

The Ring

THE JOURNAL OF THE CAMBRIDGE COMPUTER LAB RING

Issue LII— September 2019

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Joe Bateson (BA14) is a software engineer at Yelp in San Francisco.

Stanislas Beneteau (MA99) is working at BNP Paribas Securities Services where he is Regional Head of Financial Intermediaries & Corporate Client Line.

Sébastien Bratières (PhD17) is a member of the advisory board at the Italian Association for Machine Learning in Rome.

Paulo Ferreira de Castro (RA07) is working as a software engineer at balena.

Nick Chambers (BA13) is working for Citadel LLC as a software engineer.

Dolly Chen (BA12) is CTO at Aurora Intel.

Matthew Dingley (BA10) works for Bull-dozAIR in Paris.

Graham Edgecome (BA14) has been promoted to Development Manager at Netcraft.

Nicholas Edwards (BA03, MBA11) is a manager at Eddie Bauer in Washington, USA.

Jay Foad (BA97) has joined AMD as a LLVM compiler engineer.

Steven Guest (MA00, Dip01) has been promoted to Head of Logistics Engineering at PROWLER.io.

Robin Harrison (MA03) is CTO at Smar-kets in London.

Andy Harter (PhD90) has been appointed a Deputy Lieutenant of Cambridgeshire.

Roger Hill (BA85) has joined Wealth Dynamix as a CRM developer.

Theodore Hong (RA11) is a software engineer at Apple in the San Francisco Bay Area.

David Yu–Tung Hui (BA18) is a visiting researcher at Mila in Montreal. He is a research assistant to Yoshua Bengio and is working on BabyAI.

Sichu Jiang (MEng15) is a software engineer at Google.

Aled John (MBA15) works at Condé Nast International where he is Head of Business Development.

Jakub Kaplan (BA11) is a senior product manager at Amazon in Seattle.

John Knox (BA13) is a software engineer at Facebook in London

Fabian Krause (MPhil14) is Head of Quant Technology at Man GLG.

Angus Lepper (BA12) is working as a software engineer at Google in Switzerland.

Miriam Leeser (PhD88) is currently a visiting professor at Maynooth University in Boston, Massachusetts.

Gerard Martin (BA10) is a software engineer at Icomera.

Sean Mullaney (MA00) is Engineering VP of Information at Zalando and the head of

Zalando's Fashion Insights Centre in Dublin. He leads a team of over 200 engineers and data scientists.

Elliott Pace (BA12) is an Associate Portfolio Manager at Elliott Management Corporation.

Karina Palyutina (BA13) is a researcher at Nokia Bell Labs in the Security Group.

David Piggott (BA11) has been promoted to Associate Director at Disney Streaming Services where he is technical team lead.

Tomas Pfister (BA10) has been promoted to Head of Research at Google Cloud AI. Tomas came to Google from Apple where he co-founded Apple's central research group for AI.

Harry Ragan (BA13) is a software engineer at Google in London.

Ben Shaw (BA13) is a software engineer at Stripe in San Francisco.

Ilinca Sorescu (BA15) has recently completed a master's degree at the Technical University in Munich. She is currently working at luminovo.ai in Germany as a deep learning engineer.

Mark Spiteri (PhD00) has recently joined Experian where he is Senior Vice President, Software Development.

Niko Stahl (MPhil14) has received his MBA from Harvard Business School

Frank Stajano, Professor of Security and Privacy at the Department of Computer

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The Ring is the journal of the Computer Lab Ring, which is the graduate association of the Department of Computer Science and Technology, University of Cambridge.

Science and Technology, University of Cambridge, has been awarded his 4th dan in Kendo.



Frank Stajano (L) with his master Toyomura sensei (Hanshi, 8th dan)

Frank started kendo when he lived in Japan. He practiced daily for a year, reaching the rank of 1st dan. He then continued to practice in Cambridge, going back to Japan for his gradings, and in a few more years he reached 2nd and 3rd dan and became the leader of the University's dojo, Tsurugi Bashi. In that capacity he has introduced many hundreds of people (mostly but not exclusively students) to kendo and has established an exchange programme with Japan that has brought many dozens of Cambridge students to Tokyo and vice versa. He also serves as a Level 3 Regional Coach for the British Kendo Association. He passed the 4th dan exam on 11 August 2019 at the end of a 4-day international kendo seminar held at the University of Surrey, after 15 years of hard training as 3rd dan.

Philip Tromans (MPhil10) is CTO at Kvasir Technologies.

Pengyu Wang (MPhil11) has received his PhD from the University of Oxford.

Paul Ward (Q MA94) has been promoted to Head of Data Strategy at RBS in London.

Chris Waring (MA05) has been appointed Executive Director at Revolut.

Olivia Wiles (BA15, MPhil16) is doing a PhD at the University of Oxford.

Colin Whitby-Strevens (PhD70) has retired from Apple Inc, where he worked as an Interface Architect. He and his wife now live in Saratoga, California.

Meredydd Williams (MPhil14) received his doctorate from the University of Oxford in 2018. He is currently a cyber-security and technology consultant at Roke Manor Research.

Clemens Winter (BA13) is working at OpenAI in San Francisco.

Feng Zhou (MPhil04) is Head of Digital at ShineWing in Beijing.

Job listing

August 2019

UtterBerry

- *Hardware and software engineers*

Aspirant Analytics

- *Fullstack developer*

July

lowRISC

- *Hardware design engineer*
- *Hardware test and verification engineer*
- *Firmware engineer*
- *Software engineer (EDA tools)*
- *Tooling and automation engineer*

Yelp

- *SREs and infrastructure engineers*

Sartorius Stedim

- *Software engineers*
- *Fullstack engineer*

Seamless ML

- *Software engineer*
- *Data scientist*

Flourish

- *Support specialist*

June

SoftwareAG

- *Software engineers*

Q-bot

- *C++ Software engineer (Robotics)*

If you have a job advert that you would like included in the weekly listing, please send the details (as a word doc) to cam-ring@cst.cam.ac.uk

Hall of fame news

DroneDeploy

DroneDeploy has announced the roll out of two major philanthropic efforts: the organization's commitment to the Pledge 1% Initiative and the launch of DroneDeploy.org, the philanthropic arm of the company focused on employing the use of 'Drones for Good.'

The Pledge 1% movement seeks to change the world by inspiring companies of all sizes and stages to donate 1% of employees' time, 1% of profits, 1% of equity, and/or 1% of products to nonprofits.

DroneDeploy will join Pledge 1% in two ways. First, DroneDeploy will continue partnering with nonprofit organizations engaging in work that meets the mission of 'Drones for Good' by providing its drone software free of charge. Second, DroneDeploy team members will be volunteering at charities such as the Ronald McDonald House and the Bay-Area's own Room to Read and Project Open Hand.

DroneDeploy.org is the evolution of the Flyanthropy program, which was designed to equip organizations on a mission to improve the health of the world's people, habitats, and history with software and intelligence to support data-driven decisions. The Flyanthropy program has contributed to multiple success stories, including supporting relief efforts during last year's 'Camp Fire' in California and devastating earthquake in Sulawesi, Indonesia.

Factmata

Factmata has been backed by eyeo GmbH, the company behind Adblock Plus.

As part of the investment, Factmata will take over further development of eyeo's Trusted News browser extension. It will alert users to hate speech, racism, sexism, bias, sensa-

tionalism, one-sidedness or deceptiveness in news articles, using Factmata's proprietary language-analysis algorithms.

Factmata was one of the first global companies to tackle fake news online. It raised funding from major internet pioneers such as Mark Cuban, Craig Newmark, Sunil Paul and Biz Stone. Since then, Factmata has developed AI software which can accurately score content for aspects like political bias, hate speech, racism, sexism, toxicity, obscenity, threats, insults, and clickbait.

Green Custard

Green Custard scooped both Business of the Year (under 50 employees) and Overall Winner at the SME Cambridgeshire Business Awards 2019.

The Business of the Year award is for those showing outstanding initiative, boldness and imagination in the enterprise, as well as sound management practices. Finalists needed to demonstrate sustainable growth combined with a degree of commercial success that is exceptional for the size of the business.

Green Custard now goes forward to the SME National Business Awards 2019 which are being held at Wembley in December 2019.

Masabi

Masabi has announced a \$20 million growth funding round with investment led by Smedvig Capital with MMC Ventures and other existing investors. The capital will accelerate Masabi's global expansion of its award-winning mobility platform, Justride, and fast-track the company's role in bringing digital transformation to transit agencies and operators of all sizes, enabling the foundations for integrated multi-modal journeys.

On target to exceed \$1bn in annual transit ticketing sales over the coming year, Masabi will continue building on its recent additions to Justride, which removes the need for passengers to buy a ticket. Instead, they simply tap a contactless bank card, mobile phone or smartcard to travel. These innovations, together with integrations with transport leaders including Uber, Transit, Jorudan and Keolis, are making it easier for people to discover and access public transit services in an efficient and scalable way.

Masabi's Justride platform is currently in operation with more than 50 transport agencies in ten countries, including for Boston MBTA, National Express, New York MTA, HTM The Hague, TAO Orleans, Denver RTD, LA Metrolink, Lurraldebus in Spain, My Fast Ferry in Sydney and Las Vegas RTC.

Operis

Operis won the Silver Award at the Partnerships Awards 2019 for the category of Financial Advisor of the Year. This follows the Gold Award in the same category in 2018.

Raspberry Pi

Raspberry Pi 4 is now on sale, with prices starting at \$35.

Raspberry Pi co-founder and CEO Eben Upton says that it provides a 'PC-like level of performance for most users, while retaining capabilities and hackability of the classic Raspberry Pi line.'

Volunteering

David Mushin has over 35 years of experience leading international software businesses. Now, as a volunteer tutor for Action Tutoring, he helps pupils increase their subject knowledge, confidence and study skills.

Susannah Hardyman (pictured) graduated from St Johns College, Cambridge in 2007. She founded the charity Action Tutoring in 2011 to make the benefits of tutoring available to children who cannot afford it, and help close the gap in educational achievement of poorer children.



The education world has been rocked by changes over recent years: extensive curriculum updates, a reformed GCSE and SATs grading system and school funding has been tighter than ever. It's not surprising that tutoring remains popular. The Sutton Trust's annual poll on private tutoring confirmed that 41% of

pupils in London have had a tutor, and nationally the figure is 27%.

There's a problem in all this. Private tutoring is expensive and many parents cannot pay for it. This worsens the substantial attainment gap that exists in education in this country between disadvantaged pupils and their peers. The recent Education Policy Institute (EPI) Education in England report highlighted that this gap has stopped closing. At primary level, disadvantaged pupils on average leave school 9.2 months behind their peers. At secondary level pupils are 18.1 months behind their peers by the time they finish in formal education

Action Tutoring knows how impactful tutoring can be, and delivers help through volunteer tutors.

In 2018 Action Tutoring supported nearly 2500 pupils through 1,100 volunteer tutors across 80 schools in 7 cities in England.

Tutoring is delivered differently to private tutoring: working in partnership and in school, with schools, the tutors are all volunteers and individual trained staff members are responsible for each group of volunteer tutors, pupils and teachers, who make sure everything runs smoothly.

If you, or any organisations you are connected with, are interested in supporting as volunteers Action Tutoring would love to hear from you. Please get in touch.

Action Tutoring is growing and looking for more volunteers — in London and Birmingham, Bristol, Liverpool, Newcastle, Nottingham, Sheffield and Sussex

What difference does it make?

Last year disadvantaged secondary school pupils tutored by Action Tutoring matched the national GCSE pass rate, after the equivalent of just two terms of weekly tutoring. This, despite the pass rate for disadvantaged pupils tending to fall 20% behind the overall national figures, in English Language and Maths GCSEs. 72% of primary pupils supported by Action Tutoring achieved national standards in their SATs, where just 10% were working at this level at the start of their programme.

Nationally 71% of pupils leave school achieving a grade 4 in their English and Maths GCSEs

But only 44% of those pupils receiving Free School Meals (the government's way of measuring poverty in schools) achieve this benchmark.

While there are many factors that contribute to this, the bottom line is that it is unjust and Action Tutoring are working to change this.

- Volunteers skills:
- Good communication skills
- Fluent English speaker

- Confidence
- Enthusiasm for working with young people
- You do not need a Maths or English degree!

More information can be found at: <https://actiontutoring.org.uk/>

If you are interested in helping please get in touch by emailing hello@actiontutoring.org or phone 0203 872 5894

David Mushin graduated from St John's College in 1979. He has worked for over 35 years as CEO, Chairman, and Director, leading a number of international software businesses focused on solutions for tough engineering design, operation and supply chain problems. Recently he chose to find ways to help children aspire to STEM careers, and has even considered re-qualifying as a secondary school teacher. David stumbled across Action Tutoring and has spent the last year as a volunteer Maths Tutor in secondary schools in London. Now he is trying to help Action Tutoring find the volunteers needed for growth by spreading the word of the amazing work being done.

Research Spotlight

Jonathan Goddard reports from the Symposium on AI for Social Good which took place at the Department of Computer Science and Technology in May 2019. One of the speakers, the department's Professor Alan Blackwell, spoke of his vision to build AI that works for sub-Saharan Africa.

Professor Alan Blackwell started by addressing a number of questions on artificial intelligence fit for the African context.

How is AI defined in another country? Should we expect other countries to adopt a different definition?

Blackwell noted that it is helpful to consider how much definitions of AI have already changed in the past. The definition of AI was very different 30 years ago, when key applications of expert systems were in industrial fields such as data fusion, diagnostics and predictive maintenance.

What is 'AI for social good'? How can we define 'AI for social good' in 2019?

Here Blackwell stated that perspective is key. There are multiple ways to view AI, such as whether you're from a rich or poor country, or whether you think primarily in terms of technology or public policy.

For people focused on public policy in the UK, AI seems all-encompassing?

- Androids (i.e. movie robots)
- Self-driving cars
- Turing test (i.e. chatbots)
- Any kind of algorithms
- Machine vision and deep learning
- Data science
- Search engines and social media
- Drones
- Personal profiling

Blackwell suggested that AI for good has become an arbitrary term. Definitions of what is 'good' are subject to change. He noted that, in the past, many people thought slavery was acceptable, as was a lack of gender equality. He asked whether our definitions of what is 'good' would change in the future?

Blackwell also asked whether we should be worried about artificial intelligence? He noted that we have already seen instances where things have gone radically wrong. For example take the Boeing 737 max tragedies.

Working towards internationally-agreed goals for social good

Professor Blackwell questioned whether we can reach an international consensus about what is 'good'? He noted that the closest thing we have to this is the United Nation's Sustainable Development Goals. [The 17 goals are 'the blueprint to achieve a better and more sustainable future for all'.] However when we ask which of these goals count as 'social good' he stated that the answer differs according to perspective. For rich countries think climate change, biodiversity, energy. For poor countries the focus is on clean water, maternal health, education, and economic growth

Broad learning rather than deep learning

In his talk Blackwell promoted a manifesto for broad learning rather than deep learning. He emphasised the need to talk to a broad range of people about their needs, and the importance of engaging with all members of society not just the elite; it's not sufficient to talk only to philosophers, lawyers and politicians about what they expect from AI.

In 'inventing' AI in Africa, he stressed the need to build on broadly established pragmatic engineering methods and noted that it is imperative to give people broad tools, not fragile solutions. We must not assume that definitions of what constitutes 'social good' in an African context are the same as those that emanate from corporate labs or rich universities.

Building African AI

Alan Blackwell reiterated that he takes his lead from African academics, students and entrepreneurs. He works with African organisations including Data Science Africa, UN Global Pulse Lab, the African Institute for Mathematical Sciences, Deep Learning Indaba and Africa's Voices Foundation. He noted that his work in Africa will be informed by cultural and postcolonial studies, and that while he will collaborate with local academics he will be cognisant of the fact that they too are often also members of the elite class within their own country, and so face their own challenges connecting with other groups in society.

In creating AI, Blackwell emphasised that it is important to know the origin of resources (for example minerals from conflict zones), and that business models must work for the African context (the supply chain model generated for an Amazon Alexa shows how building AI uses a global consumption of resources).

Blackwell stated that he plans to spend eight months in sub-Saharan Africa, living and working in Namibia, Ethiopia, Uganda and Kenya. He noted that part of the challenge will be finding suitable teaching materials and current toolkits for machine learning, as current resources such as MOOCs have been shown to disadvantage low-income students. He stated that AI in Africa will need to respond to different landscapes for investment and regulation; it is not as easy to get funding for AI projects in Africa as it is in Cambridge.

For developing countries he noted that it is vital to consider the sustainability of investment, and consider how long the AI boom will continue. Richer, Western nations and organisations are better equipped to change tack to another field if the desire to invest in AI suddenly declines. Research infrastructure in developing countries can't be as flexible.

Alan Blackwell is Professor of Interdisciplinary Design at the Department of Computer Science and Technology. He will spend the upcoming academic year on sabbatical developing AI in sub-Saharan Africa, along with local academics and international organisations.

Alan's work on building AI in sub-Saharan Africa is part of The Cambridge Global Challenges (CGC) Strategic Research Initiative (SRI). Alan Blackwell is a research lead for the SRI.

Computer Laboratory news

Appointments

Srinivasan Keshav has been appointed to the Robert Sansom Professorship of Computer Science. Professor Keshav joins from the Cheriton School of Computer Science at the University of Waterloo.

Dr Cengiz Öztireli has been appointed University Senior Lecturer. Dr Öztireli joins from ETH Zurich where he was a research scientist at Disney Research Studios.

Awards

Professor Simone Teufel has been awarded a 2019 Pilkington Prize. Pilkington Prizes are awarded to individuals who make a substantial contribution to the teaching programme of a Department, Faculty or the University as a whole.



Professor Simone Teufel

Professor Teufel was the main author of the Computer Science Part 1A Machine Learning for Real World Data course which ran for the first time in 2017. She created the syllabus, designed the practicals, oversaw the creation of the software and developed most of the lecturing material. This course combines teaching the fundamentals of machine learning with reinforcing students' understanding of programming and algorithms, and is taught from an experimental / methodological perspective to complement the more 'standard' theoretical machine learning courses.

PhD student **Krittika D'Silva** has been named one of 10 women listed in the 2019 N²Women: Rising Stars in Computer Networking and Communications, as well as Rising Star of VentureBeat's first Women in AI Awards. Krittika works on spatio-temporal urban mobility modelling using social media and transport data, under the supervision of Professor Cecilia Mascolo.

Outreach

On July 1st 2019, the department welcomed 150 teachers and students from Year 10 to Year 13 for a day of talks and workshops to give prospective degree students a taste of university studies, and to illustrate some of the many career paths for computer scientists.

The event was the first in a new series of events to inspire and support A level computer science students, and marked the official launch of a new online learning platform called Isaac Computer Science. The platform is being developed by the Raspberry Pi Foundation and the University of Cambridge as part of a major Department for Education investment in computer science education across all key stages.

For more information about Isaac Computer Science go to: <https://isaacomputer-science.org/>

Student prizes 2019

G-Research Prize for The Best Part IA Student awarded to **Douglas Boyle** (CHU)

G-Research Prize for The Best Part IB Student awarded to **Dusan Zivanovic** (T)

University Winifred Georgina Holgate-Pollard Memorial Prize for the Best Part II Student awarded to **Diptarko Roy** (CHU)

Ensoft Prize for The Most Improved Part II Student awarded to **Max Bull** (HH)

G-Research Prize for the Best Individual Project in the Computer Science Tripos awarded to **Craig Ferguson** (CHU)

The following students were awarded Palantir prizes for highly commended Part II project dissertations:

Roxana Dumitriu (CTH), **Niall Egan** (EM), **Rowan Hall Maudslay** (HO), **Harry Jones** (T), **Phoebe Nichols** (CHU), **Cameron Ramsay** (CAI), **Diptarko Roy** (CHU), **Lex van der Stoep** (Q)

Entrepreneur First Prize for the Best Part III Student awarded to **Matthew Le Maitre** (CHR)

Google Prize for the Best Part III Research Project awarded to **Andreea-Ioana Deac** (Murray Edwards)

Dr John Maheswaran Prize for Highly Commended Part III Project awarded to **Shyam Tailor** (DOW)

Examiners' Prize for Highly Commended Part III Project awarded to **Ran Zmigrod** (F)

Winton Capital Prize for the Best MPhil Student awarded to **Cristian Bodnar** (F)

Google Prize for the Best MPhil Project awarded to **Enxhell Luzhnica** (W)

Palantir Prize for Highly Commended MPhil Project awarded to **Mihai Barbu** (JN)