

The Ring

THE JOURNAL OF THE CAMBRIDGE COMPUTER LAB RING

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Ring news

Letter from the Editor

As many of you probably know the Computer Laboratory's graduate association, Cambridge Computer Lab Ring, is open not only to all graduates and present and former staff of the Computer Laboratory, but also Cambridge graduates from other disciplines working in computing careers.

While many in industry throughout the land and far beyond bemoan the lack of computer science graduates, the relentless growth of new technologies has served to attract a diverse cadre of the most capable graduates from other disciplines. Indeed, the Computer Lab Ring's founder Stephen Allott, himself a law graduate from Trinity, got into technology because "I was fascinated to find out how it would make work easier and more productive."

In a letter to *The Ring* (No XXIV) William Bailey (CL Dip68) wrote "In the olden days...a computer science qualification was a rarity, and seen as a useful baseline skill not only for IT management but indeed for any other IT job. Today, with core IT expertise very widely distributed, this base expertise is perceived as fully adequate for all except the most technical roles, and computer science graduates are not essential."

In this edition of *The Ring* we meet some of those Ring members from disciplines other than computer science. Like Stephen Allott, Anna Lewis read Law. However, she shunned the traditional routes of a law graduate for the world of on-line publishing (page 6). For Anna, "the pace of change is so rapid in technology that it felt like a much more exciting area to be working in."

In contrast with his fellow economics graduates, Julian Hall eschewed the traditional path to the City and instead took up an industrial placement at IBM. His time with a successful start-up in Auckland taught him "how malleable software technology can be" and he set his sights on staying in the industry. Julian has recently co-founded a company in Cambridge (page 8).

While Tom Howat's move into technology is perhaps more traditional (he does come from the STEM fields having spent seven years at Trinity reading applied mathematics and graduating with a PhD in mathematical biology), it was his programming ("I've been programming since high school...I love programming") that got him his job at Cantab Capital Partners in Cambridge, a hedge fund founded by fellow Cambridge Graduate Dr Ewan Kirk, where he is now a partner (page 11).

Departments of Computer Science will continue to work hard to increase the number of applications. However, we should be thankful that the industry continues to attract the brightest from other disciplines.

Events calendar

2013

February

Wednesday 6th, 6.30pm
London Ringlet Bar
 Venue to be confirmed

April

Thursday 4th, 6.30pm
London Ringlet Bar
 Venue to be confirmed

Wednesday 24th, 2.30pm
75th Anniversary Celebrations
 Computer Laboratory

11am Poster competition starts.

2.30pm **Wheeler Lecture**
 Speaker: Professor Sir Tony Hoare

3.30pm **Book Launch**
 Cambridge Computing:
 The First 75 Years

4.30pm **Innovation Lecture**
 Speaker: Dr Mike
 Lynch OBE, FREng

5.30pm **Innovation Discussion Panel**

7.30pm **Cambridge Ring Annual Dinner**
 Queens' College
 Guest speaker: Lord Broers

Tickets for the afternoon events are free though limited numbers are available.

Tickets for the dinner cost £57. Please make cheques payable to "University of Cambridge" and send them (with your e-mail address to Cambridge Ring, William Gates Building, JJ Thomson Avenue, CB3 0FD.

To confirm your place, please e-mail cam-ring@cl.cam.ac.uk with details of the sessions you wish to attend.

Who's who

Stephen Allott (T MA80) has been made an honorary member of the University of Cambridge Computer Laboratory.

Simon Beaumont (HOM BA12) is working for Citrix as a software engineer.

Gerald Cheong (T BA96) recently co-founded Mango Health. Based in San Francisco, Mango Health allows consumers to take control of their health with fun, elegant and easy-to-use mobile applications.

Omi Chowdhury (PEM BA12) has joined Identity Inc in New York as a lead user experience designer.

Peter Cowley (F MA77) has been appointed a non-executive director of Captive Media and a board observer at both Cambridge CMOS Sensors and e-Go Aeroplanes.

Sadly Captive Media's system can only be enjoyed by the UK's male population as it looks to take advantage of the average 55 seconds visit time the UK male spends in a urinal: it has introduced the world's first retrofit, networked washroom gaming system — with hands-free control!

Peter has also been appointed a board observer of e-Go (which is developing a light aircraft in kit and complete forms) and Cambridge CMOS Sensors (CCS). CCS is a spin-out from the University of Cambridge Department of Engineering, exploiting innovative patented technology jointly developed in collaboration with the University of Warwick in the area of CMOS micro-systems.

Neil Davidson (T MA95), Joint CEO and co-founder of Red Gate Software is to step down at the end of January 2013. Neil plans to take some time off before returning to university for full-time study. While he'll remain a major shareholder of Red Gate and will sit on the Council of Advisors, he will no longer be involved in the day-to-day operation of the company.

Dr Mike Edwards (T MA79) is a cloud computing standards expert at IBM Hursley Laboratories and is Chair of the UK BSI Cloud Computing Standards committee. He is also a strategist in emerging technologies at IBM.

Raoul Fleming (SID MA96) is working as a cloud business executive for Atos in Paris.

Martin Fulford (PET MA74) is working as a senior developer at Ubisense.

Richard Hadden (Q BA96) has recently joined Finance Wales. Finance Wales invests in SMEs in Wales.

Julian Hall (CHR BA97) has recently co-founded Skin Analytics (see page 8).

Roger Hill (JN BA85) is a senior consultant at C5 Alliance in Guernsey.

Dmytro Kislov (G BA11) is a technical director at Improbable Worlds.

Jonathan Miller (R BA98) works for Cartesian where he specialises in high-level requirements, project initiation and implementation of Revenue Assurance Controls. Jonathan is a contributing member of the UK's Revenue Assurance Group, whose members include most UK-based telecommunication Revenue Assurance Managers.

James Montgomery (EM BA00) has been appointed Director Test Engineering at Tom Tom in the Netherlands.

David Mrva (PET MPhil00, PhD06) is working in investment research at International Standard Asset Management.

Valerie de Paiva (PhD90) has been appointed a senior research scientist at Nuance Communications.

Larry Piano (CHU MPhil94) is a voice recognition consultant at Abacii Services.

Phil Rogers (Q BA87) is a developer at IBM.

Andrew Wallace (EM MA84) has recently joined Tunstall Group where he is Chief Marketing Officer. Tunstall is Europe's largest supplier of Telecare and Telehealth services.

Murray Williams (K MA98) is an IT specialist at IBM.

Sarah Woodall (G DIP81) is working for Code Red Technologies Ltd as principal software engineer.

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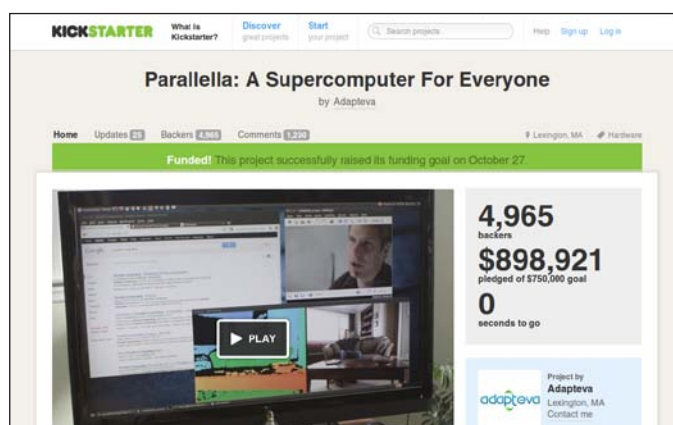
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The Ring is the journal of the Computer Lab Ring, which is the graduate association of the University of Cambridge Computer Laboratory.

Kick-starting Chip Design: The Raspberry Pi Effect

On 27th October 2012 Adapteva Inc. successfully raised nearly \$900,000 on the Kickstarter crowd funding Web site — the first Kickstarter success by a chip design company. **Jeremy Bennett** reports.



The Kickstarter money will be used to manufacture Adapteva's Epiphany multi-core FPU chip and put it on a \$99 board. Known as Parallella, the aim is to make "supercomputer" performance available to the mass market.

My company, Embecosm, has been working with Adapteva since 2009, developing its compiler tool chain. Although a US corporation, Adapteva relies on partners world wide, and its recent Kickstarter received particularly enthusiastic backing from the UK. Here I look at some of the innovative aspects of this project, and the implications for the wider chip design industry.

Conventional wisdom is that modern chip design costs tens of millions of dollars. Yet Adapteva is on its fourth generation of silicon, using industry-leading 28nm technology, but has required barely \$2.5m in funding. Indeed, the first silicon was paid for from the founder's savings.

And this is no ordinary chip. With 64 floating-point processors running at 700MHz and delivering 100GFlops in total, the latest version of Epiphany is comparable in performance to top end GPUs, yet draws just 2W power. Supercomputer power is now within reach of the battery-powered embedded marketplace.

The "Raspberry Pi" effect

With conventional seed funding, Epiphany processors have been available commercially for nearly two years. Adapteva Inc has been making a steady income selling development boards at around \$10,000 each to the defence and other high-value markets.

The challenge for Adapteva is to become a mass-market processor. Intelligent engineering meant Adapteva could develop its silicon for a fraction of the usual cost. Yet there was no way, as a four-person company, for it to compete with the conventional marketing budgets of established chip companies.

In facing this marketing challenge, Raspberry Pi gave inspiration. Conceived as a teaching platform on a tiny budget, Raspberry Pi has found worldwide adoption as the prototyping platform of choice for embedded applications. In less than a year, nearly 1 million units have been shipped and, more importantly, many alternatives have seen their popularity rise.

While there may not be many hobbyist/hackers/prototypers out there, reducing costs, ready availability of components over the Internet and ever improving software and tutorial material mean their number is growing. But far more importantly, in a world of social media, these people are opinion formers. They produce the magazine articles, blogs and YouTube videos that the mass market now relies on.

Furthermore, with so many users, Raspberry Pi has found applications its designers never conceived of. The point is that the larger the crowd, the greater the chance of innovation.

Inspired by this, Parallella is nothing less than a "supercomputer" version of Raspberry Pi. Developers from all walks of life will find new applications where massively parallel low-power floating-point computing has value. Already developers of software defined radio, UAVs and white-space radio are looking eagerly at this new platform.

Open Source and Partnerships

Central to success of the Kickstarter funding was Adapteva's long-term commitment to Open Source. Back in 2009, we developed its GNU compiler tool chain, using pre-silicon Verilator models of the hardware. More recently, through its partners Brown Deer, Adapteva has developed a version of OpenCL and, unlike most versions, has licensed it under the GNU General Public License (GPL).

For Parallella, Adapteva has recognized that its company's value lies solely in its unique chip design. Everything else serves only to help sell that design. So all the board design, the chip interfaces and its documentation is being made freely available. The mass of developers should feel no restriction in what it can achieve.

Alongside this Adapteva has relied on partnerships, mostly with companies of similar scale, avoiding the "commitment challenge" a start-up can find using large suppliers. My company, Embecosm, is not much older than Adapteva and about the same size. When we agreed to build the GNU tool chain, it was our first major contract, and Adapteva knew our success depended on doing a good job for them.

Rather than a conventional, detailed contract, Adapteva told us how much they could afford, and their priorities and let us show what could be achieved. That made us work very lean. We delivered a working GNU debugger in just three weeks. Our first GNU C compiler (GCC) was delivered with just two outstanding regression failures in just six weeks. As both companies have grown, we have done more. Thanks to Embecosm's GCC, code on Epiphany has pipeline occupancy that is the envy of the competition, reflected in published performance benchmarks. The value of any modern processor depends on its tool chain and, by working in partnership, we have ensured the Epiphany processor has one of the best there is.

But there is now a much more important partnership — the community of Parallella backers. Being small, Adapteva must build a community that is largely self-supporting. Existing partners like Embecosm and Brown Deer are helping, by taking complete ownership of their parts of the ecosystem.

To pull all this together, Adapteva has brought in a specialist to help. Andrew Back of AB Open leads the UK Open Source Hardware User Group and is a former Open Source evangelist for BT. Through advocacy, connecting people, organising and providing resources, he will enable the Parallella community to grow and be a success.

What Could Possibly Go Wrong?

Kickstarter is not a magic bullet. Although backers are not equity investors, they still have to be kept involved and informed. Having built up a community through the fund-raising process, that community needs to be sustained as the product is developed.

And Kickstarter is not the cheapest source of funding. It takes 5% commission, and the Amazon payments system for backers takes a bit more. So \$900,000 raised translates to more like \$800,000 in Adapteva's bank account.

Then those backers have been promised Parallella boards — multiple boards for big backers. Adapteva has to produce around 6,000 boards and it will be a challenge to get manufacturing cost much below the target price of \$99. So Adapteva will have just \$200,000 to fund all its other needs — its staff, its partners and community support.

The Future

Adapteva's primary objective is to find a big investor to take the momentum from Parallella and make the Epiphany processor a mass-market product. Investors will be looking for innovative applications, which with nearly 5,000 developers will abound. Success for Adapteva will underline the attractiveness of crowd-funding to future chip designers.

For Adapteva's partners, the success rubs off. Embecosm's role developing the high performance implementation of GCC for the Epiphany chip has served us well in finding new customers.

If you didn't invest before 27th October, there is almost no way to get a Parallella board in the short term. Adapteva is focused on shipping boards promised to its backers by May 2013.

However, as a major backer, Embecosm has several Parallella boards. I am happy to make some of these available to anyone who has a really good idea of how they could be used. E-mail me with your suggestions.

Dr Jeremy Bennett is Chief Executive of Embecosm (www.embecosm.com) which provides open source services, tools and models to facilitate embedded software development with complex systems-on-chip. Contact him at jeremy.bennett@embecosm.com.

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Valobox



Anna Lewis (Q BA06) eschewed law to co-found a company making any content within books as easy to access as a regular Web page.

TR: Anna, you're among the cohort of Ring members who are Cambridge graduates from other disciplines (Law in your case) now working in technology. What prompted you to reject the traditional path of a Law graduate and instead move into on-line publishing?

AL: Although the law does evolve and change, the pace of change is so rapid in technology that it felt like a much more exciting area to be working in. There's so much scope for you to push boundaries and develop new business models. The idea of creating something new to help solve a problem was very appealing.

TR: Can you tell me about your latest venture, ValoBox? Did you see it as complementary to your first start-up, the on-line publication platform CompletelyNovel?

AL: Yes. ValoBox actually grew from a feature we were working on for CompletelyNovel. We were looking into how our users could make their books available as e-books but we didn't like the way that the current e-book formats kept their content totally separate from the rest of the Web. As we were developing our on-line reader, we saw that the solution we were building was actually something that would be really useful for other publishers so we started developing it as a separate product.

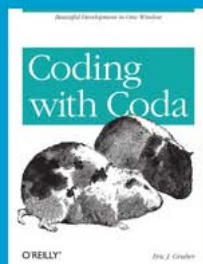
TR: How does ValoBox work? Can you tell me about the work you've been doing in the content API arena?

AL: ValoBox was designed to make paid content Web-friendly — accessible and shareable. It works by converting standard (ePub) files into Web-streamable books so they are easy to discover, read and mash up. It splits the book into small purchasable chunks and streams them into an HTML5 reading app. For users, this means they can access books directly through their browsers and pay for the specific parts they are interested in — handy if you need to read a chapter of an expensive textbook in a hurry. ValoBox aims to be accessible to readers and app developers. We have built three APIs to help mash-up ValoBox into other applications and Web sites. The embeddable reader has a client API which makes it easy to create new interfaces. You could, for example, display relevant comments or questions next to parts of a book. There is also a simple API to query and retrieve metadata which makes it easy to find appropriate content or link books. Finally, a publishing API enables anyone to publish content to ValoBox.

As ValoBox is designed to work with a community of readers, publishers and developers there is no traditional retailer so we credit whoever shares/embeds the book with 25% of any sales. This creates an interesting extra dimension to using our APIs.

Nerd core

We've got the finest books to help you learn to code. All available with full-text search and highlighting. You can buy any individual chapter or page.



TR: To most of us, publishing seems to be a closed world; retailers use digital rights management (DRM) to lock content while DRM locks customers into a platform. How does ValoBox help readers?

AL: The one platform which is accessible to pretty much everyone is the Web. We're firm believers in using Web standards as much as possible to give people access to the information they need. So there's no need to download specialist software or view books on a particular device — all you need is a Web browser. It makes the process of finding and buying content much quicker. All the books can be indexed by Google, appear in search results and be accessed within a couple of clicks. This also means that readers can take advantage of on-going developments in browser technology such as HTML5, rather than needing to upgrade their reading devices.

We're particularly interested in looking into specialist content that is used by academics or professionals. At the moment it is often a choice of either paying really high subscription fees to have access to much more than you will ever need, or no access at all.

TR: The majority of publishers insisted on DRM before they'd commit their content to the e-book format. Who are your primary publishing partners and how can you get publishers to test the DRM-free space? What is the value of shifting the industry to a more open model?

AL: We've tried to be sensitive to the needs of publishers and authors so access to ValoBox books is still carefully controlled. We do this through more commonly accepted Web methods such as user log-ins. We also add a few other restrictions to what you can do with books which mean that it's not a big leap for publishers. Some of our publishing partners such as O'Reilly are really forward thinking when it comes to DRM free downloads so it was easy for them to support ValoBox. For publishers in general, the benefit of a more open model is that

their content can get more exposure and reach a non-book-buying audience. At the moment they are not just competing with other book publishers, but with many other sources of content, often free. People are still willing to pay for quality content but you've got to make it easy for them.

TR: You've said that your goal is to make accessing premium content as easy as accessing a Web page. After e-books, what's next for the pay-as-you-go model?

AL: We're particularly interested in looking into specialist content that is used by academics or professionals. At the moment it is often a choice of either paying really high subscription fees to have access to much more than you will ever need, or no access at all. That's not much of a choice. We'd like to see a half-way house which lets people who are not necessarily part of a large institution gain access to specific material that they need at an affordable cost.

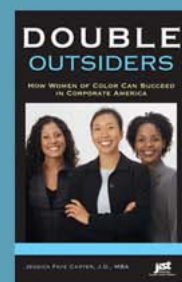
TR: Earlier this year you moved to San Francisco for three months. One of the things you said you'd learned was "Go big or go home". What did you decide? Are being big and being at home mutually exclusive!?

AL: I don't think those things are mutually exclusive, but there is definitely a push for scale in San Francisco, often over everything else, which was quite eye-opening. It's not cheap to hire developers, rent accommodation and generally set yourself up there, so I can see how it has become the norm to go for a large amount of funding even when you may not even have a business model. It's a brilliant, inspiring place to be and we plan to head over there again, but there's also a huge amount of opportunity on the UK front, so we're exploring that too.

For more information about Valobox go to www.valobox.com

Business

Get excellent business advice and expertise. ValoBox lets you access any part of any book in an instant.



Skin Analytics



Have you ever worried about a suspicious mole? Skin Analytics, co-founded by **Julian Hall** (CHR BA97), is a mobile health app to give you peace of mind.

When I graduated in 1997, the popular choice for an Economics graduate was to pursue a financial career in the City, but an industrial placement at IBM had got me interested in technology. I took a year out after graduation in New Zealand, and joined a small but highly successful start-up in Auckland, which became one of the big success stories of the technology sector down under. It was great fun and a great experience early in my career, and seeing how malleable software technology can be set my sights on staying in the industry.

After returning from New Zealand, I spent ten enjoyable years working for a financial software company, but felt it was time for new challenges. As I had mostly focused on managing technology teams I wanted to broaden my experience, so started an MBA at London Business School.

It was another great experience and it was there that I met my co-founders, all of whom shared an interest in both entrepreneurship and in doing something that could make a material difference to people's lives.

Skin cancer is the world's fastest growing cancer and mobile imaging technology offers one potential strategy in the early detection of the disease, so that's what we decided would be the focus of our start-up.

The idea behind our technology is quite simple. Early detection of skin cancer — and principally malignant melanoma, which is the deadliest type of skin cancer — is critical. The most sensitive marker of melanoma is a changing lesion. Early detection is key and public health agencies and cancer charities all advise people should be monitoring themselves for any changes in the size, shape or colour of their moles. So we are developing a cloud-based system that can analyse images of skin lesions, taken over time, and detect subtle changes which need investigation by a medical practitioner. We are solely focused on detection of change, rather than diagnosis, and in essence are looking to make the existing process of monitoring your moles simple and more effective.

It's been a very hard but rewarding journey so far. The challenges have been around fund-raising, recruitment, technology development, test data acquisition and regulatory concerns just to name a few! The key to overcoming these challenges has been two-fold. First we reached out to a fantastic group of advisors, based mostly here in Cambridge at the University, and they have been instrumental in helping us move forward. Second, we try to break down the challenges into component parts and not achieve too much in one go. We are constantly reviewing the most important challenges for our start-up, and tackling the top two or three at a time. That way we build up progress over time, rather than get stuck facing what appear to be insurmountable problems.

We are approaching the business model from two angles. One is to offer our service as a subscription offering to the general public. Effectively they would use us as a skin "image bank" whereby we would monitor their images for changes and notify them of anything that needs attention. The second is clinical application, whereby we would integrate our technology into providers of skin lesion screening systems. To the best of our knowledge — and according to recent research in *Artificial Intelligence in Medicine* journal — no-one to date has successfully developed a fully automated skin lesion change assessment system. So we believe there are multiple applications of our technology.

We are still in the technology development stage, but we are very confident we have cracked the majority of technical challenges. We have taken a completely new approach to the recognition of change in time series images of skin lesions, and fortunately so far it appears to be working well. We have built our cloud-based back end, integrated it into our algorithms and recently filed a patent for our technology. Subject to testing, user feedback and regulatory approval, we hope to launch next year.

For more information on how Skin Analytics helps you track your moles and detects changes go to: www.skinanalytics.co.uk

Hall of fame news

Bango

Bango has won Best Pay By Mobile Company at the Mobile Entertainment Awards 2012.

Bango was also given “Highly Commended” in the Most Effective Mobile Payment Solution category at the EMMAs and won The Best Technology Award at the AIM Awards.

Bromium

Bromium has released vSentry which protects desktops without requiring patches or updates, defeating and automatically discarding malware, and eliminating costly remediation.

vSentry is built on the Bromium Microvisor™ — a security-focused hypervisor that automatically, instantly and invisibly hardware-isolates each vulnerable Windows task in a micro-VM that cannot modify Windows or gain access to enterprise data or network infrastructure.

Cronto

Raiffeisen, a leading Swiss bank, is the first bank in Switzerland to offer Cronto's Visual Transaction Signing Solution as next-generation protection for its on-line banking customers. Available to customers today, CrontoSign will help to defend on-line customers from most advanced attacks poised by Trojan malware specifically targeting on-line banking.

DisplayLink

DisplayLink has closed US\$10.4 million of growth financing. The financing was led by Clydesdale Bank's Growth Finance team, which delivers financial support specifically aimed at high-growth, venture-capital-backed businesses with strong intellectual property. Existing investors Atlas Venture, Balderotn Capital, Cipio Partners, DAG Ventures, and DFJ Esprit contributed to the equity funding. The company will use the

funds for working capital to support strong growth of its semiconductor and software solutions business.

Embecosm

Embecosm's new application note “Howto: Implementing LLVM Integrated Assembler” is now available. Using examples from the OpenRISC 1000 implementation throughout, this application note will enable professional engineers to implement their own LLVM integrated assemblers.

The note may be freely downloaded in a wide range of formats from <http://www.embecosm.com/download/ean10.html>

Health2Works

Cheshire and Wirral Partnership NHS Foundation Trust have started to use Health2Works new Connect Web platform. The purpose-built CMS is now available for other Mental Health Trusts to use.

Jagex

Jagex has opened a new studio in California.

Carnage Racing is the studio's first title and marks Jagex's first foray into social gaming. It is a 3D multi-player racing game for Facebook. The game, which is being developed with Unity, promises to be graphically striking and will have a variety of vehicles, weapons and power-ups to put to the test on 3D racetracks.

Mango Health

San Francisco-based Mango Health has raised US\$1.45 million in seed funding to bring a new collection of consumer-focused mobile health apps to market.

Mango Health's first app aims to help people stick to their medication, as well as monitor information related to their meds.

Masabi

Masabi has been named a Longhorn (post Series A firm) winner of the 2012 Bully Awards honouring Europe's leading technology, media and telecommunications (TMT) companies.

A total of 60 European companies were named as finalists for the 2012 Bully Award and the winners were selected from a pool of entries that included hundreds of nominated European TMT companies.

Massachusetts Bay Transportation Authority (MBTA) and Masabi US Ltd have announced the launch of the US's first full smartphone commuter rail ticketing system.

Customers can now purchase and then display rail tickets and passes using the MBTA mticket app for iPhone and Android. Blackberry devices will also be supported soon. The tickets are displayed on the phone's screen as an encrypted barcode and as a human-readable ticket. The app can be found by searching for 'MBTA mTicket' in the Apple App Store and Google Play.

ObjectSecurity

ObjectSecurity has been awarded a multi-year research contract in the area of Intelligent Transport Systems (ITS). The project is titled “Intelligent Cooperative Sensing for Improved traffic efficiency” (ICSI).

ObjectSecurity will receive around EUR320k from an overall EUR4.5 million project budget part-funded by the European Commission.

The ICSI project tackles the problem that the current ICT infrastructure for supporting Intelligent Systems does not scale, is not flexible in supporting an incremental growth or changes of the ITS, and exhibits latency and security issues.

RealVNC

RealVNC has been ranked in the Deloitte UK Technology Fast 50, which recognises the fastest-growing technology companies in the UK. The Fast 50 is based on percentage revenue growth over the last five years, ranking RealVNC as the fastest growing software company in Cambridge.

Sophos

Sophos has been named a winner in the Security category for Sophos UTM 9 at CRN's 9th annual Tech Innovator awards ceremony. Sophos UTM 9 is the industry's first unified threat management specifically designed to integrate gateway security and endpoint security in a single hardware or virtual box.

Spektrix

The Lyric Hammersmith has developed an innovative donations tool on its Web site using the Spektrix API.

SwiftKey

SwiftKey has won the Recombu Best App 2012, beating Sky+, NetFlix and Hailo.

SwiftKey Healthcare won best consumer app at the #Appsters Awards 2012.

SwiftKey Healthcare is an intelligent keyboard product that offers unrivalled next-word prediction for clinicians. Built using real-world clinical notes data and powered by AI and Machine Learning techniques, it understands the words, phrases and terminology used by healthcare professionals and makes text entry on touchscreen devices fast and easy.

Ubisense

Ubisense has joined the Industrial Membership of the Manufacturing Technology Centre (MTC), a research facility that develops and showcases the most advanced production solutions shaping the future of British manufacturing.

Ubisense's Smart Factory solutions will be installed at the MTC's facilities at Coventry to demonstrate how precise real-time location systems improve manufacturing processes.

Hall of Fame Awards 2013

We are now accepting nominations for the 9th annual Hall of Fame awards, which celebrate the success of companies founded by Computer Lab graduates.

The awards ceremony will be held at Queens' College on April 24th 2013 when the winners will be announced by guest of honour, Lord Broers.

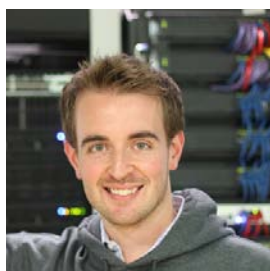
The award categories, along with the names of last year's winners are:

1. Company of the Year (Trampoline Systems 2012)
2. Product of the Year (Bango for the Bango solutions suite 2012)
3. Publication of the Year (Salvatore Scellator, Cecilia Mascolo, Jon Crowcroft and Mirco Musolesi for *Track globally, deliver locally: Improving content delivery networks by tracking geographic cascades* 2012)

If you wish to submit a nomination for any of the three categories, please send nominations, explaining why you have nominated the company/product, to cam-ring@cl.cam.ac.uk

Nominations close on February 1st 2013.

Graduate Story



Dr Tom Howat spent seven years at Trinity College, Cambridge, studying applied mathematics, and graduating with a PhD in mathematical biology in 2006. He then joined Cantab Capital Partners, a hedge fund in Cambridge, where he is now a partner.

"I'm not going to lie to you: this is a risky move." We're in The Eagle on a cold Wednesday in February 2006. We've finished our fish and chips, and now comes the hard sell. "You might not have a job in 6 months."

A mutual friend has put us in touch. I'm writing up my PhD thesis in mathematical biology. The man across from me, weary of early retirement after rising to partner at Goldman Sachs, wants to start a hedge fund. I have zero experience of finance, but I have some preconceptions: long hours in grey London offices, nameless shirt-and-tie cogs whirring away in cramped cubicles, labouring to please pin-striped elders in glass-walled offices. This is not appealing.

My mind shifts back to my office, to my computer models; on the draft chapter I owe my supervisor; on the nagging feeling that after almost seven years of university I still don't really know what to do with my life.

Then Ewan Kirk describes his vision to me. It confounds my preconceptions. No shirt-and-tie cogs, no pin-striped elders, no hierarchy of any kind. No cubicles. No grey London offices. "It'll be based in Cambridge." Open plan, academic, collaborative, rigorous, science-driven. "I want it to be a start-up technology company that happens to apply itself to finance."

This sounds like something I might want to do. But, as Ewan is at pains to make clear, it is risky. Many new hedge funds fail, for a variety of reasons: they may have difficulty raising assets, or fail to develop good models or systems, or maybe their performance doesn't live up to expectations. Despite the risk, or maybe because of it, I am interested. But there's a problem, or so I think.

"I don't know much statistics. Or probability. Or, in fact, any finance whatsoever."

"Not a problem. You'll pick it up as you go along."

Um, OK. I'm invited to interview a few weeks later. I'm still making plans for a post doc in America, because I'm worried that my gaping

ignorance of finance might put a spanner in the works. But the Maths Tripos has given me a good grasp of mathematics, and I've been programming since high school: first Basic, then Pascal, then C++. I've spent countless hours programming for fun, or in summer jobs. Voice recognition tools, games, Web sites, a database server, a factory floor scheduler. I bring a 3D fractal generator on my laptop to show my interviewers, hoping it'll distract them from the fact that I don't know what a financial future is.

I love programming. Programming got me this job, and allowed me to succeed in it.

I joined Cantab Capital Partners, the hedge fund Ewan started in Cambridge that summer, on its first day in September in 2006. True to his word, no financial knowledge or experience proved necessary. Over the following six years, we'd grow from seven people to 40. We still have no hierarchy. No cubicles. Instead we have a games room. Annual holidays to Venice, Lisbon, Monaco. Free Friday food. And my knowledge of finance? I picked it up as I went along.

Cantab Capital Partners is a systematic global macro hedge fund. We develop mathematical models which determine what positions we should take in global markets, and execution algorithms which enter into them. We decide which models make the cut, but after that, the computers make the decisions. This is what makes us systematic. We trade assets around the world, picking out trends, interest rate differentials, yield curve changes, sector correlations. This large scale approach is "global macro".

Our 20 or so researchers, with backgrounds across the quantitative sciences, coalesce around interesting problems or tasks, according to their own interests and strengths. We fall roughly into two groups: programmers and quants. Programmers focus more on computational problems, like execution, connectivity, data, infrastructure. Quants are more concerned with mathematical problems, such as model

development, risk control, portfolio construction. However, we're not pigeonholed: everyone falls somewhere on the spectrum between these two extremes.

That said, I'm really more of a programmer. I love programming. Programming got me this job, and allowed me to succeed in it. My C++ and design experience lent itself naturally to the bespoke language in which much of our work is done. I started alongside one other programmer; more followed. The CTO and co-founder, Erich Schlaikjer, gave us a fairly broad remit: write the infrastructure required to run a systematic hedge fund. Time to roll up the sleeves. In six months, we were ready.

The week of our planned launch, the Chinese government intervened in the markets, causing stocks worldwide to plummet. Billions of dollars of wealth were destroyed, battering many of our competitors. Hardly auspicious. We delayed a week, waiting for the dust to settle. On 8th March 2007, crowded around Ewan's computer in our office on Station Road, we launched our flagship product, managing \$30 million of our investors' money.

A lot has happened since then. In the US, the housing bubble, long inflated by lax lending, burst spectacularly, kicking off the credit crunch, where banks refused to lend to one another over fears of their exposure to bad mortgages. Lehman Brothers collapsed under the weight of this sub-prime debt; other big banks were sold for pennies, or bailed out by their governments: Bear Stearns, Merrill Lynch, Citigroup, J. P. Morgan, RBS, Northern Rock. Iceland's banks melted down. The Federal Reserve cut rates to zero. What became known as the Global Financial Crisis still roils today, second only to the Great Depression in the modern history of finance. The past six years have been interesting times for a global macro hedge fund. Interesting times, too, to learn the tools of this trade.

Through our devotion to the scientific method, the rigour of our implementation, and (let's be honest) some luck, we survived. In fact we thrived. Our assets have grown from \$30 million at launch to \$4.5 billion today. We are a recognised specialist in our space and one of the top 50 hedge funds in Europe. Each month, the infrastructure I helped to build executes hundreds of thousands of trades with brokers and exchanges around the world, totalling many billions of dollars.

In November we closed our flagship fund to new investment. But there is much still to do. No laurels, no rest. Maintaining our performance requires continuous revolution, designing new models, finding better ways to control risk, developing new products. As we look ahead to 2013, numerous interesting challenges await. Life in an established hedge fund like Cantab may be less risky, but it is no less exciting.

For details of all Cantab's current vacancies, please visit: www.cantabcapital.com/yourfuture. Please send your CV and covering letter to careers@cantabcapital.com, quoting the reference CCP/CRN.



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24 April 2013
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The Computer Laboratory Celebrating 75 years



Tony Hoare
14:30 Wheeler lecture

Principal researcher at Microsoft Research Cambridge. Emeritus Professor of Computer Science at Oxford University. Honorary member of the Laboratory.



Mike Lynch
16:30 Innovation lecture
& discussion panel

Founder of Invoke Capital, UK-based technology investment company. Former CEO of Autonomy. Fellow of the Royal Academy of Engineering.



Alec Broers
19:30 Graduate
Association Dinner

Chairman of the board of directors of the Diamond Light Source. Emeritus Vice Chancellor of Cambridge University. Former Chairman of the House of Lords Science and Technology Select Committee.

