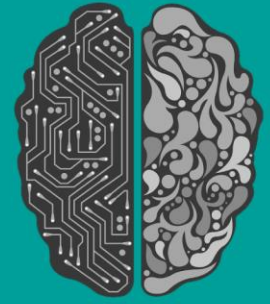


ARTIFICIAL INTELLIGENCE

UNDERLYING TECHNOLOGIES – HOW
THEY WORK AND HOW THEY ARE
APPLIED

03.10.17

Computer Laboratory, University of
Cambridge
William Gates Building, 15 JJ
Thomson Ave, Cambridge CB3 0FD



Sponsors and Supporters



Innovate UK  PROWLER.io™
the principled AI company

 UNIVERSITY OF
CAMBRIDGE



Artificial Intelligence

Underlying technologies – how they work and how they are applied

3rd October 2017

Hosted by The Computer Labs, Cambridge

Venue: The Computer Labs, Cambridge, William Gates Building, 15 JJ Thomson Ave, Cambridge, CB3 0FD

About the event

We will be focusing on the technologies underlying the burgeoning field of Artificial Intelligence. As seemingly limitless applications are increasingly discussed in the press we will look past this hype, focusing on three key themes:

- What are the key and emerging AI technologies and how are they combined to drive current and future applications?
- What are the trade-offs between the increasing number of tools and frameworks and how far can they really take us?
- What are the implications for hardware, network infrastructure and storage - what are the limiting challenges, and what is on the horizon to make this more tractable?

The 3rd CW TEC is aimed at technology leaders in industry, as well as young engineers and data scientists, to give them an overview of the subject and to critically examine the associated challenges. Speakers will include leaders in AI research and development from universities and industry

About CW

Cambridge Wireless (CW)

CW is the leading international community for companies involved in the research, development and application of wireless and mobile, internet, semiconductor and software technologies. With over 400 members from major network operators and device manufacturers to innovative start-ups and universities, CW stimulates debate and collaboration, harnesses and shares knowledge, and helps to build connections between academia and industry. CW's 20 Special Interest Groups (SIGs) provide its members with a dynamic forum where they can network with their peers, track the latest technology trends and business developments and position their organisations in key market sectors. CW also organises major conferences and start-up competitions along with other high-quality industry networking events and dinners. With headquarters at the heart of Cambridge, UK, CW partners with other international industry clusters and organisations to extend its reach and remain at the forefront of global developments and business opportunities. www.cambridgewireless.co.uk

Thank you to our sponsors and supporters that have made this conference possible:



Innovate UK



Profile of host

The Computer Laboratory, University of Cambridge

The Computer Laboratory is an academic department within the University of Cambridge that encompasses Computer Science, along with many aspects of Engineering, Technology and Mathematics. It consists of 44 academic staff, 30 support staff, 7 research fellows, 102 post-doctoral research workers and 121 PhD students. We have over 300 undergraduates studying for Part I, II and III of the Computer Science Tripos and 36 graduate students studying for the MPhil in Advanced Computer Science. Its current research areas include bioinformatics, computer architecture, computer vision, distributed systems, graphics and human-computer interaction, logic and semantics, machine learning, natural language processing, networking and wireless communication, operating systems and virtualization, programming, security, and sustainable computing. www.cl.cam.ac.uk



AGENDA

09:30 Registration and networking with refreshments

10:00 Welcome from CW (Cambridge Wireless)

Robert Driver, CEO, CW

Welcome from our host The Computer Labs

Dr Ian Wassell, Senior Lecturer, **University of Cambridge Computer Laboratory**

A word from our headline sponsor Magna

David Paul, Director, Corporate Engineering and R&D, **Magna International**

Scene setting

10:15 The Landscape of AI

Phil Claridge, Founder, **Mandrel Systems**

Peter Whale, Founder, **Peter Whale Consulting**

An introduction from the AI SIG Champions to the conference day, the key topics to be covered, the structure of the day, and some of the engineering design questions to be covered.

Key and emerging AI technologies

10:30 The near-term impact of AI

Professor Steve Young, Professor of Information Engineering, **University of Cambridge**

A review of the major algorithmic approaches and technological advances that are driving the current uptake of AI.

10:55 Under the covers of Deep Learning

Theophane Weber, Senior Research Scientist, **Google DeepMind**

What is Deep Learning? How is it different from classic neural nets? How is this informed from our understanding of the human brain? What is Deep Learning is good for and not so good for.

11:20 Refreshments and networking

11:50 Under the covers of a range of other AI technologies

Professor Carl Edward Rasmussen, Professor of Machine Learning, **University of Cambridge** and Chairman, **PROWLER.io**

This is the counter point to the session on Deep Learning, where we explain some of the other promising areas of AI such as Probabilistic models, Reinforcement Learning (RL) and Multi-agent Systems (MAS).

12:15 The revolution of speech recognition technology

Dr Tony Robinson, Founder & CTO, **Speechmatics**

Speech recognition technology is revolutionising the industry – but how do you make speech recognition work for you?

12:35 Panel Session with audience Q&A

12:55 A word from our sponsor PROWLER.io

Vishal Chatrath, CEO and Co-founder, **PROWLER.io**

13:00 Lunch and networking

Tools, Frameworks and AI Systems Engineering

13:55 Where next for AI?

Professor Neil Lawrence, Professor of Machine Learning, **University of Sheffield**

A brief look at some of the most promising areas of AI research which could be brought to market in the next 2-3 years.

14:20 Survey of Tools and Frameworks

Dan Neil, Lead Machine Learning Researcher, **Benevolent AI**

This talk will look at the capabilities of the increasing number of tools and frameworks for AI, and how far they can take us currently. We will then reflect on Benevolent's experience of area where we have needed to augment these with our own in-house tools.

14:40 NVIDIA's Artificial Intelligence Platform

Alison B Lowndes, Artificial Intelligence Developer Relations, EMEA, **NVIDIA**

This talk will combine knowledge of world-wide state-of-the-art research, with NVIDIA's ecosystem of software, research, training, support and of course hardware. Chips are one part of enabling AI, a field moving faster than chips can be produced. That momentum drives efficiency and forces agility, allowing us to enable AI across the world's data centres, clouds & 'at the edge'. Discussion will include the tools we open source and optimize with partners across academia & Enterprise as well as hints along the path to AGI through neuroscience, and what that means for the real world.

15:00 Why do we need another processor (solution?) for AI

Simon Knowles, Co-founder & CTO, **Graphcore Ltd.**

This talk will cover how to design a processor for Machine Intelligence. It will describe the underlying compute workload in today's and future Machine Intelligence applications. It will show how current CPU and GPU processors are limited in their ability to support this new workload and how a new type of intelligence processing unit can be developed which is much more efficient for this fundamental new era of computers.

15:20 Processors for real-world AI

Dr Peter Baldwin, Founder, **Myrtle Software**

Dr David Page, Chief Scientist, **Myrtle Software**

A number of different processor architectures have been proposed for deployment in AI applications. In this talk, we discuss trade-offs of the alternative approaches for current and future workloads.

15:40 AI: open for all? Panel session

Chaired by **Sobia Hamid**, Founder, **Cambridge Data Insights**

AI will have an increasing impact on business and wider society but can seem like it is driven by a very select set of people. This panel discussion explores the issues we need to resolve to have AI be open to all.

16:00 Refreshments and networking

Tools, Frameworks and AI Systems Engineering cont.

16:30 Community-driven AI/SW/HW co-design and optimisation

Anton Lokhmotov, CEO, **dividiti**

Keeping up with the fast pace of AI innovation calls for an agile system approach that engages the community in a virtuous co-design and optimisation cycle, where the design of AI applications is informed by the capabilities of computer systems and the design of computer systems is informed by AI applications.

16:50 System Architectures for AI

Jem Davies, Fellow and General Manager, Machine Learning, **Arm Ltd**

AI and Machine Learning are currently generating a huge number of headlines. As the near ubiquitous computing platform on devices, Arm has a unique view on the technology and the different implementation approaches needed to make it a success. As AI/ML workloads increase in number and complexity, Jem will discuss how Arm views the challenges, options and opportunities presented, and what is being done to address these new workloads.

17.10 AI on the Edge

Cyrus Vahid, Principal Solutions Architect, **Amazon (AWS)**

What drives the partitioning of edge v. cloud? How intelligent can the edge be and how intelligent do we want it to be? Does the edge device really learn?

17:30 Panel Session with audience Q&A

Chaired by **James Chapman**, VP Product Management, **Qualcomm**

17:55 Closing remarks

18:00 Event close

With the permission of the speakers, presentations will be loaded to the CW website within two weeks of the event

Conference Sponsors and supporters

Magna

Magna is a leading global automotive supplier with 312 manufacturing operations and 93 product development, engineering and sales centers in 29 countries. Magna has over 155,000 employees focused on delivering superior value to its customers through innovative processes and World Class Manufacturing. At Magna, we take great ideas and develop them from innovation to industry standard. We also know that great thinking happens outside our four walls, and that our ability to commercialise great ideas benefits inventors, entrepreneurs, customers, and ultimately all who share the road. www.magna.com

Innovate UK

Innovate UK is the UK's innovation agency. Innovate UK works with people, companies and partner organisations to find and drive the science and technology innovations that will grow the UK economy - delivering productivity, new jobs and exports. Our aim at Innovate UK is to keep the UK globally competitive in the race for future prosperity. www.gov.uk/government/organisations/innovate-uk

PROWLER.io

PROWLER.io is the Cambridge-based creator of the first principled A.I. decision-making platform. Its world-class team of experts in probabilistic modelling, machine learning and multi-agent systems is building the platform on a foundation of interpretable principles of mathematics and decision theory. PROWLER.io empowers customers to optimise the millions of micro-decisions that can occur in complex, dynamic systems such as online games, autonomous vehicles and smart cities. www.prowler.io

Myrtle Software

Myrtle accelerates performance critical workloads on FPGAs : devices that are currently being deployed at scale in data centers around the world. Myrtle has realized multiple proprietary deep learning networks as silicon designs so that they execute at a latency and power point that makes them usable in real-world situations. Myrtle is currently targeting its technology at inference workloads in data centers and is involved in a major collaboration to address the safety and verification challenges that currently preventing sophisticated deep learning networks being used in road vehicles

Organising Committee and Chairs

Laurent Brisedoux, Software Development Manager, Amazon

Laurent Brisedoux has been heading the Amazon R&D team in Cambridge, part of the Lab126 organization, since its creation in 2014. His group is responsible for developing application, device and cloud software for Amazon's consumer electronic devices such as Kindle, Fire tablets, Fire TV, Dash, Echo and many more innovative products to come. Prior to that, Laurent was in charge of the development and productisation of imaging technologies at Broadcom, managing a group of 50 people across multiple locations worldwide. He joined the Broadcom Mobile Multimedia group in 2004 with the acquisition of Alphamosaic, one the Silicon Fen 'success stories'. Laurent is also a junior angel investor and working with several technology start-ups in the Cambridge area.

James Chapman, VP Product Management, Qualcomm

James is Qualcomm's VP responsible for its roadmap of Voice & Music products. Before joining Qualcomm as part of the acquisition of CSR, he was responsible for CSR's connectivity product line. Prior to CSR James has held senior software management roles at Broadcom; he was also the Head of Research for TTP Communications. James' 20 years in the high-tech industry started with a degree and PhD in theoretical Condensed Matter Physics from the University of Oxford.

Phil Claridge, Founder, Mandrel Systems

Phil Claridge is a 'virtual CTO' for hire within Mandrel Systems covering end-to-end systems. Currently having fun and helping others with large-scale AI systems integration, country-wide large scale big-data processing, hands-on IoT technology (from sensor hardware design, through LoRa integration to back end systems), and advanced city information modelling. Supporting companies with M&A 'exit readiness', due-diligence and on advisory boards. Past roles include: CTO, Chief Architect, Labs Director, and Technical Evangelist for Geneva/Convergys (telco), Arieso/Viavi (geolocation), and Madge (networking). Phil's early career was in electronics, and still finds it irresistible to swap from Powerpoint to a soldering iron and a compiler to produce proof-of-concepts when required.

Robert Driver, CEO, CW

Bob joined CW in May 2015 with a focus on leading the development of the organisation, broadening its reach with other sectors and clusters, while retaining the unique culture and dynamism of the CW community. Working with the Events team, Bob is strategy lead for a number of Special Interest Groups (SIGs) and recently joined the editorial panel for the company's latest venture; CW Journal, a quarterly publication advocating strong tech thought leadership within the wider CW community. Prior to working at CW, Bob was Director for Technology at UK Trade & Investment [UKTI] where he successfully led teams helping UK tech companies to access overseas opportunities as well as attracting technology inward investment into the UK. He also coordinated the UKTI science and innovation agenda and was responsible for the delivery of UKTI events from small missions to large trade fairs.

Peter Whale, Founder, Peter Whale Consulting

Peter is a technologist and business leader, with a long track record of conceiving, developing and marketing successful technology-based solutions, which have touched the lives of many millions of people. Currently exploring transformative possibilities in AI, IoT and future connected devices. Peter is co-author of the 'Essentials of Mobile Handset Design', published by Cambridge University Press. Peter is a board member of Cambridge Wireless, and is a champion of the CW Artificial Intelligence SIG and Future Devices SIG.

Profile of Speakers (A-Z)

Dr Peter Baldwin - Founder, Myrtle Software

Peter has a pure mathematics PhD from Cambridge University and has a special interest in the mathematical foundations of deep learning. Myrtle accelerates performance critical workloads on FPGAs devices that are currently being deployed at scale in data centres around the world. Myrtle has realized multiple proprietary deep learning networks as silicon designs so that they execute at a latency and power point that makes them usable in real-world situations. Myrtle is currently targeting its technology at inference workloads in data centres and is involved in a major collaboration to address the safety and verification challenges that currently preventing sophisticated deep learning networks being used in road vehicles.

Vishal Chatrath, CEO and Co-founder, PROWLER.io

Vishal Chatrath is CEO and co-founder of PROWLER.io, a Cambridge-based developer of principled AI decision-making technologies that help customers understand, guide and optimise the millions of micro-decisions that occur in complex, dynamic environments. Its world-class researchers and engineers are transforming fields like systems engineering, autonomous vehicles, game design, and smart city planning. Vishal was previously head of automotive at Nokia, founder of Chleon Automotive and Chief Business Officer of VocalIQ, which was acquired by Apple in 2015. He focuses on turning ground-breaking research into workable solutions.

Jem Davies - VP, GM and Fellow, Media Processing Group, ARM

Jem is an Arm Fellow and the General Manager for Arm's recently formed Machine Learning business, focusing on Machine Learning and Artificial Intelligence solutions. Jem was previously GM and vice-president of technology for the Media Processing Group and Imaging and Vision Groups. In addition to setting the future technology roadmaps for graphics, video, display and imaging, he was also responsible for technological investigations for several acquisitions leading to formation of the Media Processing Group, and most recently Apical, forming the Imaging and Vision Group. Based in Cambridge, Jem has previously been a member of ARM's Architecture Review Board and he holds four patents in the fields of CPU and GPU design. He has a degree from the University of Cambridge.

Sobia Hamid - Founder, Cambridge Data Insights

Sobia is founder of Cambridge Data Insights, helping organisations to improve performance through the application of AI and machine learning. Also founder of CancerPDX; a 'Genetic Risk and Refer' platform for the early identification and management of inherited cancers, Sobia previously worked as a Senior Investment Associate at Invoke Capital. She holds a PhD in Epigenetics from the University of Cambridge, and an MSc in Cognitive Neuroscience from Imperial College London.

Simon Knowles, Co-founder & CTO, Graphcore Ltd

Simon is co-founder & CTO of Graphcore. Simon has a strong track record as both engineer and entrepreneur, having co-founded and exited two highly successful fabless semiconductor companies, Element14 and Icera, for a combined value of over \$1 billion. Before that he headed the microprocessor development group at ST Micro. He is well known as a leading microprocessor designer, responsible for ground-breaking designs at STMicro, Element14, and Icera. He holds an MA in Electrical Science from Cambridge University and is the author of 14 issued patents.

Professor Neil Lawrence - Professor of Machine Learning, University of Sheffield

Neil Lawrence leads Amazon Research Cambridge where he is a Director of Machine Learning. He is on leave of absence from the University of Sheffield where he was a Professor in Computational Biology and Machine Learning jointly appointed across the Departments of Neuroscience and Computer Science. Neil's main research interest is machine learning through probabilistic models. He focuses on both the algorithmic side of these models and their application. He has a particular focus on applications in personalized health and computational biology, but happily dabbles in other areas such as speech, vision and graphics. Neil was Associate Editor in Chief for IEEE Transactions on Pattern Analysis and Machine Intelligence (2011-2013) and is an Action Editor for the Journal of Machine Learning Research. He was the founding editor of the Proceedings of Machine Learning Research (2006) and is currently series editor. He was an area chair for the NIPS conference in 2005, 2006, 2012 and 2013, Workshops Chair in 2010 and Tutorials Chair in 2013. He was General Chair of AISTATS in 2010 and AISTATS Programme Chair in 2012. He was Program Chair of NIPS in 2014 and was General Chair for 2015. He is one of the founders of the DALI Meeting and Data Science Africa.

Anton Lokhmotov - CEO, dividiti

Anton Lokhmotov is CEO and founder of dividiti. The main focus of dividiti is on Collective Knowledge (CK), an open technology, platform and initiative for accelerating AI R&D by crowdsourcing interdisciplinary design and optimisation knowledge. CK is contributed to by engineers and researchers working on AI applications, software and hardware, across industry and academia in 2010-2015, Anton led development of GPU Compute programming technologies for the ARM Mali GPUs, including production and research compilers, libraries and performance analysis tools. In 2008-2009, Anton was a post-doctoral research associate at Imperial College London. Anton obtained a PhD in Computer Science from the University of Cambridge Computer Laboratory in 2007, and an MSc in Applied Mathematics and Physics from the Moscow Institute of Physics and Technology in 2004.

Alison B Lowndes - Artificial Intelligence Developer Relations, EMEA, NVIDIA

After spending her first year with NVIDIA as a Deep Learning Solutions Architect, Alison is now responsible for NVIDIA's Artificial Intelligence Developer Relations in the EMEA region. She is a mature graduate in Artificial Intelligence combining technical and theoretical computer science with a physics background & over 20 years of experience in international project management, entrepreneurial activities and the internet. She consults on a wide range of AI applications, including planetary defence with NASA & the SETI Institute and continues to manage the community of AI & Machine Learning researchers around the world, remaining knowledgeable in state of the art across all areas of research. She also travels and advises, teaches and evangelizes NVIDIA's platform, around the globe.

Daniel Neil - Lead Machine Learning Researcher, Benevolent AI

Daniel Neil is a lead machine learning researcher at BenevolentAI which has key research areas around NLP and machine reading, generative models, and human-centric AI development for drug discovery and chemistry applications. Formerly, Daniel was a research assistant in Kwabena Boahen's Brains in Silicon Laboratory at Stanford, helping to build the lowest-power neuron supercomputer Neurogrid, and worked as a technical strategy consultant in the San Francisco Bay Area. He was also a co-founder of Ponder, a site to discover intellectual events. Daniel received his B.S. degree in Biomedical Computation from Stanford with a thesis on protein simulation. He subsequently completed his master's degree in Neural Systems and Computation at ETH Zurich, and received his doctorate there codeveloping hardware and optimized machine learning algorithms. His highest-impact publications have combined neuroscience, hardware, and algorithms to produce novel recurrent neural network algorithms in biologically plausible computing substrates. Currently, his research interests focus on applying deep models to hard problems in generative modeling for chemistry and biology. Specifically, he focuses on analyzing and building deep neural networks designed to cope with small or imbalanced data, combining semi-supervised and generative techniques, and exploring discrete and continuous spaces.

Dr David Page, Chief Scientist, Myrtle Software

David has a background in mathematics and theoretical physics. He completed a PhD at Durham University and postdoctoral research at the University of Toronto. After a long period in industry managing Quantitative Analysis teams, he returned to research in the areas of machine learning and theoretical neuroscience. His interests are in understanding the type of algorithms that can allow intelligent agents to operate safely and effectively in complex, dynamic environments. This will require a deeper understanding of the statistical properties of learning algorithms, in order to guarantee robustness and safety, and also algorithmic advances to handle the rich problem solving capabilities needed for this kind of behaviour.

David Paul - Director, Corporate Engineering and R&D, Magna International

David Paul has served as Director, Corporate Engineering and R&D since 2014. In this role David is responsible for identifying innovation opportunities for Magna from startups, SME's, Universities, etc. He has worked in the automotive industry for 38 years, beginning his career with an Engineering Apprenticeship then Mechanical Engineering at Loughborough University (sponsored by Jaguar Cars Ltd) and later became a key member of Jaguar's design team for their first V8 engine. Upon leaving Jaguar in 1995, David joined Magna International's Powertrain division and in 2007 set up his own Company to support SME's and Innovate UK in the low carbon vehicle sector before rejoining Magna in 2014.

Professor Carl Edward Rasmussen - Professor of Machine Learning, University of Cambridge and Chairman, PROWLER.io

Prof. Carl Edward Rasmussen is a professor of Machine Learning and head of the Computational and Biological Learning Lab at the Department of Engineering of the University of Cambridge. He is also the Chairman at PROWLER.io. He has extensive interests in probabilistic inference in machine learning, covering unsupervised, supervised and reinforcement learning. He is particularly interested in design and evaluation of nonparametric methods such as Gaussian processes (GPs) and Dirichlet processes. Exact inference in these models is often intractable, so one needs to resort to approximation methods, such as variational techniques or Markov chain Monte Carlo. He has co-authored a book with Chris Williams, entitled "Gaussian Processes for Machine Learning", MIT Press, 2006. Gaussian processes are a principled, practical, probabilistic approach to learning in kernel machines. This standard reference for GPs is accompanied by open source software tools.

Dr Tony Robinson - Founder & CTO, Speechmatics

Tony pioneered recurrent neural networks in speech recognition and has built and scaled multiple speech groups and companies. Tony's passion is the development and application of machine learning to tasks that traditionally had been considered impossible for computers to solve.

Cyrus Vahid - Principal Solutions Architect, Amazon (AWS)

Cyrus Vahid is a Principal Solutions Architect at AWS Deep Learning. He has a background in Machine Learning and Artificial Intelligence with a focus on Neural Networks. Before joining AWS Cyrus was Principal Domain Architect at Redhat. He is a software specialist with focus on integration and analytics. Over the past 20 years he has delivering innovative solutions with a track-record of success stories mostly in entrepreneurial environments. For the past 3 years he has been dedicated to Big Data initiatives and solutions.

Théophane Weber - Senior Research Scientist, Google DeepMind

Theo is a senior research scientist at DeepMind. His research interests span probabilistic modeling, deep learning and deep reinforcement learning, and fundamentals of imagination and intuitive reasoning in artificial intelligence. Previously, he worked at Lyrics Labs (later acquired by Analog Devices), applying machine learning techniques to physical world problems. He holds an M.S. and Ph.D from MIT in Operations Research and an M.S. from Ecole Centrale Paris in Applied Mathematics.

Dr Ian Wassell, Senior Lecturer, University of Cambridge Computer Laboratory

Dr Ian Wassell joined the University of Cambridge Computer Laboratory as a Senior Lecturer in January 2006. Prior to this, he was with the Department of Engineering for six years. He received the PhD degree from the University of Southampton in 1990 and the BSc., BEng. (Honours) Degrees (First Class) from the University of Loughborough in 1983. He has in excess of 25 years' experience in radio communication systems gained via positions in industry and academia and has published more than 200 papers. His research interests include broadband wireless networks, wireless sensor networks, radio propagation, coding, communication signal processing, compressive sampling, and image processing and classification.

Professor Steve Young - Professor of Information Engineering, University of Cambridge

Steve Young is Professor of Information Engineering at Cambridge University where he has previously served terms as Head of the School of Technology and Senior Pro-Vice Chancellor. His main research interests lie in the area of statistical spoken language systems including speech recognition, speech synthesis and dialogue management. He is the recipient of a number of awards including an IEEE Signal Processing Society Technical Achievement Award, an ISCA Medal for Scientific Achievement and an IEEE James L Flanagan Speech and Audio Processing Award. He is a Fellow of the Royal Academy of Engineering and the Institute of Electrical and Electronics Engineers (IEEE).

In addition to his academic career, he has also founded three successful startups in the Speech Technology area. Entropic Inc was acquired by Microsoft in 1999, Phonetic Arts was acquired by Google in 2010 and VocalIQ was acquired by Apple in 2015. He is now a Senior Member of Technical Staff in the Apple Siri Development team based in Cambridge, UK, a post held jointly with his University professorship.

Delegate List		
Name	Organisation	Profile
Zoubida Abdelkader	Invest Quebec	Economic development agency and financial organisation
Wil Addison	Cambridge Consultants	Research & Development
Daniel Addison	AstraZeneca	
Dev Amratia	BEIS	Central Government
Yuri Andersson	Nabla Ventures	Deep technology startup advisory
Daniel Ansorregui	Samsung	Samsung Electronics Android Graphics
Amelia Armour	Amadeus Capital Partners	Venture Capital
Abid Athankutty	Samsung Cambridge Solution Centre	Research and development of connectivity parts for samsung phones
Dev Audsin	Beko	
Stuart Baker	Nokia	Nokia Technologies: Inventing and accelerating new technologies
Andrew Baldrian	Viavi Solutions	Geolocation, performance engineering and optimisation solutions for carrier wireless systems.
Peter Baldwin	Myrtle Software	Speaker
Myles Bannister	Artesis	
Steve Barlow	Argon Design	Design services in board level electronics, software and RTL.
David Bartlett	u-blox UK	Electronic chip, component and module supplier to PNT, cellular and wireless markets.
Daniel Bates	University of Cambridge	
Khan Baykaner	Nokia Technologies	Develops advanced consumer & professional technology products in digital health and digital media.
Roy Bookham	Dstl	MOD Research Organisation
Will Boulton	Artesis LLP	Providers of condition monitoring services for rotating equipment
John Bourassa	PROWLER.io	Sponsor
Edward Briffa	ConsumerHealth Consulting Ltd	
David Brinck	EIP Europe LLP	Intellectual property firm specialising in digital and computer-implemented technology
Laurent Brisedoux	Amazon Cambridge Development Center	CW Artificial Intelligence SIG Champion & CWTEC Organising Committee
Tony Bryant	Enterprise Foods Ltd	We connect local food suppliers to national retail and food service customers
Craig Burgess	Aseptika Ltd	Aseptika develops the Activ8rlives health and wellness platform
Natalia Burton	OMNETRIC	

Karen Campa	Skyscanner	Design Informatics Research Center
Mark Catchpole	Wearable Consultants	Wearable Technology Consultants
Phil Catton	University of Cambridge	
Rafael Cepeda	InterDigital Europe	
George Cevora	illumr	illumr provides tools for Topological Data Analysis - revealing complex patterns in data
Rick Chandler	Airworking	
Natarajan Chandrasekhar	Cognizant	Global IT services & solution provider
James Chapman	Qualcomm Technologies International	CW Artificial Intelligence SIG Champion & CWTEC Organising Committee
Vishal Chatrath	PROWLER.io	Sponsor
Liang Chen	RS Components Ltd	
Wai-chuen Cheung	Klydo	
Carol Cheung	Cambridge Innovation Capital plc	
David Chik	Anglia Ruskin University	Education & Research
Mary-Ann Claridge	Mandrel Systems	
Phil Claridge	Mandrel Systems	CW Artificial Intelligence SIG Champion & CWTEC Organising Committee
Luke Collins	The Curation Company	
Vic Cornell	DataDirect Networks (DDN)	Leading provider of high performance, high capacity analytics storage systems to global companies.
Chris Coull	ANSYS UK Ltd	We help the world's most innovative companies deliver radically better products to their customers.
Katherine Dainty	Venner Shipley LLP	European Patent and Trademark Attorneys
Gordon Dalgleish	Arvato UK & Ireland	BPO organisation for government and contact centre services
Taha Dar	SearchSmartly	We are an early-stage propertytech startup changing the way people search for their next home.
Jem Davies	Arm Ltd	Speaker
Emanuela Denaro	ThoughtRiver Ltd	ThoughtRiver uses AI and NLP to address the insight gap in today's contract processes.
Gareth Derbyshire	IoTAS	Wireless Testing Organisation
Philip Derrick	Nokia	Nokia Technologies: Inventing and accelerating new technologies
Mehrdad Dianati	WMG, University of Warwick	
Graeham Douglas	Arete Medical Technologies Ltd	Medical devices and software for personalised and preventative management of chronic diseases
Conor Doyle	Atlantic Bridge	
Virginia Driver	Page White & Farrer	

Robert Driver	CW (Cambridge Wireless)	Organising Committee
Krittika D'Silva	University of Cambridge	
Krishna Dubba	Nokia Technologies	Develops advanced consumer & professional technology products in digital health and digital media.
Adel Eisa	IC Resources	IC Resources is the recognised technology recruitment partner to the global tech community.
Pirow Engelbrecht	TTP plc	Engineering Innovation & Consultancy
Stirling Essex	Espansivo	Helping organisations make better strategic decisions in technology, product design and marketing
Gideon Farrell	Converge	Converge builds wireless sensor networks and data analytics to make Industry more efficient
Andrew Faulkner	TTP plc	Engineering Innovation & Consultancy
Taras Filatov	Covijn Ltd	Computer vision and automation solutions
Graham Fisher	BathCube Telecoms and Innovation Consultants	
Larissa Fradkin	Sound Mathematics Ltd	
Andy Gardner	Enterprise Foods Ltd	We connect local food suppliers to national retail and food service customers
Aygul Garifullina	BT	
Maximilian Ge	Cambridge University Technology and Enterprise Club	Fostering tech entrepreneurship at the University of Cambridge
Billy Gibson	Cambridge Connected Technologies	Remote diagnostics for mobile devices
Paul Gillespie	Gillamor Stephens	Building the exec and non-exec teams for start-ups across Europe
Paul Gough	u-blox UK	Electronic chip, component and module supplier to PNT, cellular and wireless markets.
Andreas Grammenos	Alan Turing Institute	The ATI is the national institute of data science trying to unlock the value of massive data
Tom Hall	Martlet	
Dr Sobia Hamid	Cambridge Data Insights	Speaker
John Harper	Rize	Mental health app integrating therapeutic concepts into interactive exercises
Martin Harris	Tumika Ltd	Mobile for Development Consultancy
Julian Hildersley	Vision Leaders	Technology leadership development
Michael Hill-King	Huawei Technologies Co Ltd	Huawei is a leading telecommunication company and now is also expanding to cloud, consumer areas.
Marcin Hlond	UltraSoC	Silicon debug IP provider
Mekhola Hoff	Addenbrooke's Hospital	Hospital
Tony Hooley	HRL	Research Laboratory
Mark Hsieh	TTP plc	Engineering Innovation & Consultancy

Li-Ke Huang	Cobham Wireless	T&M Vendor
Jools Hudson	Stratimize Ltd	Stratimize helps organisations maximise profitability by matching technology with market opportunity
Dom Hudson	ThoughtRiver Ltd	ThoughtRiver uses AI and NLP to address the insight gap in today's contract processes.
Fern Hugill	Ruder Finn	Public relations firm specialising in tech and healthcare
Mash-Hud Iqbal	Marks & Clerk	Marks & Clerk are a full service IP firm that can help to protect, defend and value your inventions.
Anton Isopoussu	Nokia Technologies	Develops advanced consumer & professional technology products in digital health and digital media.
Pauliina Jamsa	Siemens	Technology and engineering company involved in industry IoT etc
Murray Jarvis	Qualcomm	
ST John	PROWLER.io	Sponsor
Tom Jones	Satellite Applications Catapult	
Joshua Jones	10 Creative	10 Creative are a Branding and Web Agency specialising in Cambridge Tech Startups.
Matthew Jones	Abcam	Providers of research antibodies.
Jamie Jones	NI	Leader in Test and Measurement Platforms
Vaiva Kalnikaite	Dovetailed	Dovetailed are a user experience (UX) and innovation consultancy located in central Cambridge.
Chris Keely	Trinity College	Trinity College Dublin
Mark Keenan	Joint Analytics	Moving Image scanning technology for functional assessment of musculoskeletal conditions
Said Kenj	Cyberlytic	Advanced Web Application Security leveraging AI
Sermin Kilvan	Techdoor Solutions LTD	We provide assistance to our customers in developing their products in their markets.
Simon King	Octopus Ventures	
Paul Kirkland	University of Strathclyde	
Frank Knowles	New Street Research	Research and consultancy
Simon Knowles	Graphcore	Speaker
Arvid Kongstad	Amazon Lab126	Creates devices for smart homes and media consumption
Kamran Kordi	floor51	
John Kourentis	Arm Ltd	
Florian Kreyssig	University of Cambridge	
Michal Krol	UCL	
Christopher Lancaster	Plextek	
Nicholas Lane	University of Oxford & Nokia Bell Labs	
Greg Law	Undo	

Neil Lawrence	University of Sheffield	Speaker
Tom Lawrie-Fussey	Cambridge Design Partnership	
Jake Levi	Cambridge University Engineering Department	3rd year undergraduate engineer specialising in information engineering and machine learning
Hongwei Li	Nokia	Nokia Technologies: Inventing and accelerating new technologies
Viviana Lobosco	Vodafone	
Anton Lokhmotov	dividiti	Speaker
Derek Long	Cambridge Consultants	Research & Development
Pantea Lotfian	Camrosh Ltd.	Technology and innovation strategy consulting
Alison Lowndes	NVIDIA	Speaker
Sylvia Lu	u-blox UK	Electronic chip, component and module supplier to PNT, cellular and wireless markets.
Richard Lui	Essex University - CSEE	
Ben Maling	EIP	Intellectual property firm specialising in digital and computer-implemented technology
Rishi Mandyam	Skyships Automotive Ltd	Automotive technology company
Richard Mansfield	DataDirect Networks (DDN)	Leading provider of high performance, high capacity analytics storage systems to global companies.
Josh Marshall	University of Essex	
Fernando Martin	Cambridge Consultants	Research & Development
Enrique Martin Lopez	Nokia	Nokia Technologies: Inventing and accelerating new technologies
George Matich	Leonardo MW Ltd	Leonardo is a Systems Solutions provider for the global Aerospace and Defence market place.
Mark McAllister	TTP plc	Engineering Innovation & Consultancy
Nathan McCoy	ThoughtRiver Ltd	ThoughtRiver uses AI and NLP to address the insight gap in today's contract processes.
Lottie Michael	ThoughtRiver Ltd	ThoughtRiver uses AI and NLP to address the insight gap in today's contract processes.
Jonathan Mitchener	Innovate UK	Innovate UK is the UK's Innovation Agency helping support and fund Business-led innovation
Tim Moore	ghd	Beauty industry market leader
Paul Morris	Qualcomm	
Federica Moscato	Satellite Application Catapult	
Anne Mottram	Klydo	Our vision is to help companies to innovate by enhancing creative problem solving with AI
Tim Murdoch	Cambridge Consultants	Research & Development
Pramod Mynampati	TTP plc	Engineering Innovation & Consultancy
Philip Naylor	Carpmaels & Ransford	Top tier IP firm

Daniel Neil	Benevolent AI	Speaker
Elena Nemtseva	d&a solutions	Freelance data scientist
Tom Nicholson	PROWLER.io	Sponsor
Michael James Norton	Applegate Marketplace Ltd	Specialist engineering directory and procurement site
Lindsay O'Regan	Flex	
Dave Padfield	Viavi Solutions	Geolocation, performance engineering and optimisation solutions for carrier wireless systems.
Lewis Page	CW Journal	
Karina Palyutina	Nokia Technologies	Develops advanced consumer & professional technology products in digital health and digital media.
David Paul	Magna International	Sponsor
Hendrik Pavel	Enterprise Europe Network	We help you find partners in Europe whilst we are still there
David Peacock	Intralink	Tech Scouting
Bartosz Perz	Amazon	
Mike Powell	Gillamor Stephens	Building the exec and non-exec teams for start-ups across Europe
Rebekkah Provine	ThoughtRiver Ltd	ThoughtRiver uses AI and NLP to address the insight gap in today's contract processes.
Hannah Rafferty	Ruder Finn	Public relations firm specialising in tech and healthcare
Carl Edward Rasmussen	PROWLER.io	Speaker
Howard Read	Appleyard Lees IP LLP	European Patent and Trade Mark Attorneys
Andrew Richardson	Eastpoint Software	Software design and development
Toby Richt	IC Strategic	
David Robertson	Stewart Technology Ltd	Electronic manufacturing services, procurement, system assembly, test, design
Dr Tony Robinson	Speechmatics	Speaker
Daniel Roythorne	Cambridge Consultants	Research & Development
Mike Sales	CellMetric	
Francisco Santos	Samsung Electronics	
Andrew Sanyal	Orbitil	
Karthikeyan Saravanan	Samsung Electronics	
Nick Schweitzer	Klydo	Our vision is to help companies to innovate by enhancing creative problem solving with AI
Abhishek Sen	NumberEight	NumberEight pioneers AI tech to improve passenger experience in mobility.
Sandra Servia-Rodriguez	University of Cambridge, Computer Laboratory	
David Sharp	Ocado	Ocado is the world's largest online-only grocer and it sells e-commerce and grocery robotics systems

Hamed Siasi	u-blox UK	Electronic chip, component and module supplier to PNT, cellular and wireless markets.
Chris Smart	Acacia Capital Partners	
Gareth Smith	Testplant	Testplant enables amazing digital experiences via true, user-centric, end-to-end test automation
Lori Kate Smith	Arm Ltd	
Andrew Smyth	Atlantic Bridge	
Bethany Spalding	IoTAS	Wireless Testing Organisation
Vidhya Sridhar	TTP plc	Engineering Innovation & Consultancy
Benjamin Storey	Barclays	
Charles Sturman	u-blox UK	Electronic chip, component and module supplier to PNT, cellular and wireless markets.
Sam Sutcliffe	TTP plc	Engineering Innovation & Consultancy
Valentin Tablan	Ieso Digital Health	
Eser Takmaz	Desbridge Technology Solutions LTD.	
Ben Tarlow	Qualcomm	
Venkata Tata	Eastpoint Software	Software design and development
Kevin Thomas	Leonardo MW Ltd	Leonardo is a Systems Solutions provider for the global Aerospace and Defence market place.
Dan Timson	CRFS Ltd	Real-time RF spectrum monitoring solutions for regulatory, defence, aerospace and security agencies
Anthony Tomlinson		
Catherine Tong		
Anvar Tukmanov	BT	
Chris Turner	Arm Ltd	
Yoann Turpin	Industria	Proprietary trading group with interest in AI both in financial markets and startups
Cyrus Vahid	Amazon (AWS)	Speaker
Cyril Valadon	MediaTek (MTK Wireless Limited)	MediaTek's system-on-chip semiconductors power more than 1.5 billion consumer products a year.
Alex van Someren	Amadeus Capital Partners	Venture Capital
Agnelo Vaz	Samsung UK	Samsung Research UK subsidiary, research technologies to aid products
Henry Vickers	MediaTek (MTK Wireless Limited)	MediaTek's system-on-chip semiconductors power more than 1.5 billion consumer products a year.
Miquel Vidal	CBRE Life Science	Integrated Laboratory Solutions (ILS) team is dedicated to supporting and enhancing science
Geoff Walker	Artesis LLP	Providers of condition monitoring services for rotating equipment
Joseph Walmswell	Abcam	Providers of research antibodies.

Ian Wassell	Digital Technology Group, Computer Laboratory, University of Cambridge	Host
Chris Watts	NumberEight	NumberEight pioneers AI tech to improve passenger experience in mobility.
Steve Watts	CambridgeIQ	Technology and business services
Théophane Weber	Google DeepMind	Speaker
Patricia Wells	NEC Telecom MODUS	Telecoms Research and Development
Ben Whale	University of Birmingham	
Peter Whale	Peter Whale Consulting	CW Artificial Intelligence SIG Champion & CWTEC Organising Committee
Steven Williamson	CRFS Ltd	Real-time RF spectrum monitoring solutions for regulatory, defence, aerospace and security agencies
Andrew Williamson	Cambridge Innovation Capital plc	
Trevor Wood	Cambridge Consultants Ltd	Research & Development
Gemma Wooden	EIP	Intellectual property firm specialising in digital and computer-implemented technology
Tom Woodhouse	Page White & Farrer	
Christopher Wyatt	IC Resources	IC Resources is the recognised technology recruitment partner to the global tech community.
Yannan Xing	University of Strathclyde	Centre for Signal and Image Processing, Department of Electronic and Electrical Engineering
Dong-Ling Xu	The University of Manchester	Education and Research
Jian-Bo Yang	The University of Manchester	Education and Research
Jun Yao	Huawei Technologies Co Ltd	Huawei is a leading telecommunication company and now is also expanding to cloud, consumer areas.
George Ye	UBIPOS UK LTD	A world leading geospatial science R&D company in GeoSHM, Smart Cities and Precision Agriculture
Steve Young	University of Cambridge	Speaker
Paul Young	ScaleUp Group	
Mohsen Zadeh-Koochak	Analysis Master	Aims to use machine learning techniques to develop automated algorithms for speculative markets
Aaron Zhao	University of Cambridge	
Suzan Ziobro	Graveley Associates	New market development and customer engagement