

University of Cambridge
**Department of Computer Science
and Technology**

ANNUAL REPORT

2023-24

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Introduction

The Department continues to deliver world-class research, combining theory with practical activities, and significantly advancing both the field and computing in the wider world. The Department sustains active research across the breadth of computer science, and we encourage the development of new technologies and applications. Key elements of the Department’s ethos are our focus on impact as well as our openness to working closely with both academic and non-academic organisations.

The past academic year was Professor Alastair Beresford’s first year as Head of Department. One of his main areas of focus has been to consult Faculty on the future size and shape of the Department. The [mission](#) of the University, and therefore of the Department, is “to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence”. On the one hand, a larger department means more output and therefore stronger delivery against our mission. On the other hand, there are several constraints on growth including a desire to maintain a strong sense of academic community, to operate within our financial constraints and ensure we continue to provide high-quality physical space for our activities. The number of faculty, researchers, professional services staff and students needs to be in balance and provided with adequate resources.

After discussions in and around the Department Away Day in July 2024 the near unanimous view is that some growth, perhaps of the order of two positions per year over a five-year period, is both desirable and sustainable from a community perspective, however challenges remain in terms of finance and space. Professor Beresford will cover further details on this topic in his presentation at the Annual Meeting.

In September 2024 we advertised two new Faculty positions: one in Human Computer Interaction the other in Wearable Computing. Appointments will be made during 2024/25. We also enjoyed another successful year of academic promotions, with three staff promoted to full Professorships and three more to Professor (G11).

Staff Overview

As of 30 September 2024, the Department of Computer Science and Technology consisted of 224 members of staff:

Academic staff	52
Professional services staff	54
Research fellows and research staff	118

Professor Ross Anderson FRS FRSE FREng

It was with great shock and sadness that we heard of the death of Ross Anderson, our friend and longtime colleague, who died unexpectedly at home on Thursday 28th March 2024. Ross made significant contributions across many areas of computer security and beyond, including cryptology; cryptographic protocols; cybercrime; hardware security and tamper resistance; information hiding

and steganography; peer-to-peer networking; the security of application programming interfaces; the usability of computer security methods; the economics of information security; the connection between security and human behaviour; and many more. He was one of the founders of the field of security economics which explored how ideas from economics can be used to improve our understanding of computer security as well as better inform public policy.

Professor John Daugman FRS FRSE FEng

We were very saddened by the death of our former colleague, John Daugman OBE FEng FBCS who died in June 2024. John was a pioneering computer scientist in the fields of computer vision, neural computing, and pattern recognition whose work changed lives by giving people the means to prove their identity. John's iris recognition algorithm helped change the lives of millions of people.

New Associate Professors:

Dr Rika Antonova joined the Department in September 2024.

Dr Martin Kleppmann joined the Department in January 2024.

Dr Prakash Murali joined the Department in January 2024.

Promotions

The following members of staff were successful in the 2023-24 Academic Career Pathway exercise. Their promotions took effect on 1 October 2024.

Professorships (G12)

Professor Nic Lane

Professor Thomas Sauerwald

Professor Jamie Vicary

Professorships (G11)

Professor Carl Henrik Ek

Professor Tom Gur

Professor Ferenc Huszar

Senior Research Associates

Dr Yang Liu

Retirements

Professor Lawrence Paulson retired on 30 September 2024. Although he has officially retired, Larry will remain a member of the Department as an Emeritus Professor, and we look forward to continued collaboration.

College Fellowships

The Department continues to strengthen its links with the Colleges. The following University Teaching Officers hold College Fellowships:

Professor Alastair Beresford, Q
Professor Alan Blackwell, DAR
Professor Paula Buttery, CAI
Professor Ann Copestake, W
Professor Jon Crowcroft, W
Professor Anuj Dawar, R
Dr Carl Henrik Ek, PEM
Professor Marcelo Fiore, CHR
Dr David Greaves, CC
Professor Hatice Gunes, TH
Professor Robert Harle, DOW
Dr Sean Holden, T
Professor Alice Hutchings, K
Professor Timothy Jones, CAI
Professor Srinivasan Keshav, F
Professor Neel Krishnaswami, T
Dr Markus Kuhn, W
Professor Nic Lane, JN
Professor Neil Lawrence, Q
Professor Pietro Lio, CLH

Professor Anil Madhavapeddy, PEM
Professor Cecilia Mascolo, JE
Professor Simon Moore, TH
Professor Richard Mortier, CHR
Dr Fermin Moscoso del Prado Martin, JE
Professor Robert Mullins, JN
Professor Lawrence Paulson, CL
Professor Amanda Prorok, PEM
Professor Andrew Rice, Q
Professor Thomas Sauerwald, EM
Professor Peter Sewell, W
Professor Emily Shuckburgh, DAR
Professor Frank Stajano, T
Dr Jonathan Sterling, CL *
Professor Jamie Vicary, K
Professor Andreas Vlachos, F
Dr Ian Wassell, CHU
Dr Damon Wischik, CHR
Dr Jeremy Yallop, R

* Fellowship taken up during 2023/24

Honours, Awards, Achievements and Appointments

We are pleased to report a selection of highlights from the many staff and student honours, awards, achievements and appointments during 2023-24.

Royal Academy of Engineering Chair in Emerging Technologies

[Nic Lane](#) was awarded a [Chair in Emerging Technologies](#) by the Royal Academy of Engineering (RAEng) for work to make the development of AI more democratic by focusing on AI methods that are less centralised and more collaborative, and offer better privacy protection. He is using this prestigious award (worth £2.5 million over 10 years) on a project called DANTE. This aims to encourage wider and more active participation across society in the development and adoption of even the most advanced AI techniques. See <https://www.cst.cam.ac.uk/news/making-development-ai-more-democratic>.

Best Paper Awards

PhD student Jessica Man won the Best Student Paper Award at eCrime – the Symposium on Electronic Crime Research, organised by APWG, a not-for-profit industry association focused on the growing problem of phishing, crimeware and e-mail spoofing. The paper is titled 'Autism disclosures and cybercrime discourse on a large underground forum'. Jessica's path towards the PhD

programme is unusual and her wonderful story is recorded in a news article we published this year: <https://www.cst.cam.ac.uk/long-hard-journey>.

At the EMNLP 2023 Conference (Empirical Methods in Natural Language Processing), Andreas Vlachos & PhD student [Julius Cheng](#) won the Best Paper award for '[Faster Minimum Bayes Risk Decoding with Confidence-based Pruning](#)'.

At ACL 2024, Andreas Vlachos and PhD student Pietro Lesci together with their collaborators from ETH were given the Best Paper Award was given to for 'Causal Estimation of Memorisation Profiles'. See <https://x.com/aclmeeting/status/1823664612207743110?lang=en>.

Amanda Prorok gave a TEDx talk in Oxford in January this year: <https://proroklab.org/wp/2024/05/08/future-proofing-robotics-crafting-environments-for-tomorrows-machines-tedxoxford-talk-by-amanda-prorok/>

A new research group named "The Quantum Computing Group" <https://www.cst.cam.ac.uk/research/quantum> has been formed in the Department. The group studies a wide array of topics in Quantum Computation and Quantum Information, ranging from foundational research in Quantum Algorithms, Complexity Theory, Combinatorics, and Dynamics -- all the way to applied areas such as Quantum Architecture, Resource Estimation, and Compilation.

Student awards

Part II student Jakub Bachurski was named the Undergraduate Grand Finals Winner in the ACM Student Research Competition 2024. The Grand Finals are the culmination of a year-long competition that involved more than 323 computer science students presenting research projects at 21 major ACM conferences. Jakub took first place in the undergraduate category for his Bachelor's dissertation research (supervised by Emeritus Professor Alan Mycroft) into ways of solving problems in deep learning engineering by using the techniques of compilers and programming languages. His project was entitled 'Escaping the Pointless: Embedding Pointful Array Programming in Python'. See <https://www.cst.cam.ac.uk/news/escaping-pointless-research-wins-undergraduate-top-prize>.

PhD student Chaitanya Joshi was one of just five students across Europe to win a Qualcomm Innovation Fellowship Europe. These Fellowships are awarded annually through a programme that recognises, rewards and mentors innovative PhD students. In Europe, the Fellowships are awarded to excellent young researchers in the fields of artificial intelligence and cybersecurity who each receive individual prizes of \$40,000 for a project they have proposed and mentorship by the Qualcomm Technologies research team. See <https://www.cst.cam.ac.uk/news/phd-student-awarded-qualcomm-innovation-fellowship>.

Research Staff awards

Senior Research Associate Yang Liu was named one of 2024's N2Women Rising Stars in Networking and Communications. See <https://n2women.comsoc.org/awards/>.

The Wiseman Prize

The Wiseman Prize recognizes students and research staff who make exceptional contributions to the work of the Department which is beyond their expected duties. Their outstanding contributions

make a real difference to the Department. The following individuals were awarded the prize for their contributions during 2023-24:

Jenny Blessing	Ceren Kocaogullar	Yann Papadodimitraki
Jiaee Cheong	Guy Laban	Luis Adan Saavedra del Toro
Charlotte Cox	Lucie Charlotte Magister	Sam Shakeshaft
Marton Erdo	Tina Marjanov	James Sharkey
Bea Healy	Urška Matjašec	Anna Talas
Chaitanya Joshi	Karl Mose	Jonathan Woodruff
Aneesah Khan	Jino Osmani	Yu (Yvonne) Wu

Research

The Department continues to produce world-leading research, and this is at the heart of the Department's activities (<https://www.cst.cam.ac.uk/research>). Research grant income for the financial year 2023-24 was £13,155,569.

A selection of research highlights between October 2023 and September 2024 include:

- Carl Henrik Ek, Boeing, Machine Learning Approaches for Aerospace Engineering Design Assistant: ARES
- Tom Gur, MRC, Foundations of Classical and Quantum Verifiable Computing: Focal
- Mateja Jamnik, EPSRC, IAA Distilling Knowledge Through Representation: A Collaborative Approach for Enhanced Video Scenario Analysis
- Mateja Jamnik, Department of Defense Congressionally Directed Medical Research Programs (DDCDMRP), Multi-Modal Data Integration Across Breast Cancer Molecular Sub-Types, Exploring Development of: A. Predictors of Treatment Response, Early Relapse and Survival; B. Identification of Drivers of Early Micro-Metastatic Potential
- Nicholas Lane, Royal Academy of Engineering, Democratic AI Technology: Open Collaborative, Decentralised (RA Eng Chair in Emerging Technologies)
- Nic Lane, Interuniversitair Micro-Electronica Centrum VZW (IME), Hardware-Aware Network Architecture Search Under ML Training Workloads: Hardware
- Pietro Lio, EPSRC Impact Acceleration Account, Improving IVF and Fertility Outcomes Using Existing AI Techniques
- Pietro Lio, Horizon Europe, Well-Being Improvement Through the Integration of Healthcare and Research Data and Models With Out Border for Chronic Immune-Mediated Diseases: Wisdom
- Robert Mullins, EPSRC, Perfect Recollection for Clearer Insight
- Amanda Prorok, Royal Commission for the Exhibition of 1851, Explainable Cooperation in Heterogeneous Teams
- Andreas Vlachos, Alan Turing Institute, Fever IT: Fact Extraction and Verification with Images and Text
- Tom Gur, European Research Council (ERC) Starting Grant for a research project on new quantum algorithms
- Anil Madhavapeddy and colleagues were awarded UKRI funding under a new cross-Research Council funding scheme for work to develop 'Terra', an AI tool for mapping the terrestrial life on our planet.

Activities, Events and Updates

Postgraduate Studies Open Day

The Postgraduate Education Office participated in the annual Postgraduate Studies Open Day in November 2023. As in previous years, the event was held online. In addition to sessions provided by the Postgraduate Admissions Office, the Department offered talks from the Director of Postgraduate Education, Professor Mateja Jamnik.

Climate & Sustainability Research Showcase

Our Climate and Sustainability Research Showcase in January 2024 featured a series of talks by early-career researchers from this Department and from the AI for the study of Environmental Risks (AI4ER) doctoral training centre, which we co-host. Speakers included Amelia Holcomb whose talk on 'Space Lasers for Good: Remote measurement of tropical forest degradation' described her work on combining spaceborne light detection and ranging (LiDAR) with other sensors to provide large-scale, high-resolution measurement of the carbon emissions associated with tropical forest degradation. Other speakers included Gates Scholar Anais Berkes, discussing how the post-pandemic increase in remote working has led to electric vehicles being more frequently plugged in at home, enabling their use as bi-directional energy storage units within photovoltaic-powered microgrids. Simon Mathis closed the event with a talk about 'AI designed biotechnology to tackle environmental challenges'. He highlighted several areas where biomolecules can make a tangible difference to environmental challenges and how AI can help design biomolecules that enable such feats. The audience were drawn from industry, the University and also included some of our alumni.

Supporters' Club

Companies enrolled in the Department's Supporters' Club pay a modest annual subscription in exchange for opportunities to interact with students, mostly for the purposes of recruitment. These organisations, which range from start-ups to multinational enterprises, give tech talks, engage in Part 1B projects, advertise opportunities such as graduate roles, internships and events to students, and take part in the Department's Annual Recruitment Fair. Membership has stayed stable over the last few years with a current level of over 90 members.

Subscription to the Supporters' Club is split into three parts: a basic membership, a fee for the Recruitment Fair, and a donation component for those able to contribute further. Despite donations above the membership fee being optional, several companies still choose to give extra on top for which we are extremely grateful. As of 2024 the annual membership fee has increased from £300 to £400. The income is used for a range of purposes including supporting students who are facing hardship, offering additional skills training to early-stage researchers, supporting our growing outreach programme and bridge-funding new research ideas.

Supporters' Club activities include in person tech talks and the annual Supporters' Club dinner. The dinner was held at Homerton College in March 2024 and was attended by around 30 companies. A

successful Recruitment Fair was held in the Department over two days in November 2023. Over 40 companies attended the event.

Cambridge Ring

The Ring is the Department's alumni association. Originally restricted to graduates of the Department, membership has been extended in the last few years to include current and former staff members and longer-term visitors as well as graduates of other departments who were significantly involved with Computer Science while at Cambridge or who work in computer science now.

In the past, only a small fraction of those eligible to join actually signed up as members. But in 2019 the Ring was brought under the management of the Department's Research Strategy Team, which put more membership management structure in place and undertook a significant recruitment and data-gathering effort in conjunction with the University's Development and Alumni Relations office. The team also increased the frequency of communication with alumni and set up a Ring Forum at the end of 2020, an online discussion venue for peer-to-peer discussions, which has over 1,200 members. There is also a [Cambridge Computer Lab Ring](#) LinkedIn group with well over 700 members. Ring membership has more than doubled in the last few years. It continues to rise and now has over 2,200 members. The team are putting efforts in to recruiting graduating students to join the Ring.

The annual Ring Dinner was held in April this year. The occasion was attended by around 40 alumni. The event took place in Queens' College and began with a tea and talks from members of the Department and the presentation of the Hall of Fame awards. This was followed by a drinks reception and a three-course dinner, with speeches from the Head of Department Professor Alastair Beresford and guest speaker Dr Gavin Ferris.

In person Ringlets (small gatherings of Ring members) have been taking place every other month in London this year. A Ringlet event took place in New York in June this year, as well as two taking place in the Bay Area, coinciding with visits from Professor Alastair Beresford in May, and Professor Neil Lawrence in September.

In December 2024 a winter quiz was held for alumni and postgraduate students in order to help increase interactions between them. This involved quiz questions and a treasure hunt for computer relics in the Department.

The 'Hall of Fame'

The annual Cambridge Ring 'Hall of Fame' awards are given in four categories:

- Company of the year
- Product of the year

- Publication of the year
- The Better Future Award (to recognise those who have made significant contributions to humanity through technology)

The 2023 awards were presented at the Ring dinner <https://www.cst.cam.ac.uk/news/celebrating-our-hall-fame-awards>

Company of the Year 2023: Arm

Company of the Year went to [Arm](#), a global company, with 43 offices in 21 countries and more than 6,000 employees worldwide, including nearly 3,000 in the UK with its global headquarters in Cambridge. Born here in 1990 with the goal of designing a computer intended to run on a battery. Its success since then in designing, architecting, developing and licensing high-performance, low-cost and energy-efficient CPUs — the 'brain' of all computers and many household and electronic devices — helped fuel the smartphone revolution and has made Arm a household name. Its worth was recognised in autumn 2023 when it was floated on the Nasdaq Global Select Market in an offering that valued it at \$54 billion.

Arm has long had a research relationship with the Department. Most notably, this has led to the development of a potentially game-changing new cybersecurity technology, focusing on new ways to design the architecture of a computer's central processing unit to make software less vulnerable to security breaches. The technology, CHERI, extends conventional architectures and software stacks with novel hardware support for memory protection and secure encapsulation. Since early 2022, an industrial demonstrator of the technology has been made available to UK companies for testing through the UK government's £200 million Digital Security by Design programme.

Product of the Year 2023: Superhuman

Product of the Year was awarded to super-fast email app Superhuman, founded by Rahul Vohra in 2014. Targeted at users who want to improve their productivity, it features liberal use of keyboard shortcuts to speed up email reading and replying. Superhuman has raised over \$100 million from venture capitalists. Initially, the app only integrated with Gmail, but in May 2022 it launched integration with Microsoft Outlook. In February this year, Superhuman announced AI-powered drafts for instant replies.

Better Future Award 2023: Robotic Mental Wellbeing Coaches

The Better Future Award went to researchers [Micol Spitale](#), [Minja Axelsson](#) and [Hatice Gunes](#) for '[Robotic Mental Wellbeing Coaches for the Workplace: An In-the-Wild Study on Form](#)'.

In Prof Gunes's [Affective Intelligence and Robotics \(AFAR\) Lab](#), researchers are exploring how social robots can be used to help support our mental wellbeing. In this study, they wanted to find out if robotic wellbeing coaches could be used in the real world to help employers protect and promote good mental health in the workplace. So in the first study of its type, they took two robots - one resembling a child, the other a more toy-like robot - to local tech firm Cambridge Consultants. There,

26 employees took part in weekly wellbeing sessions led by the robots. Although the robots had identical voices, facial expressions and scripts for the sessions, the researchers found that the physical appearance of the robot affected how participants interacted with it.

This study offered valuable insights for the design and deployment of robot wellbeing coaches. It also showed that robots can be a useful tool to promote mental wellbeing in the workplace and could help employers overcome resource barriers to promoting good mental health practices to their staff.

Publication of the Year 2023: [flap: A Deterministic Parser with Fused Lexing](#)

After a Department-wide selection process that saw almost 50 papers submitted and considered, Publication of the Year was awarded to [Jeremy Yallop](#), [Ningning Xie](#) and [Neel Krishnaswami](#) for their paper [flap: A Deterministic Parser with Fused Lexing](#).

Computer Architecture Research Centre

In June 2024 we launched our new Computer Architecture Research Centre – an initiative to build future capacity in this critical area of computing. The Centre will focus on research that addresses some of the grand challenges in computer architecture, design automation and semiconductors.

The idea arose from conversations with industry leaders about the importance of having a pipeline of talent in this area, as highlighted in the UK National Semiconductor Strategy. In this Department, we're proud of our research and innovation in this field, but we also recognise that to maintain the UK's leading position, we need to invest in developing the research leaders of tomorrow. That's why we're developing the new Centre to fund PhD students working in this area through donations from individuals and industry. The aim is to make the Centre a destination for collaboration between academia and companies, generating pre-competitive open-source artefacts and driving development of novel computer architectures.

The Centre Director is Professor Timothy Jones and Centre supervisors cover a broad range of topics including the design and optimisation of general-purpose microprocessors, specialised accelerators, on-chip interconnect and memory systems, along with verification, compilation and networking, quantum architecture and resource estimation.

At the June launch, Prof Alastair Beresford introduced attendees to the past, present and future of Computer Architecture in the Department, Professor Robert Mullins discussed Opportunity and Innovation in Computer Architecture, and Professor Simon Moore discussed the CHERI project and the co-design of hardware and software to fundamentally improve security. Current PhD students Marton Erdos, Bea Healy and Karl Mose gave lightning talks on their research, as did postdoctoral researcher Dr Minli Liao, before Tim Jones unveiled plans for the new Centre and invited the 100+ attendees to engage with us in developing it. We then broke for tea where our visitors greatly enjoyed browsing some of the 'relics' illustrating the history of computer architecture here in the

Department from our large collection of historical artefacts. The launch attracted a lot of interest, and we will be updating you on the Centre's next steps shortly.

Annual Alumni Event

We held a special event – 'Computer Vision: Seeing the Wood for the Trees' – as part of the University's annual Alumni Festival. In a series of short talks, speakers highlighted some of the research in AI, Environment and Education taking place here.

With fake news and misinformation on the rise, we need reliable ways to check the truth of what we are being told. So, alumni were keen to hear from Andreas Vlachos about the AI fact-checker he and his colleagues have developed that can automatically verify claims made to us online by politicians, by Chat GPT and in Wikipedia pages.

Researcher Patrick Ferris then talked about environmental research, discussing how UK authorities are increasingly making data about our local environments available online, but often in forms that don't help people see the larger patterns and insights. Patrick highlighted about new ways of visualising this data that can help us understand it better and draw conclusions from it.

And alumni had the chance to meet Alastair Beresford, Head of Department who introduced himself and talked about his work and research interests in improving the way that computer science is taught, both at school and university.

The Departmental Annual Garden Party

The Department held its Annual Garden Party on Friday, 6 September in the grounds of the Møller Institute in Cambridge. It was an opportunity for members of the Department to mix with colleagues and friends, while "Cores do Samba" played live Brazilian music.



Wheeler Lecture

Alumni and students packed Lecture Theatre 1 in mid-November 2023, when Simon Peyton-Jones delivered the 11th Wheeler Lecture, 'Beyond functional programming: a taste of Verse'. Simon is Engineering Fellow at Epic Games and Honorary Distinguished Fellow of this Department. In his lecture, he talked about Verse – a new programming language, being designed at Epic Games as the language of the metaverse.

"Verse is a functional logic language," he told the 250 attendees, "with a bunch of innovative ideas. Like Haskell, Verse is declarative (a variable in Verse stands for just one, immutable value) and higher order (lambdas are first class). But Verse goes well beyond Haskell, with existential variables, unification, expressions that yield multiple values, and much more besides." In his talk, he gave us a sense of what functional logic programming is about, what it looks like to program in Verse, and how it's possible to give meaning to Verse programs using rewrite rules.

The video of his talk is available here: <https://www.cst.cam.ac.uk/news/2023-wheeler-lecture-taste-verse>.

Teaching

Undergraduate Teaching

A total of 131 Part IA students were admitted in Michaelmas Term 2024. This is an increase of 6 students on 2023 and above the Department's numbers target of 120. The numbers break down into 67% home students, 7% EU students, and 26% international students. Percentages have followed a similar pattern to last year with a slight increase in home students. The percentage of female students is 19% which is a slight decrease from the figure of 20% for 2023.

The Part IA and IB 2024 Tripos examinations were held in person and closed book. The classing boundaries were set at the percentages shown below. Class distribution reflects the expected boundaries as set out in the Department's Marking and Classing document, allowing for examiner discretion.

Marking and Classing Expected Distribution		2022 Part II Results Final Distribution		2023 Part II Results Final Distribution		2024 Part II Results Final Distribution	
I	40%	I	42%	I	39%	I	40.2%
II.1	50%	II.1	48%	II.1	53%	II.1	50.0%
II.2	7.5%	II.2	8%	II.2	6%	II.2	7.1%
III	2.5%	III	2%	III	2%	III	2.7%

Postgraduate Teaching

The MPhil in Advanced Computer Science continues to run smoothly. Students provided positive feedback on the offered modules and One-Minute-Madness sessions and project presentations were popular live events in 2024. The Postgraduate Education Office is very grateful to the PhD students

who assisted in running practice sessions and who were session chairs for the presentations. Application numbers for the MPhil commencing October 2024 were 20% higher than 2023. We registered 63 MPhil students and a further 20 Part III students. We also expect between 47-51 PhD admissions in 2024-25. In the academic year to 30 September 2024, the Degree Committee approved 24 Ph.D. degrees and 59 M.Phil degrees, including 47 with Distinction.

Outreach

Cambridge Festival

Playing a negotiation game with a robot to see how many points you could win. Using your computational thinking skills to solve the puzzles that unlocked a pirate's treasure chest. Or making music with code. These were just some of the activities visitors were able to try at our Cambridge Festival Open Day on Saturday 16 March 2024.

We opened the doors of the Department for a day as part of the 2024 Cambridge Festival and invited the public in to find out more about computer science and technology. Children took turns to play negotiation games with Pepper the robot to try and win points (and prizes). Adults came to hear Carl Henrik Ek discuss where the dangers in AI really are and why we need to better understand the difference between human and machine intelligence. And throughout the day, many families headed to the Prorok Lab for demos showing what happens when a group of robots, working in formation, have to interact with a human.

Also popular was a return visit by former Department member Sam Aaron who ran a live demo and hands-on workshop on Sonic Pi, the free and beginner-friendly tool for creating music with computer code. We had a lot of fun and are already looking forward to next year's Cambridge Festival Day on 22 March 2025.

See <https://www.cst.cam.ac.uk/news/meeting-robots-solving-puzzles-making-music-code-our-cambridge-festival-day>.

Sutton Trust Summer School

Students on our Sutton Trust Summer School in August 2024 learned about algorithms, experimented with computer graphics and attended lectures on cybersecurity as they experienced what it's like to study Computer Science at university.

We run the Summer School every year with the Sutton Trust, a charity that works to ensure all young people can have access to life-changing educational opportunities. Participants on the Summer School are high-achieving A Level students at UK state schools.

During their week they attend lectures, practical classes and small-group teaching sessions and stay in a Cambridge college. This helps them gain insights into the Computer Science Tripos and experience what it's like to live away from home as an undergraduate. Students heard talks on areas from computer architecture to quantum computing. They also visited the University's Institute of

Astronomy nearby to hear how computer science is helping researchers advance our understanding of space.

See <https://www.cst.cam.ac.uk/news/experiencing-life-computer-science-student>.

University Open Days

We welcomed prospective undergraduate students at our Open Days on 4 and 5 July 2024. Year 12 pupils visited the Department for tours, to attend a sample lecture, hear a presentation about our Computer Science degree course and chat to Directors of Studies in Computer Science about what it is like to study here. Current undergraduates and postgraduates were on hand to answer questions and run activities offering ways to explore Computer Science. These activities included a Security demo, where researchers invited visitors to try their hand at 'lock-picking' and learn how techniques in picking locks have parallels with the techniques hackers use to break into our computers and access our data, and PhD student Karl Mose built a digital air hockey game on a Raspberry Pi computer that visitors could play.

See <https://www.cst.cam.ac.uk/news/welcoming-prospective-students-2024-open-days>.

Women in Computer Science

For the first time in 2024, we ran a five-month Women in Computer Science outreach programme. In line with the Department's aim of encouraging more women to study Computer Science, the programme gives female and non-binary students in Year 12 an insight into what studying Computer Science at university is like. It is one of the new outreach initiatives the Department has been able to introduce since recruiting Aga Niewiadomska as our first outreach administrator.

During the programme, participants joined discussion groups introducing them to topics from machine learning to cybersecurity. They also undertook a research project in an area of interest, mentored by a current undergraduate. All students who submitted a completed project were invited to an end-of-programme residential in Cambridge in late June.

During the residential, they toured the Department, visited colleges and had a workshop on computer programming language Prolog. They also watched a mock admissions interview, seeing some of the kinds of questions that are asked and some of the logical-thinking approaches interviewees might take when trying to answer.

The students also attended a panel discussion about applying to Cambridge and chatted to current Computer Science students about their experiences here before attending a formal dinner and staying overnight at Corpus Christi College.

The programme will run again in 2025. See: <https://www.cst.cam.ac.uk/outreach/women-in-cs-programme>.

STEM SMART

The Department took part in STEM SMART for the first time this year. This 17-month programme is open to students at UK state schools who satisfy at least one widening participation criteria. Starting in Year 12, this scheme aims to raise attainment and prepare students to submit applications to competitive universities. As part of the programme, students attended regular large teaching sessions led by Raspberry Pi, and those who engaged most progressed to smaller group supervision sessions led by current PhD students and post docs in the Department. The most engaged students also had the opportunity to attend a 4-day residential, which involved visiting the Department. During the visit, students heard a taster lecture, had a session on admissions and took part in an introduction to graphics practical session.

For more detail see <https://www.undergraduate.study.cam.ac.uk/stem-smart>.

Google DeepMind ‘Research Ready’ Internships

“Honestly, this has been a great opportunity and being able to spend a summer at Cambridge University working as a Google DeepMind intern gives me hope. Now I’ve done this, I should be able to think about going on to great places in the future.” So said Michael, one of 10 students who spent July and August 2024 here as ‘Research Ready’ interns.

He was taking part in this new programme that offers insights into AI research to students from under-represented backgrounds. During a paid eight-week research placement in July and August 2024, Michael and his fellow interns got the chance to experience life as a graduate student and gain insight into cutting-edge AI research.

This scheme ran for the first time in summer 2024. The internships were open to those who studied/are studying at a UK or Republic of Ireland university for their undergraduate degree. The programme was supported via the Google DeepMind Research Ready funding stream with the aim of helping to build a stronger, more diverse and inclusive global AI community.

The interns clearly relished the opportunity. “This scheme has let us come into a research environment where we can talk to leaders in their fields, where we’re helped to do ‘proper’ research – and where we’re encouraged to work much more independently than we ever would as undergraduates. It’s been an amazing experience,” says Andrew, who recently graduated with a BSc in Computer Science from Liverpool John Moores University. See <https://www.cst.cam.ac.uk/outreach/deepmind-research-ready>.

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