturers and hopes to secure a significant contract soon.

Ian Mercer (JE A86) is working on his latest venture SignSwift. The company makes digital signage easy for small businesses. In 1988, Ian (with Lab graduate Mark Atherton) founded NextBase, which launched AutoRoute, the first consumer route planning and mapping software for PCs. In 1994, NextBase was sold to Microsoft, and the technology is now found in Microsoft Expedia Street and Trips, Microsoft MapPoint, Bing Maps, Encarta World Atlas, and Virtual Earth. In addition Ian holds The Guinness World Record for the 'Fastest Music Video Production from Film to Broadcast'!

Steve Montgomery (CHU BA86 PhD90) left Ricardo at the end of 2009. He is focusing his efforts on chairing the Motor Industry Software Reliability Association's (MISRA) Working Group on the C programming language. MISRA provides assistance to the automotive industry in the application and creation within vehicle systems of safe and reliable software. It has developed guidelines for the use of the C language in critical systems. Steve will also be acting as MISRA's liaison to the ISO Working Group 14, which is working on the next version of the C language standard.

Chris Sutton (CAI BA05) is an R&D engineer at Intrasonics.

Ben Tregenna (T BA98) runs Rekenys, a software consulting company.

Jonathan White (PEM BA81) is head of research at Haemonetics in Massachusetts. Haemonetics create and manufacture software and medical devices for the integration of the management of blood and blood products. Jonathan is a Fellow of the Royal College of Surgeons.

Jane Williams (NH BA87) is an analyst at IMI.

Hall of Fame news

blinkx

blinkx, the largest and most advanced video search engine, partnered with the WWF to bring live footage from the Copenhagen Climate Summit.

Camrivox

Camrivox has been sold to Papillon Technology. Camrivox products continue to be developed and marketed by Papillon but sold under the Camrivox brand.

Jagex

Jagex Games Studio, The UK's largest independent games developer and publisher, has been awarded 22nd place on The Sunday Times Microsoft Tech Track 100 report.

Tideway

Tideway has been acquired by BMC Software.

Ubisense

Ubisense, the world leader in Precise Real –Time Location Systems, has won the 2009 Deloitte Technology Fast 500 EMEA Semiconductor, Component and Electronics Sector Award.

Letter from Whitehall

Labour's Schools Bill abolishes the keystone national numeracy and literacy strategies. It gives computer technology a core place in the primary curriculum alongside English, maths and personal skills. **Ian Benson** asks whether this will this mean even more teaching time spent chasing viruses, or a renewal of the pure mathematicians' drive for elementary school conceptual maths?

It is five years since Sociality, a Hall of Fame software company, was approached by Charles Clarke (K 1969), Secretary of State for Education, and asked for help to get better value from the Government's investment in information and communication technology (ICT) in schools. Sociality was approached on the strength of goodwill generated by our work since 1999 on design, analysis and implementation of open systems for co-production of public services.

Our advice to the Secretary of State was threefold:

- The Government could not expect the return on investment that the universities deliver in ICT if local authorities continued with the practice of locking down computers so that they are not programmable by teachers or pupils.
- If the conceptually impoverished unfolding of arithmetic concepts mandated by national strategy were to be left unchanged, software would reduce teachers and children to machine minders.
- If he really wanted to use technology productively then he would need to precipitate a conversation among teachers, parents and pupils about the content of primary education — starting with mathematics.

Our suggested next steps ("Phase 1 terms of reference") were accepted by the DfES Innovation Unit, and we began work in the academic year 2004–5 with a cluster of schools in North West Leicestershire. This had been the site of a failed attempt at maths reform in the 1960s. Our proposal was to re-evaluate that attempt and determine how conceptual mathematics and open ICT might enhance the effectiveness of the rejected curriculum of two leading educators, Georges Cuisenaire and Dr Caleb Gattegno.

Gattegno had been the prime mover of a Commission of distinguished pure mathematicians who he assembled after WWII to meet the needs of the post-war elementary and secondary modern schools. He brought together: Evert Beth, the inventor of the semantic tableau used in formal reasoning; Jean Dieudonné, prominent in the Nicolas Bourbaki group that reformed university mathematics after WWI; and Gustave Choquet, whose work on capacities and integral representations found many applications in analysis and probability. Choquet's "What is Modern Mathematics" became their manifesto for a forceful challenge to the dominant ideology of the eugenicists who had shaped the architecture of the Butler Act.

The historic development of culture, if it has something to bring to our understanding of the present moment, can be entirely foreign to what a mind stimulated in a new way can or could do, unforeseen in the former experience of the group.

These architects, notably the alleged statistical fraudster Sir Cyril Burt, and his collaborator Jean Piaget, argued from a preconceived idea that there are defined stages in the evolution of thought. In Burt's case not only the stages, but also the ultimate level of cognitive capability, were genetic. Gattegno's Commission believed that this was completely erroneous as a vision of what intellectual activity is, in an individual suitably stimulated by his environment. Gattegno wrote that "the historic development of culture, if it has something to bring to our understanding of the present moment, can be entirely foreign to what a mind stimulated in a new way can or could do, unforeseen in the former experience of the group. Too rigid a determinism, coupled with a slightly sentimental historicism, risk making us ignore whole continents potentially present in the mental universe."

Gattegno developed just such an open approach in a series of seven textbooks for children. He used colour-coded rods to help pupils of primary age to learn the four basic operations with algebra before arithmetic. A roll-out to hundreds of Canadian schools showed that it took pupils half the time to master what was expected of them in their six years of primary mathematics. The approach was rapidly

taken up in Scotland and England, only to falter in Leicestershire after a three-way, ill-prepared and small trial. By the mid-sixties a small cabal of educational psychologists, wedded to Piaget, had succeeded in winning back control of "maths education", aided by Piaget/Burt's dogma of statistical assessment which they entrenched as national standards in the US and UK.

In the Cuisenaire-Gattegno approach children learn to speak and write mathematics as a language, and to recognise mathematical activity as the unfolding of concepts that they approach from four distinct perspectives: Actions (using sets of fingers and coloured rods), Behaviour (using imagery generated by these actions), Speaking (using language to describe the images) and Writing (using symbols and notation). By teaching all four operations and fractions together from Year 1, Gattegno's curriculum anticipated object-oriented techniques that minimise complexity and logical dependence in systems.

Norman Jones, head teacher at the Phase 1 alpha site, said:

> "The study involved 73 Year 1 children in four schools. 47 children followed the National Numeracy Framework (NNF); 26 (the 'Nygaard cohort') augmented NNF with Cuisenaire-Gattegno materials. The 26 children were the younger and least able third of the group. We looked to achieve the 15% 'step change' demanded in the 2006 KS2 targets. We found that after one term these children had advanced by one or two quartiles compared to their peers. This gives us hope that the step change can be achieved."

Encouraged by this trial the DTI commissioned Sociality as project managers for a second phase of work which we called the Tizard project. We were asked to create software tools, algebraFirst™, to scale up our proof of concept. We extended Gattegno's approach to analyse the conceptual unfolding of the National Numeracy Strategy/Framework (NNF). We were able to demonstrate and plug systemic gaps in the NNF with algebraFirst™ material. The result was a successful proof of concept and a step change in the understanding of teachers and children.

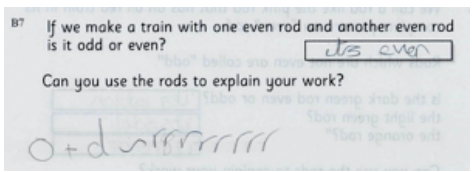
Bricks World™ teaches children to think like mathematicians. Teachers record and encapsulate learning episodes that consist of children's actions, behaviours, spoken and written work. Children learn to recognise that they are working at the same time at four different levels. These are: the activity of putting coloured bricks end to end to form a "train"; the recognition that there are many ways to choose a pair of colours to combine; the simultaneous perception of the train and its component bricks; and the awareness that the written sum is both inherent in the train and distinct from it.

By combining coloured rods with guided free play and written exercises we are able to use ICT to prototype tools for the professional development of adults who work in the classroom: teachers, assistants and parents. We built an open source Web portal, Guildhall™, which is now subsumed into Apple's OS X Server wiki service. The wiki functions as an information system and repository for pupils' work, within a security envelope that gives the individual ownership and control over its publication.

In 2005, in an informal review of Sociality's work, Dick Tizard, outreach pioneer and sometime Senior Tutor of Churchill College, challenged us to recruit 30 primary schools in all. We are now well on the way to that goal, aided by a worldwide network of developers and teachers who have contacted us since Tizard was given its permanent West Coast home at Stanford University Computer Science Department (http://tizard.stanford.edu).

Tizard's programme is now entering its final year. We have tracked and supported over 250 pupils in ten English schools. Our alpha schools have proven and tested over 200 hours of professional development materials that range from Reception to Year 6.

This final year of the project we are piloting a text book with teachers and parents that uses conceptual mathematics to explain how pupils develop their mathematical awareness in Gattegno's approach. Together with schools in France, US and UK we are using his text books to help teachers learn conceptual mathematics.



The illustration shows how one Year 3 girl, aged 8, was able to use equivalence to explain her reasoning in answer to a question about the parity of the sum of two even parities.

With five years of data and experience under its belt, Sociality is well placed to take advantage of the freedoms that schools will gain under the Improving Schools and Safeguarding Children Act to buy support for school clusters and curriculum reform.

Sociality software and services will be ready to meet that challenge and roll back the virus of "counting first".

Ian Benson graduated with a PhD from King's College in 1992.

Find out more about Sociality at www.sociality.com

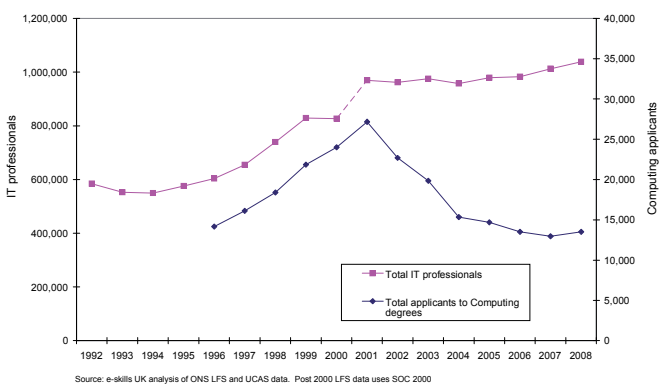
Opinion

Mind the gap — the supply and demand for Computer Science graduates, by **Professor Richard J. Millar**.

If you go back ten years, the demand for courses in computer science was huge. The word "computer" only had to appear in the title of a course and its success was guaranteed. Then came the "dot-com bust" in the year 2000 and the accompanying publicity of many big names losing large amounts of money — and a steady decline in applications for courses in computer science ever since. At its peak in 2004 (remembering that those graduating in 2004 commenced their studies in 2000 or 2001) there were just over 20,000 graduates from full-time courses in computer science from UK universities. In 2008, which is the latest data available from the Higher Education Statistics Agency, this total has fallen to just under 15,000 graduates — a drop of over 25% in just four years! When these figures are interpreted in the context of the growth in participation in higher education over the same period, the decline is even more dramatic: computer science graduates comprising 7.76% of the total graduate numbers in 2004 and only 5.02% in 2008 — a difference of over 35%.

The Sector Skills Council for Business and Information Technology, e-Skills UK, has demonstrated the emerging gap in the supply and demand for computer science graduates in the UK in the following graph.

IT professionals in the workplace/UK applicants to Computing discipline degrees 1992–2008



Source: e-skills UK analysis of ONS LFS and UCAS data. Post 2000 LFS data uses SOC 2000

An interesting observation from this graph is that the number of IT professionals in the UK did not fall significantly around the time of the dot-com bust. Indeed, the general trend has been one of growth ever since, but with an ever–widening gap between the supply and demand sides. What is immediately apparent is that the graduating numbers are not going to get better any time soon — notice that 60% fall in applications (in a year of recession, I would not read anything into the slight upturn in the last year!).

Possible root causes

The general pubic has a poor understanding of careers in IT. As an industry, we have to stop talking about jobs in IT and start presenting the *profession* of IT. We are competing with well-established professions such as medicine, law and accountancy (and people *think* they understand these professions — probably because they have some contact with them). But we need to understand the uphill struggle that is ahead of us in this endeavour. The public perception of the IT industry is poor: it is associated with an isolated existence, sitting in a cubicle in front of a screen all day (the "call centre" image); associated with pornography, hacking and viruses (parents are being told to protect their children from the Internet and to protect their PCs from those who are phishing for their bank details or who want to wipe their data). The underlying message here is that this industry is unethical. If that were not enough, the media portray anyone who wants to work in the IT profession as an anorak, a geek or a nerd. Invariably we are social misfits who wear thick glasses and who are wedded to our machines. Finally, in terms of perceptions, the job losses of the turn of the century are still remembered and parents are concerned that there is no future in this industry —after all, isn't it all being outsourced to India and China?

The subject of "ICT" in schools does us a great disservice. Its uptake has comparable to that of modern languages such as French, but it was never designed for those wishing to specialise in computing: for those, there is the subject of "computing". Many schools across the UK offer

ICT — with its emphasis on word processing, using spreadsheets and simple databases — and not computing. This has two effects: it brings students into computer science with an incorrect understanding of the subject and they rapidly become dropout statistics once faced with discrete mathematics, programming and referential calculus; and it dissuades the brightest students from studying computer science at university since they see no challenge in it.

A specific instance of all of this is the lack of understanding of the IT industry by careers teachers. Given the skills shortages in the industry, careers teachers are rarely from an IT or science background. More typically they have taken on these roles due to a decline in demand for their 'core' subjects such as classics or modern languages. They observe pupils excelling in ICT and encourage them to consider computer science — with the aforementioned consequences.

Finally, applicants to courses in computer science are largely (though not exclusively) drawn from those who have studied science, technology, engineering and mathematics (STEM) subjects in school, because of the analytical skills they have developed. The emerging picture is one of a dramatic shift in interest away from the physical sciences towards the biological sciences. Just as applications to computer science have fallen sharply over the last ten years, those to subjects allied to medicine (nursing, physiotherapy, speech and language therapy, pharmacy, etc.) have more than doubled in the same period. The UK is now in a situation of over-supply in many of these disciplines and yet the applications continue unabated. There has been a significant increase in numbers studying mathematics at A level but this is often to secure a place in medicine or in subjects allied to it.

Addressing the challenge

So how do we encourage more young people to consider studying computer science at university? We have to address the root causes outlined above. In developing the public understanding of the IT Profession we must deal with the "image problem". Good literature is part of this solution, but perhaps more importantly we need to get the industry engaged with our schools. This engagement needs to take several forms: assisting schools with project work on IT themes; participation in IT-themed competitions where schools have the opportunity to work on real-world problems; identifying young ambassadors for the industry who can speak to school pupils about their own experiences and career development; contributing to awareness-raising campaigns through media such as Web sites and Twitter; and providing opportunities for field trips to the IT Industry's customers — because it is the applications of the IT that will excite and spark interest. Yes, some of this is already happening, but much more could be done: we need meaningful partnerships between schools and the IT industry, not "one-off" visits.

We need to demonstrate that working in the IT Profession usually involves team working, that it has opportunities for travel, that most companies have a thriving social calendar of events and that it is a relatively secure, well-paid career. We need to show the transferable skills that are developed in the study of computer science — skills such as problem solving and project management — that have applicability to many disciplines.

Universities have their part to play in this recovery. We need to provide exciting and relevant courses that capture the imaginations of young people who are using the technology on a daily basis and yet never stop to wonder how it all works. We need to link into the themes that motivate "Generation Y" such as sustainability and addressing inequality in the world (and we know that IT has much to offer here). With the interest in subjects allied to medicine, maybe specialisms such as health informatics need to become more prevalent.

The UK is facing a crisis in the lack of graduates in computer science. If Government is serious about the part that the IT industry has to play in the future prosperity of the UK then it is time to consider waiving university fees for courses in computer science.

In summary, the UK is facing a crisis in this lack of graduates in computer science that is not only going to stifle growth in the IT industry but also leave it seriously exposed in terms of replacing staff who leave it through retirement or a move elsewhere. There is an urgent need to change the perception of the industry and to improve careers guidance — and role models are key to this. In effect, we need to sell the lifestyle. If Government is serious about the part that the IT industry has to play in the future prosperity of the UK then perhaps it is time to consider waiving university fees or funding some bursaries for courses in computer science (as is the case with some other subjects).

Ten years ago we had it easy when students were falling over themselves to get into courses in computer science. When the recovery comes, we must not again take it all for granted.

Professor Richard J. Millar graduated from Pembroke in 1986. He is currently Dean, Faculty of Computing and Engineering at the University of Ulster.

Opinion

The decline in the study of science and technology is particular neither to the UK nor the US. France faces a similar problem. **Pablo Arrighi** is currently a lecturer at the University of Grenoble. He argues that science needs to learn the art of seduction.

The decline in the study of science and technology is as acute in France as it is in the UK. However, I have to admit that the French solution is neither smart nor original. Put simply, we just seek to attract more foreign students.

This is by no means a solution to the problem; it is a displacement of the problem.

I would rather we faced the problem head on and sought to find an answer to the question "how can we make science sexier?"

Like many young people, my younger sister turned her back on a bright career in mathematics, drawn instead by the prospect of a more "fun" career in films. The attraction of such "soft" subjects is understandable. Indeed exciting, "cool" sci-fi movies inspired many of us to go into the sciences, so we must learn from the soft subjects and use some of their powers of attraction to our own advantage.

> *We must learn from the "soft" subjects and use some of their powers of attraction to our own advantage.*

This reminds me of a trip I made to attend a CMI (Cambridge/MIT Institute) workshop at MIT when I was a PhD student in the Computer Lab. At some point I got bored and decided to see what was happening on campus. I found myself in the student union where students were participating in a number of workshops. One involved a huge dinner table supporting a regiment of cutlery. The participants were taught which knife to use with what, thus avoiding the "Pretty Woman" syndrome. The second workshop was designed to teach you to speak frankly to your colleagues, helping you perhaps to tell them something they may not want to hear — like people shouldn't blow their noses in their napkins. The third workshop was on the art of seduction. And yes, I attended this one!

We were put in pairs (one woman, one man) and asked to play out a seduction scene, but with the traditional roles reversed. By the end of the evening, I like to think I completed the workshop with flying colours!

So what is the point of this story? Admittedly, even if we forced all awkward scientists to attend workshops on seduction, they wouldn't turn into suave, confident, arty types. Likewise, making your average cinema-goers sit through exciting sci-fi movies doesn't make them into the scientists of the future. While we shouldn't feel we need to apologise for that — after all, it is scientists who lead the way and make things work — the trick, as the workshops demonstrated, is to get the message across in an attractive, friendly and enticing way.

Recently I went to a hypercomputation workshop, because some people think that we can solve the Halting Problem by throwing computers into a black hole. We were shown a cool movie which simulated the optical effects one would get when entering the horizon of a black hole. That night I went back to my hotel, and ended up chatting to a lady. She politely asked me what the workshop was all about. I looked her in the eyes — which I must admit were pretty and dark — and told her that I knew that she was in front of me because light rays go in a straight line. However, the workshop explained that if we were to fall into the horizon of a black hole, the gravity would be so strong that it was possible that she would not appear in front of me, but rather high above me because light would bend. At that she smiled, her eyes shining brightly.

So, we must not be afraid to borrow from the soft subjects. Harnessing their power to seduce will help us to show that we scientists are pushing the boundaries of what's possible.

Pablo Arrighi graduated with a PhD from Emmanuel College in 2003.

Opinion

Giving young people experience of computer science may be key to getting more to choose the subject, says **Annette Haworth**.

"How do we encourage more young people to read computer science?" seemed a simple enough question when Jan asked it. But it raises underlying questions: "what do we mean by …?" and "does society want more?", which in a longer article would need deeper exploration while attempting to answer the question as set. In brief, an ACM review reports a 50% drop in candidates over this decade. This feels counterintuitive against a backdrop of massively increased public use of computer-based systems. So what's happening?

Computer science as understood at Cambridge embodies some persisting principles overlaid by relatively (compared to more classical studies) fast-changing subject areas. The ACM, for example, recently halved its syllabus revision period from ten to around five years. It is a challenge for school teachers to keep abreast and hence explain accurately what computer science at university might mean. Compared to even just a decade ago, there is a proliferation of terms such as "IT" and "systems engineering". One teacher says she explains that "ICT is using the box, computing is what goes on inside the box" which she feels "is as accurate as most glib answers but tends to allow [pupils] to sort out which direction they want to go in".

As well as cutting through this subject proliferation, candidates for "real" computer science must have top-level mathematical skills and yet somehow not want to read pure mathematics. Those with high mathematical ability, into abstraction and structure, need to be galvanised by the additional excitement of making things work.

Comparing my own experience of forty years ago with that of a current schoolgirl whose report I have just seen, our motivation for studying computer science is surprisingly similar. We had practical experience. Mine came from working at ICI in my gap year, fascinated by programming in Autocode, and hers came from attending the Headstart scheme at a university this summer.

And finally, how one final-year student sees the situation

I think that the key problem is that there is no computer science education at school (that I know of), so it is only an obvious choice for people already interested in the subject.

It seems strange to me that a subject so universal in the modern world is taught so little. I always find it particularly hard to explain what it is when people ask. To someone with no prior knowledge in the subject, I find the most effective answer is that a large amount of it is about problem solving, and analysing how well different solutions solve a problem. This clearly only covers certain areas of the subject (eg, algorithms, complexity, computation theory) and not things such as computer architecture, but gives a fairly good idea.

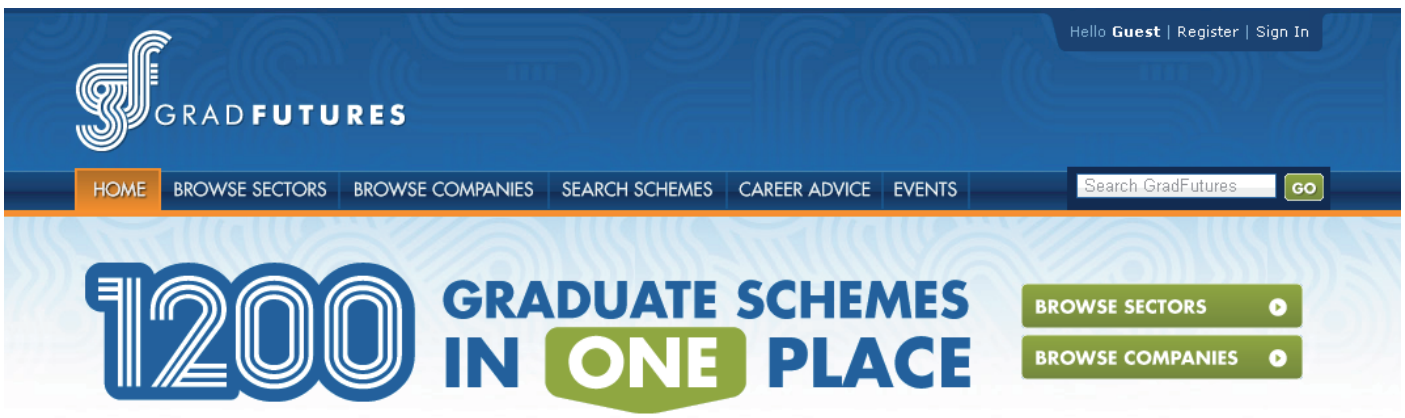
I think the best way to show people what the subject is, might be to have a set of example questions, with model answers, that are carefully chosen to require little to no prerequisite knowledge but which capture the nature of the problems that computer science tries to solve.

I do realise that a sample of two will not persuade all you numerate readers that I have a valid conclusion. But it is at least one that the Lab can test. Sixty years' worth of alumni makes a pretty good sample set — ask them why they chose computer science. If "experience" comes out with any significance, organise more of it — gap year internships, summer schools, e-groups — anything to introduce young people of mathematical bent to the excitement that is computer science.

Annette Haworth graduated with the Diploma from Clare Hall in 1969. She was sometime Pro-Vice-Chancellor and Director of Information Services at Reading University and director/trustee of various education-related organisations, including a school.

GradFutures

Toby Austin hopes his new company, GradFutures, will become the leading graduate recruitment site in the UK.



TR: Can you tell me about GradFutures?

TA: GradFutures is, quite simply, a graduate recruitment Web site. We help students and recent graduates find their ideal jobs, and recruiters find great candidates for their vacancies.

Back in 2007 I co-founded GradFutures with two other Cambridge alumni with whom I had been working for two years in my previous job. We launched the Web site in September 2008 and spent some time figuring out how to reach students effectively. Since then, we've raised a second round of funding and started to get some real traction with both students and recruiters.

TR: Did you start GradFutures in response to your experience of careers advice when you were a student? Were there aspects that you thought could be improved?

TA: GradFutures wasn't a direct response to my experience of careers advice at university. It was more a reaction to the plethora of poorly designed and structured graduate job Web sites that I had to wade through when looking for a vacancy. Job-hunting is a difficult process at the best of times, and poor quality Web sites designed principally to collect e-mail addresses and CVs really got in the way.

Having said that, there are certainly things that careers services could do to improve accessibility. One of the most common complaints is over the formality of these services. Students are now used to the instant access nature of the Internet, yet many careers services still require you to make formal appointments with advisers and to complete forms. This approach may have worked for them in the past, but engaging students today requires a more informal approach.

TR: Has the recession had any impact on how you have approached your start-up? Have you changed your original plan in response to it?

TA: Yes, although not as much as the headlines surrounding graduate recruitment may suggest. It's certainly been harder for us to engage the larger recruiters — they're inundated with applicants as it is, so spending time with us finding out how we can improve their intake, even in these times, is not high on their lists.

Instead, we've been concentrating our efforts more on the second tier and small/medium enterprise (SME) recruiters, and, in the process, developed some offerings that work really well in the market. We're hoping that we've timed it nicely for the up-turn!

TR:What is your business model?

TA: The Web site is completely free to users. In fact, we're just about to remove the remaining advertising from the site, to improve the user experience further.

All our revenues are, therefore, from recruiters; but we don't charge "advertising" fees like traditional graduate recruitment Web sites. Instead, we've adopted a "pay for success" model, which comes in two flavours — cost-per-lead and cost-per-application. Both variants are designed to align our incentives with those of the recruiter.

The cost-per-lead option is a pretty standard cost per click (CPC) model: we charge recruiters when a user clicks on the "Apply Now" button. It's a simple mechanism but very attractive to recruiters who are used to being charged up-front fees and seeing no return on their investments.

The cost-per-application option is something we've just started offering to smaller recruiters who don't have their own in-house application handling system. We host a simple application form on behalf of the recruiter and give them access to the applications via an easy-to-use on-line system. We charge on the basis of the number of applications received. So far, this has proved incredibly popular!

TR:What sets your offering apart from your competitors?

TA: For recruiters, it's a combination of our pricing model and our level of service. For example, we work with recruiters to ensure their jobs are described in a way that will be both understandable and appealing to potential recruits, and that we're targeting the right candidates. This is in our interest too, of course!

For students, it starts with the look and feel of our site, which is cleaner and better structured than our competitors (in fact, we're about to refresh our design to improve this even more). But we try to go beyond just jobs by offering practical tips and encouragement through our blog, newsletter and career advice. Throughout the downturn our competitors' sites have often been full of regurgitated headlines about the lack of graduate jobs — often right next to an advertisement for a graduate job! We feel it's important to cut through all this, show the real story behind the headlines and help our users remain positive.

TR:What has been the biggest surprise? Have you made any assumptions that have caused you grief?

TA: I'm pleased to say we haven't had too many surprises as yet! The biggest one so far has been the success of the pay-per-application option with SMEs — they really leapt at the opportunity to be listed alongside the "big guys" in a risk–free way.

As for assumptions, I think we fell a little into the "over specification" trap when we first built the Web site — there are a few things we built based on what we would find useful rather than what our users really wanted. We've learnt from that experience and now conduct much more research before specifying.

TR: Did you receive any outside help or mentoring and, if so, how did it help you?

TA: Nothing formal, although now we've hired experienced permanent staff I find I learn quite a lot informally from them.

TR:What are your goals for GradFutures?

TA: In the short term, it's taking us to break-even. Hopefully, that's not far off! In the longer term, our ambition is for GradFutures to become the leading graduate recruitment site in the UK.

To find out more go to: www.gradfutures.com

The finance function

Auriel Folkes asks CEOs of companies founded by Ring members whether they have finance functions, what the priorities and expectations are from those functions and what they considered to be the key attributes of finance directors.

This survey focused on companies with more than eight employees, based in the UK and not recently acquired. The intention was to see whether there were any trends and/or useful insights that of benefit to CEOs of other Ring companies. Most of the companies surveyed had less than 20 employees; there were a few larger companies where the finance function was more established.

Structure and activities

Most companies had some sort of in-house (ie, employed) finance resource, even if this was only a part-time book keeper to handle basic transactions (recording expenses, costs and revenues, making payments and collecting cash). A number of smaller companies had a full-time internal book keeper and a part-time finance director. One company with international interests and over 30 employees outsourced all accounting functions.

Most activities — from transactional processing, such as invoices and sales orders, to the more "value add" activities such as monthly management accounting, preparing board packs, analysis and forecasting — were done in house. In many smaller companies, the CEO was often responsible for human resources and the management of banking relationships and facilities. Legal matters were also either handled by the CEO or outsourced to third parties, although larger companies had their own in-house lawyers.

External firms of accountants were usually only used for the statutory audit and year-end accounts preparation/lodgement as well as tax compliance, preparing and lodging the tax returns. For larger companies, they also provided a range of advisory services and, for AIM listed companies, support on governance issues.

Hiring an internal finance person

Companies were asked at what point they decided to hire their own finance resource. Responses included:

- "Second employee — founder's time too valuable to complete VAT returns"
- "Preparation for a float and the required reporting"
- "Advised to get an FD to add credibility during fund-raising"
- "Once sales supported the cost and overheads were sufficient to need financial support"
- "Large revenue and complex finances"
- "Six months after start up; but I should have done this earlier as I needed not just historical information but also business planning and modelling"
- "We first hired a financial controller when we needed stronger cash management and reporting; moving up to having a financial director let us look forward too"
- "On day one"

Another CEO commented that, in the early days, he had outsourced all book-keeping functions, but when the costs rose to the point where it was roughly comparable to hiring an internal resource, the company hired a very experienced full-time finance director who was hands-on and responsible for everything. Although this was rather a leap at the time, in retrospect it was very much the right decision for the company.

Another company had started with outsourcing, moved in-house to set up controls, processes and systems during the first growth phase, and had then moved back to outsourcing.

Although the transition point was impossible to average, one seasoned CEO advised that the issue becomes prevalent once revenues are circa £1 million and headcount reaches 15 to 20. At that stage, a good mix is a full-time book keeper and a non-exec, part-time Finance Director.

Priorities and Expectations

Survey questions focused on the priorities of the finance function and whether they were being met. One CEO's response was all-encompassing: "all day-to-day financial matters, financial planning, financial reporting, buildings management, any M&A work, and sitting on the board to contribute to the wider business affairs of the company."

Priorities cited by most CEOs included:

- Planning, forecasting and checking progress on actual to planned results;
- Monthly management accounts and providing a solid and accurate view of the company's financial status;
- Cash management, particularly control of the accounts receivable ledger (ie, collecting cash on a timely basis from customers);
- Strategic positioning and advice, and structuring deals and the business to the benefit of the company.

Only one CEO commented that keeping costs under control was a priority, although it is possible this was implicitly assumed by others.

A number commented that many finance activities were taken for granted, such as accurate day-to-day processing, management reporting and good cash management (ie, managing debtors and creditors, ensuring invoices were sent out on time and optimising the cash position). In fact, many activities were perhaps invisible, but it was recognised that these were the foundations of any good finance function.

Another CEO advised that, as a company director, there were certain statutory and legal responsibilities that must be adhered to, as the consequences of failure were too severe. Therefore one of the priorities of his finance function was to ensure compliance.

In larger companies, CEOs' priorities were focused on the value add activities such as planning and modelling business scenarios. For one larger company, the CEO advised that business partnering was also a significant part of the function's day-to-day activities. The recurring trend was that the larger the company and finance function, the greater the expectation for value add services from finance — for example: strategic input; commercial input; and business planning. During start-up, a company often only needed a book keeper. There many reasons for this: cost constraint; level of complexity; the volumes of transactions did not warrant more; and perhaps a lack of awareness, in the early days, of what a good finance function could and should be doing.

Several commented that, where a VC investor was involved, the monitoring and control aspects of a finance function were much more important, and more rigorous, detailed reporting was required. There was less room for error if an investor was involved. Therefore, co-ordination and liaison with the investors were also a priority for some CEOs.

In conclusion, priorities were being met although one commented that the planning was not as sophisticated and as flexible as the business needed.

Challenges

Apart from priorities, CEOs were asked if they felt their finance functions had specific challenges, and whether there were any gaps between their expectations and actual performance. While most companies responded that they were not aware of any specific challenges, those that were cited included:

IT systems (including using an inadequate finance package) and integration of the finance system to other business systems;

Resourcing (in one case it was commented that the function had not been well staffed, and fewer higher calibre people would have been more effective);

- Cash collection;
- Moving to IFRS (international reporting standards);
- Continuing legislative burdens;
- Structuring deals;
- Raising finance;
- Growing in a controlled manner and coping with growth;
- Dealing with international and multiple currency accounting;
- Reducing time needed to deal with "noise level" tasks.

One CEO commented that one of the challenges for his finance team was to avoid being bullied by customers, while also dealing with the arrogance and incompetence displayed by his suppliers!

When asked if there was anything the finance function was not delivering that would be helpful, responses included:

- Activity-based costing — that is, understanding which parts of the business do and don't make money;
- More real-time KPIs (key performance indicators) and getting those KPIs in the timeframes and formats required;
- A more flexible mind-set and a greater willingness to support new initiatives.

Performance

Respondents were asked to rate, on a scale of 1 to 5 (where 5 = very satisfied), the performance of their finance functions in the following areas:

- Board and management reporting;
- Cash management;
- Commercial (eg, sales support; contract negotiation; supplier negotiation);
- Forecasting;
- Being part of the business (eg, visibility; ability to communicate to non-financial people).

Most CEOs rated their finance functions 4 or 5. The areas that had lower ratings were generally commercial and forecasting. However, overall CEOs were happy with their finance teams and felt that they added value and that they were well regarded in the business. Only one CEO felt his finance function was not as supportive as it could have been.

Attributes of a finance director

The other pertinent question focused on the attributes sought in a finance director. Specific comments included:

- "If a venture capitalist is involved, the financial director must be impressive and be respected by that team"
- "The financial director is a complementary resource to me and keeps me on a steady course — he is my friend on the inside"
- "Making sure I am a good CEO"
- "Desire to be a good CFO, not an aspiring CEO"
- "Must be able to understand the business quickly and present options and advice"
- "The ability to communicate to people such as investors and to be perceived as a safe pair of hands"
- "Integrity, honesty, openness, no hint of fabrication"
- "Ability to offer strategic as well as financial input"
- "Thorough understanding of the operational as well as the financial side of the business and that interaction"
- "They must understand that finance is integral to the success of the business and it is a dynamic, real time function, not a back office function. Finance must help run the business, not just support it"
- "Domain knowledge (eg, the customer market sector)"
- "Deep experience in corporate finance"
- "Direct experience in high-growth software businesses'"
- "Negotiation skills and helping optimise deals"
- "Spot, hire and retain good talent"
- "Personable and able to interact with the team"

Recurring themes mentioned (perhaps more pertinent to priorities) were:

- Cash collection
- Cost control
- "Getting the accounts out on time — basic goal"

Words such as reliable, loyal, numerate, articulate, capable, intelligent, well-organised and attentive to detail were common. Other attributes mentioned, which were perhaps even more pertinent to smaller companies, were: a proactive approach; the willingness to get one's hands dirty; and to be able to cope with multi-tasking in a busy and changing environment. It was commented that start-ups were often frantic and under resourced, and not everyone can cope with that type of working environment.

As one seasoned CEO put it, "attributes are dependent on the size of company: different skills are needed at different stages of the company's lifecycle."

Incentives

In terms of incentives, most companies offered employees working in finance some sort of incentive. This was generally a discretionary share of a company-wide bonus, or a bonus linked to company profit. The level of complexity was linked to the size of the company surveyed. For one company the incentive was linked to contribution performance for the group finance function, and specific local results for the local finance teams. However the exact bonus paid was also dependent on performance against individual goals. For another larger company the bonus was approximately 20% of the overall package and was a mix of company financial targets (such as invoicing) and personal objectives.

One company was finalising long-term incentive plans which were expected to include cash and shares and be linked to earnings per share. A small number of other companies also mentioned share options. For one company using the services of a part-time finance director incentives were not considered relevant, although some share options had been issued.

Conclusions

The role of finance in any company is a fluid concept. Roles and responsibilities can range from basic transactional book-keeping to a function that is responsible for supporting and challenging the CEO, helping drive strategic vision, negotiating customer and supplier contracts, and taking responsibility for all non-customer-related activities such as internal technology infrastructure, human resources and legal matters.

Resources can be in-house or outsourced, full-time or part-time. There is no one "right" model of who is responsible for what, or ratio of finance resource to revenues/company employees. Much of the book-keeping can be outsourced; however there is less control over accuracy and speed of response (as the company will be one of many clients to an outsourced function). The best model for any company should always be individually considered and the structure should be driven by the unique needs of each business, at that point in time, in light of transactional complexities/volumes, shareholder and management needs, resources, skills, and cost constraints. One recurring theme for smaller companies is the concept of a full-time book keeper and a part-time finance director. This provides the company with needed experience but not an unsupportable cost, and provides all parties concerned with some flexibility.

At a minimum, someone is needed to process transactions in an accurate and timely manner. This can be perceived as not being "value add" but is a fundamental necessity. Unless the burden is minimal and cost control very sensitive, it is not recommended that the CEO performs this task. The mind-set required is quite different, and it is probably not the best use of the CEO's time. Bear in mind that a transactional finance person will not necessarily have the skills/experience to provide "value add" services such as board packs, analyses, forecasting models, etc. Equally, a finance person used to a more strategic role may not be happy, and get bored with, transactional processing. It all depends on the individuals involved. The issue circles back to the need to assess what is required and ensure that the right people are hired for the right roles.

If external funding is sought from investors they will expect a finance controller/director. Even if the business is small, investors need reassurance that their investments are in safe and steady hands. They often look to the FD for this reassurance rather than a more entrepreneurial and creative CEO. Their needs and expectations will be more rigorous in terms of control, monitoring, reporting, analysis and forecasting. This must be someone in whom they can have confidence. Attributes looked for by investors are: experience; ethics and integrity; the ability to tell the truth; and to dance along the barbed wire fence separating investor needs and expectations from CEO needs and expectations, as they are not always completely aligned.

Assuming the basic book-keeping is in place and being handled satisfactorily, the "value add" activities usually performed by a finance function (eg, analysis and planning) are a matter of need, desire and compromise. Who needs what and when, and what is the optimal way to provide this? Each answer will be slightly different as indeed is each business.

Auriel Folkes is a seasoned interim/part-time finance director focused on technology companies. She can be reached at auriel@ltnweb.com if there are any questions. In the next edition, she writes an article on her own views of what to expect from a finance function.

Ed Scadding

Ed Scadding, who graduated from Queens' College in 2006, found that consultancy provided the variety of challenges he was looking for.

I graduated from Cambridge in 2006, scarcely able to believe that my time there had come to an end so quickly. Like many students I had ignored the slowly-advancing deadline of my graduation, convinced that it would never arrive. Having studied Maths for three years and Computer Science for my final year, while also fostering pretences of being a musician, there seemed to be a bewildering number of options to choose from. Looking at what friends were planning to do next only increased my dilemma — did *I* want to try my hand at a computer science PhD, a neuro-imaging master's, or music college? Or would it suit me best to get (shock, horror) an actual job?

Realising that what I needed was a variety of challenges steered me towards consultancy. However, having taken part in a "taster" session for one of the larger consultancies, I knew that while the work seemed interesting I didn't want to feel like a mere number on a spreadsheet, or a worker ant!

This led me to Detica, a successful and growing business and technology consultancy — in many ways one of the industry's best-kept secrets — that specialises in helping government and commercial clients collect, manage and exploit information to reveal useful intelligence. Having spotted the company at a Careers Service event, I was impressed by the bright, motivated people as well as the company's focus on the individual, allowing your aspirations to be taken into account even in the early stages of your career.

I joined the business as a technical consultant and immediately found the subject matter fascinating — I was constantly wide-eyed for the first few weeks! My first role was working on the management information component of a system for a key client. To begin with I was pestering other team members with an unending stream of questions, but I soon got into the swing of things and it was only a couple of weeks before I was put in front of the client to explain what I'd been working on.

Since then I've had several roles. I first moved to a J2EE development position on a project using model–driven architecture (generating partial source code from a rich UML model), which involved learning a lot of different technologies very quickly. As the project progressed from prototype to production and other developers came on board, I became the team lead which allowed me to start developing leadership skills very early on in my career. This meant that I had to balance my usual development work with mentoring developers who were new to the project and managing team resources. I also gained experience in other parts of the development lifecycle, such as requirements gathering and analysis. While this did bring a greater workload it was a challenge that I very much relished, and I was grateful to have been trusted with such a responsibility.

I'm currently working on another development project which requires me to split my time between the office and the client's site, with an extended team combining Detica employees and members of the client, as well as other consultancies. The project will bring large-scale architectural changes to the client's business, so it is an exciting and educational one to be involved in.

As Detica has grown it has managed to retain the "small company" feel. This is partially due to regular social events (like free cinema trips, sports clubs and the legendary "Thirsty Thursday" social evenings) and the informative "tech forums" featuring visiting expert presenters, but mostly thanks to the openness and approachability of those in charge and a highly professional and collegiate culture. It's these qualities and the rewarding work that make me feel lucky to have spent the first three years of my career at Detica.

Detica is recruiting, with vacancies for graduates, students and experienced hires.

For more information and to apply, visit www.detica.com/careers or e-mail cambridge@detica.com.

Don's diary

A day in the life of **Dr Simon Moore**, Reader in Computer Architecture.

7:00: I kick off the day with my "Dad" hat on and cook breakfast for my family. My three-year-old son would like scrambled egg for every meal. The school run operation finishes for me at 8:30am when my son is installed in the bike trailer attached to our child-backed tandem; my daughter ,who is 6½, is the stoker and my wife is the captain.

8:30: Time to clear some e-mail and write some more Bluespec SystemVerilog for my new masters-level Advanced Computer Design course that I'll be teaching in Lent term. My self-imposed task is to produce a virtual channel router design and MIPS-64 style processor in Bluespec as design examples. I plan to download the design to 36 FPGA boards mounted on a hexagonal structure made of laser-cut MDF which I like to think of as my 'MDF Cray' but the summer students, who helped build it, called it 'The Dalek' — imagine a Dalek wrapped in Christmas tree lights and you'd not be too far off the mark!

Currently I have a problem programming the boards on the Dalek — Altera's programming tool takes $O(n^2)$ time to program n boards and it looks like Altera hasn't had a customer try to connect so many FPGAs via USB before. I was down at Altera in High Wycombe on Wednesday reporting back on progress by Altera-sponsored summer interns, and while I was there I managed to get somebody sufficiently worked up about the programming issue. They have kindly investigated the problem and I exchange some e-mails with them discussing options.

10:30: A quick cycle ride into the Lab where the atrium is being cleared after a very successful industrial supporter's club recruitment fair. Now it is time for individual meetings with two of my nine PhD students. It never ceases to amaze me just how varied the approaches and thought processes are from one student to the next, and I enjoy the meetings.

On previous Fridays in term I was lecturing at noon but I gave my last lecture of Computer Design on Wednesday, so I have time to talk with my colleague Andrew Moore about four referees' reports of an EPSRC grant that we have submitted. We want to look at the systems-level implications of chip-to-chip photonics and the research method we propose is rather unusual. The referees that "get it" give us much praise. As usual there is one who is confused, but at least he has contradicted himself, so we stand a chance of defending the grant application. I've done quite well with funding, having brought in £1.4m last academic year, but I foresee difficult times ahead.

12:30: I dash into College to finalise undergraduate admissions and have lunch. Back to the Lab for 13:50.

14:00: A visitor, Professor Rose, arrives. I think that the receptionist was expecting a lady, but this Rose is a Canadian ice hockey player who has just finished his term as head of department in Toronto, and is on sabbatical at Imperial. I show Jonathan around the teaching lab, where our second-year undergraduates are designing hardware for FPGAs and programming "the metal". I normally run the Friday lab, but my colleague Robert Mullins kindly swapped with me. Jonathan seems quite impressed by how able our second-year students are.

After much debate about research directions, Jonathan heads over to Microsoft Research

16:00: I do some planning for a meeting with Professor Furber, with whom I am collaborating to build a 1-million ARM processor machine to do massive neural simulations.

17:00: The Lab Happy Hour has started; a great opportunity to chat informally with my group and others before heading home and donning my "Dad" hat for the weekend. Perhaps tonight I'll avoid doing some late-night hacking of Bluespec — higher-order and generic types seem to give me (as a hardware engineer) strange dreams!

Dr Simon Moore is a Chartered Engineer, a member of the IET and has recently been made a Fellow of the BCS.

INTELLIGENCE IS EVERYTHING.

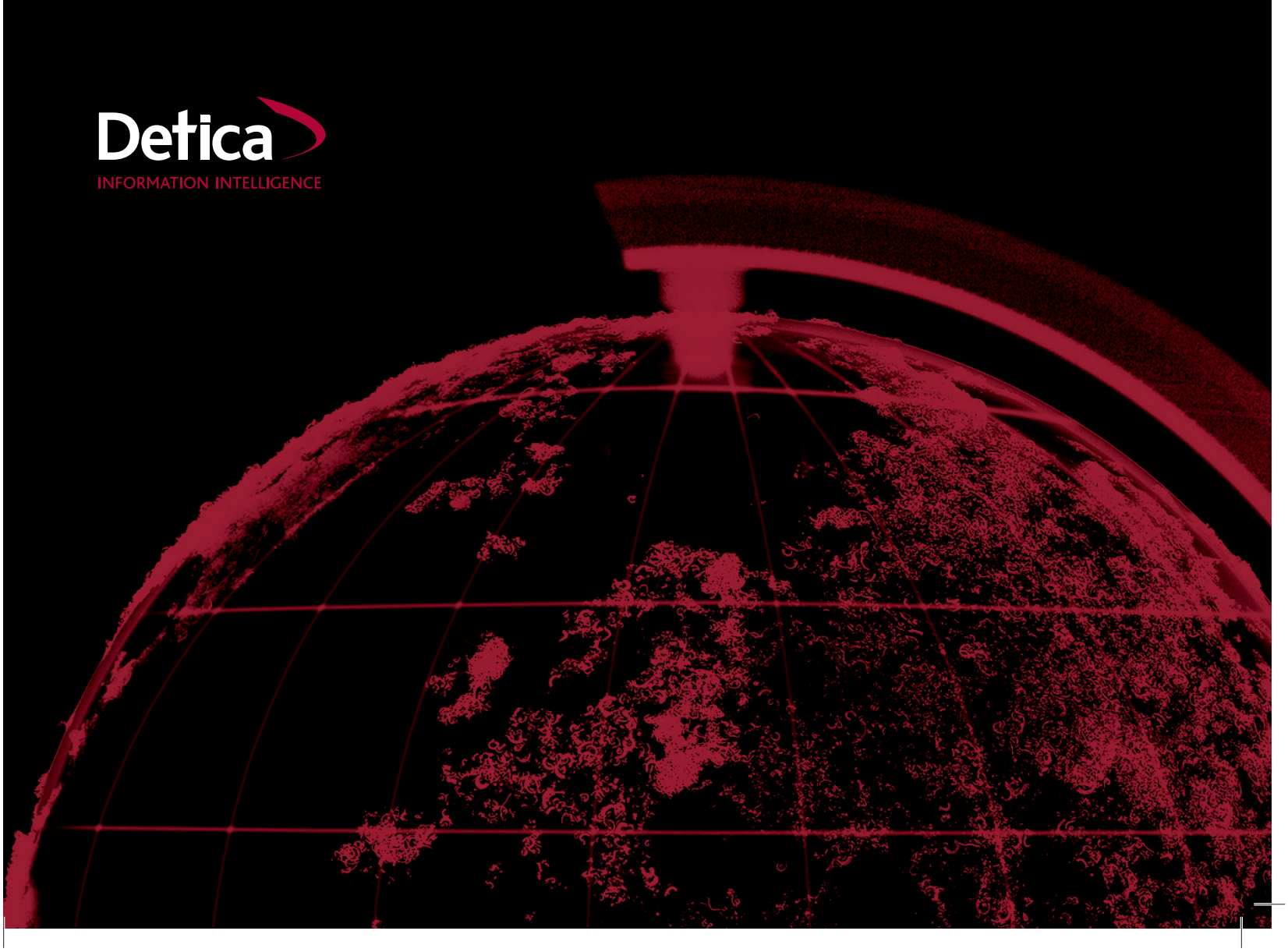
TECHNICAL CONSULTANTS
SOFTWARE DEVELOPERS
ELECTRONIC ENGINEERS
DATA ANALYSTS
BUSINESS CONSULTANTS

At Detica, we're specialists at making the complex simple. We're a business and technology consultancy that collects, manages and exploits information to reveal intelligence that literally changes organisations. We work with government bodies and commercial firms. We help the Ministry of Defence strengthen homeland security and protect cyberspace. We work with international banks to detect serious fraud. We give telecommunications companies valuable customer insight. In fact, we've been developing solutions to some of the world's most complex and sensitive security problems for over thirty years.

A lot of what we do is niche. And we're expert at it. What we're not, however, is corporate. Or bureaucratic. We're an organisation that values intelligence, that respects individualism. This year we'll be looking for the country's best graduates to join us. If you're one of them, you'll start as a consultant or electronic engineer and immediately begin working with clients to develop bespoke solutions. You won't find yourself on a graduate conveyor belt, you'll shape a career that is all yours, developing the skills that you need, and want, to develop. Because at Detica, what makes you different, is what makes you right.

Discover more, visit www.detica.com/careers

Detica
INFORMATION INTELLIGENCE



Computer Laboratory news

Honours and Awards

Dr Simon Moore, Reader in Computer Architecture, has been made a Fellow of the BCS, The Chartered Institute for IT (formerly known as the British Computer Society).

Mohan Ganesalingam has been elected to a Junior Research Fellowship at Trinity College for his thesis on "The Language of Mathematics".

The Computer Science Tripos

This is the second year that Computer Science has been available as a bench subject within the Natural Science Tripos Part IA. As a result, the intake has risen from twelve to sixty. Feedback to the Computer Laboratory has indicated that most NST students who took the subject last year enjoyed it, and it was pleasing to see that this cohort outperformed those taking other bench subjects. After taking the Natural Sciences subject Computing in the first year, students can still — with some summer reading and at the discretion of the Directors of Studies in Computer Science and Natural Sciences — change into mainstream Computer Science for the second year.

From October 2010, the Linguistics Tripos will be adding a first-year course.

Plans are currently being developed to introduce a fourth year to the Computer Science Tripos. The course is being designed for existing Cambridge students, who would require either a I or a good II.1 in Part II to proceed to Part III.

Masters Courses

The MPhil in Computer Speech, Text and Internet Technology is being run for the last time in 2009/2010. Some of the modules will be incorporated into the new MPhil in Advanced Computer Science for the October 2010 intake.

Thirty-one applications for the MPhil in Advanced Computer Science for 2010/11 have been received to date. This compares with 12 at the same stage in 2008. It is planned to limit final admissions to 50.

Computing for the Future of the Planet

The Computer Laboratory has invited applications for a University Lectureship to support the on-going development of the Large Research Initiative in Computing for the Future of the Planet, and to support the MPhil Degree course in Advanced Computer Science.

The development of a sustainable planet is one of the most important challenges facing the world, and computer-based tools form a crucial component of many solutions. The problem is that many of these tools do not yet exist.

Computing for the Future of the Planet is a research perspective which has been created in recent years at the Computer Laboratory to address this issue. The research has explored four themes: optimal digital infrastructure; prediction and reaction; sensing and optimization; and digital alternatives to physical activities.

The successful candidate is expected to take up appointment on October 1st 2010.