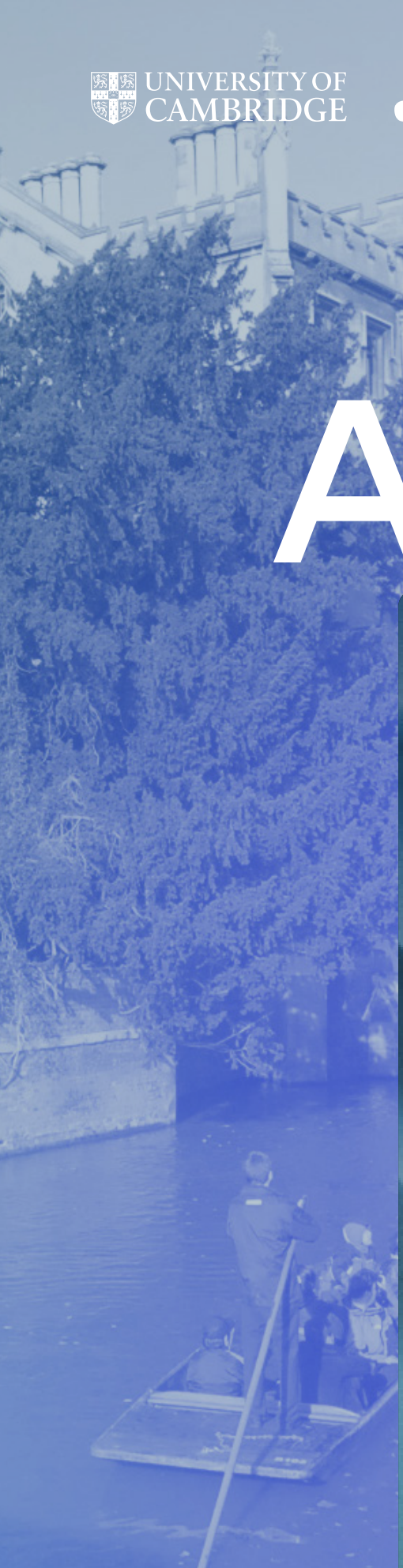
UNIVERSITY OF CAMBRIDGE

ai@cam



# Annual Report

# 2023–24

# Contents

/01
**Summary**
Page 04 - 09

/02
**Introduction**
Page 10 - 15

/03
**Progress against strategic objectives**
Page 16 - 29

/04
**Looking Ahead**
Page 30 - 35

/05
**2024-25 planning**
Page 36 - 43

/06
**Annex 1: Steering group membership**
Page 44 - 47

Section 1

# Summary





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ai@cam is the University of Cambridge's mission to create AI innovations that serve science, citizens, and society.

# AI innovations that serve science, citizens, and society.

2022's ai@cam review identified five core functions needed to deliver Cambridge's vision of AI that serves science, citizens, and society: a dynamic research community; partnerships that centre societal needs; spaces that help projects to spin up and respond to areas of need; wider access to AI knowledge and skills; and connections to local, national, and international priorities for AI. These areas of need have been central to ai@cam's first year of activities:

- **Our AI-deas initiative launched five ambitious research programmes that bring together researchers from 19 Departments across all 6 Schools using AI to to tackle critical challenges in mental health, fertility, public services, language equity, and nature and climate.**

- **Our Policy Lab has catalysed collaborations across five University research centres, connecting the University's expertise in AI, policy, and public dialogue to the challenges faced by policymakers locally, in Westminster and Whitehall, and internationally.**

- **Responding to an opportunity presented by Research Computing Services's new High Performance Computing (HPC) system, our HPC Pioneer Project scheme has helped 46 research projects from 20 Departments get off the ground with access to the University's world-leading compute resource and support from dedicated machine learning engineers.**

- **ai@cam has also played an enabling role, supporting the AI community to respond to external opportunities, such as UKRI funding schemes, providing support for large-scale funding bids, and developing philanthropic and industry partnerships.**

These initiatives are rooted in both community need and public interest. They are shaped by over 400 engagements with researchers, policymakers, partner organisations, and the public across 2023-24, and have been guided by our cross-institutional Steering Group.

Engagement with early career researchers has been a strong feature of our first year. Out of 73 expressions of interest in our AI-deas call for projects, 41 came from early career staff, and 26 (of 46) of our HPC pioneers are PhD students. Feedback from these engagements suggests that our approach to convening the community has helped researchers find new collaborators and unlock access to resources.

Collaborations with University of Cambridge Development and Alumni Relations (CUDAR) and the Strategic Partnerships Office are building connections with stakeholders in industry and philanthropy to help scale our activities and our next year of operations will bring further work in this area.

> "Our first year of operations has established ai@cam as an incubator for interdisciplinary AI that addresses real-world needs.

**100+**
Number of people consulted to create Cambridge's AI vision

**46**
46 research projects from 20 Departments across 6 Schools onboarded to the Dawn system.

**400+**
Number of participants in workshops and events

**Breadth and diversity of engagement in the AI-deas scheme:**

**73**
73 applications from 27 Departments

**£750k**
Resulting in **5 funded challenges**, with a total value of £750k

**19**
Working across 19 Departments spread over all 6 Schools.

**£190k+**
External income generated

**£100M+**
Applications pending or in development.

# ai@cam's vision for a world-class AI research resource

ai@cam offers a mechanism for the University to be a global force in AI research, a world-leader in education, and an engine for innovation that delivers social benefit. By investing in core research capabilities and creating collaborations that drive progress in areas of scientific and social concern, the University can build a world-class AI research resource.

This vision is built on three pillars of activity:

- Growing our research capability: cluster hiring of new faculty, machine learning engineers, and PhD students can create a critical mass of expertise in AI technologies and their safe and effective use.
- Building a core of activity around world-class compute: new HPC systems offer an opportunity to convene core AI teams around world-leading research facilities.
- Creating connections for impact: interdisciplinary engagements with policy, industry, civil society, and the public offer opportunities for creating new challenge-led research programmes and enhancing the impact of existing activities.

By building these pillars, Cambridge can ensure it has the talent, connections, and collaborative culture to scale its research and education activities, leading a new wave of AI innovation. This will continue to be a priority for the ai@cam mission in the coming years.

Section 2

# Introduction

> Supporting the next generation of AI innovation is central to ai@cam's vision, and has been a major focus of our first year's work. Our AI-deas initiative is providing funding and expertise for innovative projects to respond to critical areas of need, delivering AI that serves society.



"Cambridge has an ambitious vision for AI that serves science, citizens, and society.

# Introduction from the chair

Society faces deeply complex challenges, from economic growth to population health, to climate change. The potential of AI to help tackle these challenges is clear, but technology, policy, and practice in this fast-moving domain are not yet positioned to realise this promise. Achieving positive societal impact with AI requires interdisciplinary research that is deeply connected to real-world needs. Universities have a crucial role to play as an incubator for this interdisciplinary innovation.

In a year that has brought rapid progress in AI technologies and a new wave of public debate about their implications, we've been delighted to launch ai@cam as a new mission to deliver the University's vision for AI that serves science, citizens, and society. Leveraging world-leading research from across the University, ai@cam will create connections between disciplines, sectors, and communities to unlock a new wave of progress in AI for the benefit of science, citizens, and society.

Supporting the next generation of AI innovation is central to ai@cam's vision, and has been a major focus of our first year's work. Our AI-deas initiative is providing funding and expertise for innovative projects to respond to critical areas of need, delivering AI that serves society. The first AI-deas funding awards are supporting five ambitious projects using AI to tackle challenges spanning fertility, climate change, mental health, language equity, and public services delivery. These projects were selected following a process that was both highly competitive and designed to catalyse new cross-University collaborations. The resulting challenges are interdisciplinary by design – the five challenges engage 19 Departments across 6 Schools – and rooted in public purpose. It has been fantastic to see the University community rally behind our first flagship initiative, and particularly exciting to see how this approach has caught the imagination of Cambridge's early career researchers.

At a time when technology change has brought serious questions about the risks of AI to public conversations about its future, bridging the gap between research and policy is more important than ever. ai@cam's Policy Lab is helping connect the research advances coming from labs across Cambridge to the issues of concern to members of the public and policymakers. We launched this initiative in the heat of discussions around the UK Government's AI Safety Summit in 2023, with partnerships that connect across the Bennett Institute, Kavli Centre for Ethics, Science, and the Public, Minderoo Centre for Technology and Democracy, and Cambridge Centre for Science and Policy. This collaboration has allowed us to convene diverse conversations about AI with the public and policymakers, from a double-decker bus on Parker's Piece to the Palace of Westminster. We look forward to scaling this initiative in 2024.

Our 2022 AI review started a conversation within Cambridge about how the University can work as a team to build our AI capabilities. We've been delighted to be joined by a brilliant cross-University Steering Group to take forward our work, and look forward to being able to onboard our core staff team soon. Working with CUDAR, the Strategic Partnerships Office, Innovate Cambridge, Research Computing Services, Centre for Data Driven Discovery, and University senior leadership team to find ways to enhance the Cambridge AI community has been a priority in year one of our work. These collaborations are bridging between the research community and infrastructural support, for example with 46 Pioneer Projects gaining access to the University's new Dawn supercomputer. We hope these coalitions will lay the foundations for wider impact for ai@cam in the longer-term. Cambridge has an exciting vision for a unique AI research resource, and we look forward to driving progress towards this vision.

The ai@cam review identified five core functions needed to deliver the University's AI ambitions. Our first annual report, presented here, introduces some of the highlights from our first year of building these functions. In the longer-term, we believe ai@cam offers a mechanism for the University to build a strategic AI research resource, through investment in research capability, infrastructure, and interdisciplinary collaborations. This is an ambitious vision, but one that is firmly rooted in both the aspirations of the University community and the University's public purpose. We look forward to continuing to work with the University to shape the ai@cam mission in the coming years.

N. Lawrence

**Neil Lawrence,**
**Chair, ai@cam**

J. Montgomery

**Jessica Montgomery,**
**Director, ai@cam**

# Key Highlights:

**DEC, 2022**

Convened a sandpit to support researchers across Departments to respond to the UKRI AI Hub bid call and contributed to the University AI CDT bid review process.

**JAN, 2023**

Established a cross-University Steering Group to guide the development of the ai@cam mission.

**FEB, 2023**

Workshopped ideas to support cross-University teaching and learning activities in AI.

**MAR, 2023**

Delivered the AI Council's briefing paper on foundation models to DSIT. [1]

**APR, 2023**

Convened first Steering Group meeting to consider flagship initiatives.

**MAY, 2023**

Contributed to workshops on foundation models with Government Office for Science, European Commission, and Competition and Markets Authority.

**JUN, 2023**

Explored ways of working to deliver interdisciplinary AI at scale at a workshop with Professional Services Staff.

**JUL, 2023**

Launched AI-deas as a flagship initiative to build challenge-led, interdisciplinary research programmes.

**SEPT, 2023**

Contributed evidence to the House of Lords Digital Committee. [2]

**OCT, 2023**

Co-published the Bennett Institute and Minderoo Centre for Technology and Democracy's policy brief on generative AI. [4]

**NOV, 2023**

Convened public dialogues to explore hopes and fears for AI and supported the People's Panel on AI that reported into AI Summit Fringe programme. [3]

**DEC, 2023**

Launched a HPC Pioneer Project scheme to facilitate researcher access to the new Dawn facility.

**JAN, 2024**

Led discussions about open source innovation at the AI House in Davos. [5]

**FEB, 2024**

Awarded 5 ambitious AI-deas challenges approx. £150k each to develop their work.

**MAR, 2024**

Brought 46 HPC Pioneer Projects to the Dawn system, with onboarding activities including software engineering support and a training hackathon.

> Our annual report, presented here, introduces some of the highlights from our first year. We look forward to continuing to work with the University to shape the ai@cam mission in the coming years.

1. https://mlatcl.github.io/publications/large-language-model-opportunity.html and https://mlatcl.github.io/publications/ai-council-foundation-models-policy-paper.html
2. https://committees.parliament.uk/event/19126/formal-meeting-oral-evidence-session/
3. https://connectedbydata.org/projects/2023-peoples-panel-on-ai
4. https://www.mctd.ac.uk/which-path-should-the-uk-take-to-build-national-capability-for-generative-ai/
5. https://www.aihousedavos.com/program and https://www.youtube.com/watch?v=7_YULkhecm4

Section 3

# Progress against strategic objectives

# 1 Nurture a dynamic interdisciplinary research community

Interdisciplinary research is vital to bridge technological innovation to public value. The University is already home to an active community of researchers who are passionate about delivering public benefit through the development and use of AI. There is a strategic opportunity to develop this community. In response, ai@cam is providing an interdisciplinary research incubator that creates connections across the University, links researchers with infrastructural support, and helps scale promising initiatives.

In Summer 2023, we launched our first initiative – AI-deas – to provide funding and expertise for innovative projects tackling issues of pressing concern to science and society. This initiative will provide funding, connections, and support that will help researchers take their ideas from innovation to application. By championing projects with real-world applications, AI-deas aims to convene multidisciplinary AI research teams that help create a sustainable, inclusive society. There is an opportunity in its next phase of development for AI-deas to extend this interdisciplinary AI incubator to fundamental research.

AI-deas has brought together experts from across the University, engaging a broad spectrum of perspectives and knowledge in the design of ambitious research agendas. Our initial call for input received 73 project proposals from 27 Departments that engaged all 6 Schools. A cross-University workshop in November 2023 translated these proposals to challenge-led programme pitches, catalysing new connections between researchers to produce challenges that are interdisciplinary by design and rooted in public purpose.

Five AI-deas were selected for funding in 2024 (Boxes 1-5). These challenges draw in expertise from 19 Departments, and researchers varying in seniority from PhD students to professors. Early career researcher engagement with the scheme has been strong, and it is clear that AI-deas offers a mechanism to nurture the next generation of AI pioneers within the University. AI-deas has also provided a vehicle to engage the University's strategic research communities, helping supercharge their work. The AI for Climate and Nature challenge, for example, offers a route to bridge between the University's flagship missions in AI and climate change, while also engaging climate- and biodiversity-related initiatives across Departments. Launch of the funded projects in Spring 2024 attracted media coverage from Research Fortnight and POLITICO, which introduced the challenge areas themselves and positioned Cambridge as a thought-leader in delivering innovation for public benefit.

Alongside its work with the AI-deas projects, ai@cam has provided support for a range of large-scale funding bids from researchers across the University. This has included convening to help develop collaborative funding bids and letters of support for major funding proposals. In the coming year, we will also consider how we can build on the community energy behind AI-deas and help progress a range of projects connected to the scheme.

▲ **AI-deas: Challenge development workshop**

Early 2024 also brought the launch of our HPC Pioneer Project scheme. The new Dawn system, being developed by a partnership between the University of Cambridge, Dell, Intel, and StackHPC, offers the opportunity to accelerate AI research in the University. With the aim of ensuring researchers across the community can capitalise on the benefits Dawn offers, ai@cam convened the HPC Pioneer Project Scheme to help design interfaces and working processes that enhance the accessibility of the system to communities across the University.

A joint call from ai@cam, Research Computing Services, the Cambridge Open Zettascale Lab, the Cambridge Centre for Data Driven Discovery, and the Institute of Computing for Climate Science offered pioneer projects early access to Dawn and support using the new system. It received 46 applications from 20 departments, which are being onboarded across March and April. Working with this cohort of pioneer projects will help tailor Dawn's operations to the needs of the AI and simulation communities. For example, lessons from these interactions will feed into the design of support services built around the new compute facility. Bridging between research and infrastructure in this way can help the University build a world-class compute environment for AI research.

This collaboration has also resulted in a major funding bid submitted in February 2024.

[BOX 01]

## Responsible AI for better lifelong brain and mental health

Brain diseases and mental health disorders are taking a toll on people throughout their lives. Dementia is the leading cause of death in England and Wales, and different mental health disorders lead to significant reductions in life expectancy.

This project will use the latest advances in AI to better understand brain health and disease. It will explore the environmental, social and neurological factors at play, to develop responsible AI-driven tools that help clinicians predict, diagnose and treat brain diseases and mental health disorders.

"AI-deas is a springboard for thinking outside the box about using AI to tackle real-world challenges like those associated with brain and mental health disorders. Brain and mental health disorders touch every family. Building robust and responsible AI tools has the potential to help clinicians diagnose early, improve patient wellbeing and outcomes and reduce misdiagnosis, making resources available to people that need them the most."

— Professor Zoe Kourtzi, AI-deas challenge lead

[BOX 02]

## From conception to childhood: Revolutionising women's health, female fertility and early infant neurodevelopment using AI

The UK has the largest gender health gap in the G20 and declining fertility rates, with women's health issues not well understood.

This project aims to develop more affordable, less invasive and more accurate AI-assisted tests that can be used throughout the conception to childhood journey. These tests will be used to enhance and personalise fertility outcomes, and support the transition to parenting. This research will play a key part in improving fertility and women's health outcomes and shed light on the still largely unknown cellular, molecular and genetic mechanisms governing the development of life.

Dr Staci Weiss, AI-deas challenge co-lead said: "AI-deas provides an interdisciplinary platform bringing together data and new AI analytic approaches to

accelerate identification of reproductive health biomarkers from embryo through to neonate."

Mo Vali, AI-deas challenge co-lead said: "We will seek to revolutionise reproductive health technology using state-of-the-art AI methods, leveraging Cambridge's long tradition of research in this field. Translating our research from lab to clinic by developing rigorous tests to improve clinical outcomes will benefit the wider public and help to ease the NHS burden."

[BOX 03]

## Improving language equity and inclusion through AI

Using language to communicate is something many take for granted. However, a significant proportion of the UK population find spoken or written communication more difficult due to sensory, neural or linguistic challenges such as hearing loss, brain injury or language barriers, and can face substantial disadvantages in many aspects of their lives.

This project aims to develop new AI methods to understand and address these challenges to improve equity and inclusion. It will develop new ways to support people with language and communication difficulties. For example, with AI we can assess and diagnose common language and communication conditions at scale, and develop technologies such as intelligent hearing aids, real-time machine translation, or other language aids to support affected individuals at home, work or school.

Matt Davis, AI-deas challenge lead, said: "New AI technologies are changing our day-to-day lives: we speak rather than type text messages on our phones, and have conversations with Alexa or Siri. As these systems become more common they may reinforce the barriers faced by those who find communicating through language more difficult. Cambridge University hosts the UK's largest community of researchers working on speech and language technology and have a remarkable breadth and depth of expertise in understanding the real-world impact of language challenges in education, health or work. This project brings these research communities together to develop new AI technologies to support people who find communicating using language a daily challenge in order to improve equity and inclusion."

[BOX 04]

## Decision-making with AI in connected places and cities: Developing an ethical and responsible innovation rooted approach for public value creation

Public sector use of AI is growing, with some local authorities in England already using Large Language Models and predictive analytics to make city-scale decisions. It is important that the use of AI to make decisions is ethical and leads to the desired outcomes.

This project aims to investigate how local authorities in England are using AI to make decisions about issues such as placemaking, land use and mobility, and sustainable water supply systems to create public value. The project will develop resources for local authorities to make ethical and informed choices and the use of AI as part of digitalisation initiatives.

Dr Kwadwo Oti-Sarpong, AI-deas challenge lead, said: "We're excited to be one of the winners of AI-deas and work on this project with practitioners across disciplines to shape the future of public sector decision-making using AI in creating connected places. Understanding how to practically root AI use in ethical considerations, and showing how that can be done, will significantly change how we create the future we want."

[BOX 05]

## AI for climate and nature

The twin climate and biodiversity crises are two of the world's most complex challenges to tackle. This project aims to develop AI approaches for bringing together a wide range of datasets and accelerating the collation of information.

This work will provide up to date, relevant and robust information for researchers and decision-makers working on climate and biodiversity conservation – opening up the possibility for more targeted and effective solutions to some of our world's most pressing climate and biodiversity challenges.

This project is a collaboration between Cambridge Zero, Cambridge Conservation Initiative, Conservation Evidence, Institute for Computing for Climate Science, Conservation Research Institute, Centre for Landscape Regeneration, Cambridge Centre for Carbon Credits and Cambridge Centre for Earth Observation.

Anil Madhavapeddy, AI-deas challenge co-lead, said: "Mitigating the impacts of climate change while maintaining and restoring biodiversity demands urgent, evidence-based action. We're excited to bring together an interdisciplinary team across computer science, ecology, climate and conservation to use AI to empower decision-makers to equitably tackle the biggest challenge of our generation."







## 2 Build partnerships and collaborations that centre societal interests and ethics in AI

ai@cam embraces a spirit of openness and collaboration. We want to bring a diversity of perspectives to bear on the development of AI, prioritising the involvement of communities affected by AI, and partnering across academia, policy, civil society, and industry to deliver our vision.

Alongside the internal collaborations nurtured by the AI-deas initiative, a partnership between ai@cam and the Kavli Centre for Ethics, Science, and the Public has been exploring how the University can centre public voices in AI research. In October and November 2023, ai@cam supported two Hopes and Fears Labs – a flagship programme from the Kavli Centre that convenes open dialogue between researchers and the public on critical areas of science – focused on AI. Across the two days, at sites in Cambridge and London, over 100 members of the public joined conversations with Cambridge University researchers on topics spanning health, environment, arts and culture, and policy. This collaboration also supported a Citizen's Panel on AI, led by the charity Connected by Data, which invited participants from across the UK to deliberate on current issues in AI policy and develop recommendations to enhance its democratic governance.

Amidst heated debate about the risks associated with frontier AI systems, a collaboration between ai@cam, the Bennett Institute for Public Policy, and the Minderoo Centre for Technology and Democracy set out to connect Cambridge expertise to policy conversations. Published ahead of the International AI Safety Summit, a policy brief considered what national capability the UK needs to develop and deploy responsible frontier AI systems. This briefing was covered by The Times and POLITICO, alongside specialist publications such as The Next Web, The Information Age, Open Access Government, and the Innovation News Network. Alongside this publication, a series of six ai@cam blog posts from different disciplinary perspectives explored the risks and opportunities of AI, and the actions needed in response.

> "We want to bring a diversity of perspectives to bear on the development of AI

6. For video summaries of these sessions, see: https://www.kcesp.ac.uk/hopes-and-fears-lab-ai-edition-videos/
7. https://ai.cam.ac.uk/news/2023-11-01-cambridge-perspectives-genai-governance

## 3

## Create spaces for innovative projects to spin up and respond to areas of need

The HPC Pioneer Project scheme is one example of the enabling role that ai@cam is playing across the University. By connecting across the community of researchers and centres with an interest in AI, ai@cam is helping the University respond to areas of need locally and nationally. Other examples of such enabling activities in year one have included:

- Supporting the School of Technology Postgraduate Education team to review and shortlist bids for funding to create Centres for Doctoral Training;
- Convening 35 researchers with an interest in UKRI's funding call for AI hubs to network and develop their ideas for bids;
- Working with the Strategic Partnerships Office to provide a point of contact for industrial collaborators to develop strategic partnerships with the University.
- Developing relationships with international collaborators, with the University International Team.
- Advising Innovate Cambridge on how to develop its approach to AI.

By providing a hub that connects research, business, civil society, and policy, ai@cam will support the deployment of AI for wider societal and economic benefit. To achieve its ambition of being a hub for responsible AI innovation, the University needs spaces to bring together collaborators from different domains in an environment that encourages knowledge exchange and connects to society's needs. The extent to which traditional innovation spaces are useful in AI is an open question. In its next phase of development, ai@cam will explore how new physical spaces can help connect AI innovation to societal benefit, through mechanisms that combine elements of start-up support; responsible innovation; public dialogue; and business engagement.


▲ Hopes & Fears Event

> By providing a hub that connects research, business, civil society, and policy, ai@cam will support the deployment of AI for wider societal and economic benefit.

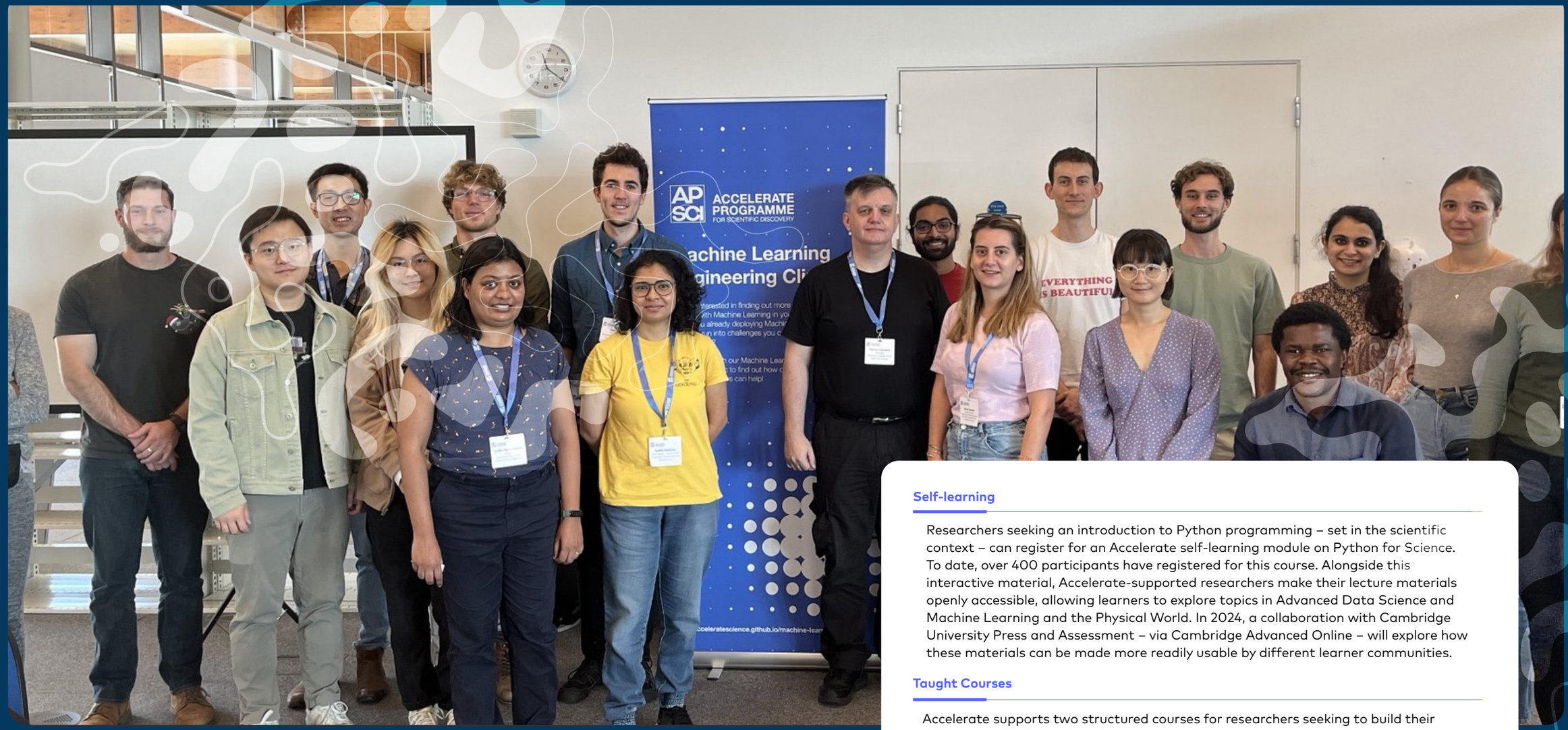
## 4

## Widen access to AI knowledge and skills across and outside the University

The University aspires to be an innovator in AI education, creating learning programmes that advance AI technologies, that embed AI knowledge across disciplines, and that support the next generation of AI leaders in research, business, policy and society. Both within and outside the University, diverse communities of learners could benefit from wider access to AI knowledge. Delivering these aspirations will require a step-change in access to AI training and education.

To explore how the University can develop its teaching offer to support these outcomes, in Spring 2023 ai@cam convened a cross-University workshop on AI teaching and learning. This workshop identified the need for an infrastructure for AI teaching and training that can accommodate the needs of diverse learner groups. Such an infrastructure would allow learners to understand what learning materials would suit their needs, access those materials through taught courses and self-study, and apply the results of their learning in practice. Discussions generated ideas for flexible re-use of teaching material, open access repositories, and workshops and study groups to expand access to AI knowledge. While ai@cam recruits a core team that can help develop these ideas, some have already been trialed under the auspices of the Accelerate Programme for Scientific Discovery (see Next Page).

Underpinning these discussions about teaching and learning is a strategic question about capability building in core AI domains. In June 2023, guided by discussions at its Steering Group, ai@cam convened a cross-institution group of Professional Service Staff to explore organisational interventions to support such capability building.




# The Accelerate Programme for Scientific Discovery

The Accelerate Programme for Scientific Discovery, led by Neil Lawrence and Jessica Montgomery and funded by Schmidt Futures, is an approx. £7M cross-University initiative equipping future research leaders with the AI skills to drive a new wave of scientific progress. ai@cam is leveraging synergies with this initiative to develop its approach to teaching and training. Since its creation in 2020, Accelerate has trained over 400 researchers in data science and AI through its taught courses and workshops, and its community building activities have reached over 800 participants.

Accelerate's aim is to create a pipeline of activities that allow researchers to progress from learning basic coding skills to deploying advanced AI methods. The team currently deliver five types of learning support **[see opposite panel]**.

The Accelerate Programme will run to March 2026. Community-building is central to its continuing impact over the long-term, and current activities are being designed to encourage peer mentoring and community support. There are also opportunities to embed this work in the University's vision for its AI research resource (set out later in this document).

### Self-learning

Researchers seeking an introduction to Python programming – set in the scientific context – can register for an Accelerate self-learning module on Python for Science. To date, over 400 participants have registered for this course. Alongside this interactive material, Accelerate-supported researchers make their lecture materials openly accessible, allowing learners to explore topics in Advanced Data Science and Machine Learning and the Physical World. In 2024, a collaboration with Cambridge University Press and Assessment – via Cambridge Advanced Online – will explore how these materials can be made more readily usable by different learner communities.

### Taught Courses

Accelerate supports two structured courses for researchers seeking to build their data science and AI skills. A five-week Data Science for Science Residency equips participants with core skills in data science, while a one-year Machine Learning Academy introduces more advanced AI methods. Both are convened in partnership with Cambridge Spark.

### Training Workshops

Alongside these courses, Accelerate delivers one-day training workshops that provide practical support in using AI techniques. These focus on: Large Language Models; Software Engineering Best Practices; Data Pipelines; and Diffusion Models.

### Engineering Support

Accelerate's AI Clinic offers tailored support for researchers as they implement AI in their science. Researchers can submit a request for support, which is responded to by Accelerate's machine learning engineers.

### Peer Mentoring

Community-building activities – including events, networking sessions, and workshops – help scale the impact of Accelerate-driven courses through peer mentoring and support.

# 5 Connect Cambridge expertise to national AI priorities

At a time of heightened public interest in AI, access to trustworthy information and insights to inform policy debates is more important than ever. The University can offer policymakers access to a wealth of expertise and the opportunity to trial new ideas. ai@cam's Policy Lab provides a forum to connect stakeholders from research, public, private, and philanthropic sectors to enable such evidence-based, informed policymaking.

Our first Policy Lab activities connected to the UK Government's AI Safety Summit in Autumn 2023, resulting in a policy brief on Generative AI in collaboration with the Bennett Institute and Minderoo Centre for Technology and Democracy. Across 2023 and 2024, ai@cam has convened a range of policy engagement activities that continue the conversation about how to bridge from technology development to public value.

## These include

ai@cam has also established an international presence, through a collaboration with strategic partners in Switzerland. A series of workshops with the Swiss Federal Department of Foreign Affairs and ETH Zurich resulted in an ai@cam-convened panel on AI governance at the AI House in Davos in January 2024, alongside the launch of the International Compute and AI Network.

By working closely with policymakers, ai@cam will facilitate the development of informed, practical policies for AI, ensuring that these powerful technologies connect to public benefit. For example, workshops with the Centre for Science and Policy in Spring-Summer 2024 will convene on topics including life sciences and education.

A workstrand on communications, in collaboration with the central communications team, has enabled this work. ai@cam has created a new communications strategy, and looks forward to being joined by a Communications and Engagement Manager to deliver this strategy in the coming months.

### 2 roundtables

Two roundtables with Peter Kyle MP, Shadow Secretary of State for Science, Innovation and Technology, which explored AI governance and the role of AI in research and innovation.

### 3 local councils

A roundtable with three local councils, which developed connections between their AI strategies and local innovation activities.

### 2 evidence sessions

2 contributions to the House of Lords Digital Committee, helping inform their inquiry into Large Language Models.

### 6 Government bodies

1:1 meetings with the Department for Science, Innovation, and Technology, Cabinet Office, the AI Safety Institute, the Department for Education, the Department for Business and Trade, and the Committee for Standards in Public Life.


▲ **Panel discussion on open source technology and AI safety at the AI House in Davos, January 2024**

▼ **Professor Neil Lawrence speaking to the House of Lords Communications and Digital Committee, September 2023**

**Our collaborators**

- Accelerate Programme for Scientific Discovery
- Addenbrooke's Hospital
- AI4ER CDT
- Bennett Institute for Public Policy
- Cambridge Centre for Data Driven Discovery
- Cambridge Centre for Earth Observation
- Cambridge Centre for Science and Policy
- Cambridge Conservation Initiative
- Cambridge University Development and Alumni Relations Office
- Cambridge Zero
- Centre for Carbon Credits
- Centre for Landscape Regeneration
- Communications team
- Connected by Data
- Conservation Research Institute
- Department of Applied Mathematics and Theoretical Physics
- Department of Architecture
- Department of Computer Science and Technology
- Department of Engineering
- Department of Geography
- Department of Land Economy
- Department of Physics
- Department of Physiology, Development and Neuroscience
- Department of Plant Sciences
- Department of Psychiatry
- Department of Psychology
- Department of Zoology
- Department of Zoology
- ETH Zurich Innovate Cambridge
- Faculty of Education
- Faculty of Modern and Medieval Languages and Linguistics
- Innovate Cambridge
- Institute for Computing for Climate Science
- Institute of Continuing Education
- Kavli Centre for Ethics, Science, and the Public
- Leverhulme Centre for the Future of Intelligence
- Minderoo Centre for Technology and Democracy
- MRC Cognition and Brain Sciences Unit
- Open Zettascale Lab
- Research Computing Services
- Strategic Partnerships Office
- Swiss Federal Department of Foreign Affairs
- The Lister Hospital, HCA
- University Information Services

Section 4

# Looking Ahead



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The University of Cambridge aspires to be a global force in AI research, a world-leader in education, and an engine for innovation that delivers social benefit.

# A vision for AI at Cambridge

The community engagement that led to the creation of ai@cam articulated a vision for AI at the University. In this vision, the University is both the heart of a vibrant local AI innovation ecosystem and a strategic AI research resource with national and international influence. It is a global force in AI research, a world-leader in education, and an engine for innovation that delivers social benefit. ai@cam provides a mechanism to realise these aspirations.

Inspired by our consultation with Cambridge's AI community, we envisage a world-class AI research resource built on three pillars of activity:

**Capability:** A critical mass of expertise in AI technologies - and their safe and effective use - through significant investment in new faculty, machine learning engineers, and funding for PhD students.

**Compute:** Cutting-edge compute resources that allow researchers to rapidly train, test, and deploy AI tools, with support to ensure these innovations are developed safely and responsibly.

**Challenges:** A step-change in interdisciplinary collaboration that identifies and responds to real-world challenges in science, policy, industry, and civil society, facilitated by a shared space that provides a focal point for AI activities across the University.

In the near-term, ai@cam is building a foundation for AI that serves science, citizens, and society. Our AI-deas, Policy Lab, Accelerate Science training, and industry engagement activities are catalysing interdisciplinary collaboration and challenge-led research. Our work with Research Computing Services and collaborators on the HPC Pioneer Project Scheme and Dawn 2 compute funding bid are helping develop a world-class compute facility. Early discussions with the Department of Computer Science and Department of Engineering are exploring the creation of a shared office for core technical teams, from where we can scale collaborative activities.

In the longer-term, delivering this vision will require transformational funding.

- Cluster hiring in interdisciplinary AI would allow the University to rapidly scale its AI capabilities across departments through recruitment of new faculty and PhD students.
- Investments in a shared collaborative space could unlock new interdisciplinary innovations within and outside the University.
- Resources to facilitate engagement with policy, industry, and civil society could generate partnerships that identify new directions for challenge-led research.

Each of these contributes to an enabling environment in which Cambridge has the talent, connections, and collaborative culture to scale its research and education activities. ai@cam and CUDAR are creating a proposal that will set out this vision. This will continue to be a priority for the ai@cam mission in the coming years.

# ai@cam's approach

**We aim to be outward-facing, inclusive, and innovative in our approach to developing the ai@cam mission.**

In support of these goals, the following tenets currently shape our work:

One

We prioritise real-world challenges and societal benefit.

Two

We centre interdisciplinarity in our work.

Three

We collaborate for scale and impact.

Four

We seek new ways of working and innovative solutions.

Five

We seek to raise all boats, bringing benefits across the Cambridge community.

As our work progresses, we'll continue to review these tenets.

Section 5

# 2024-2025

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The next year will see ai@cam launch further flagship initiatives, develop its portfolio of foundational activities, and scope future initiatives in response to community needs.

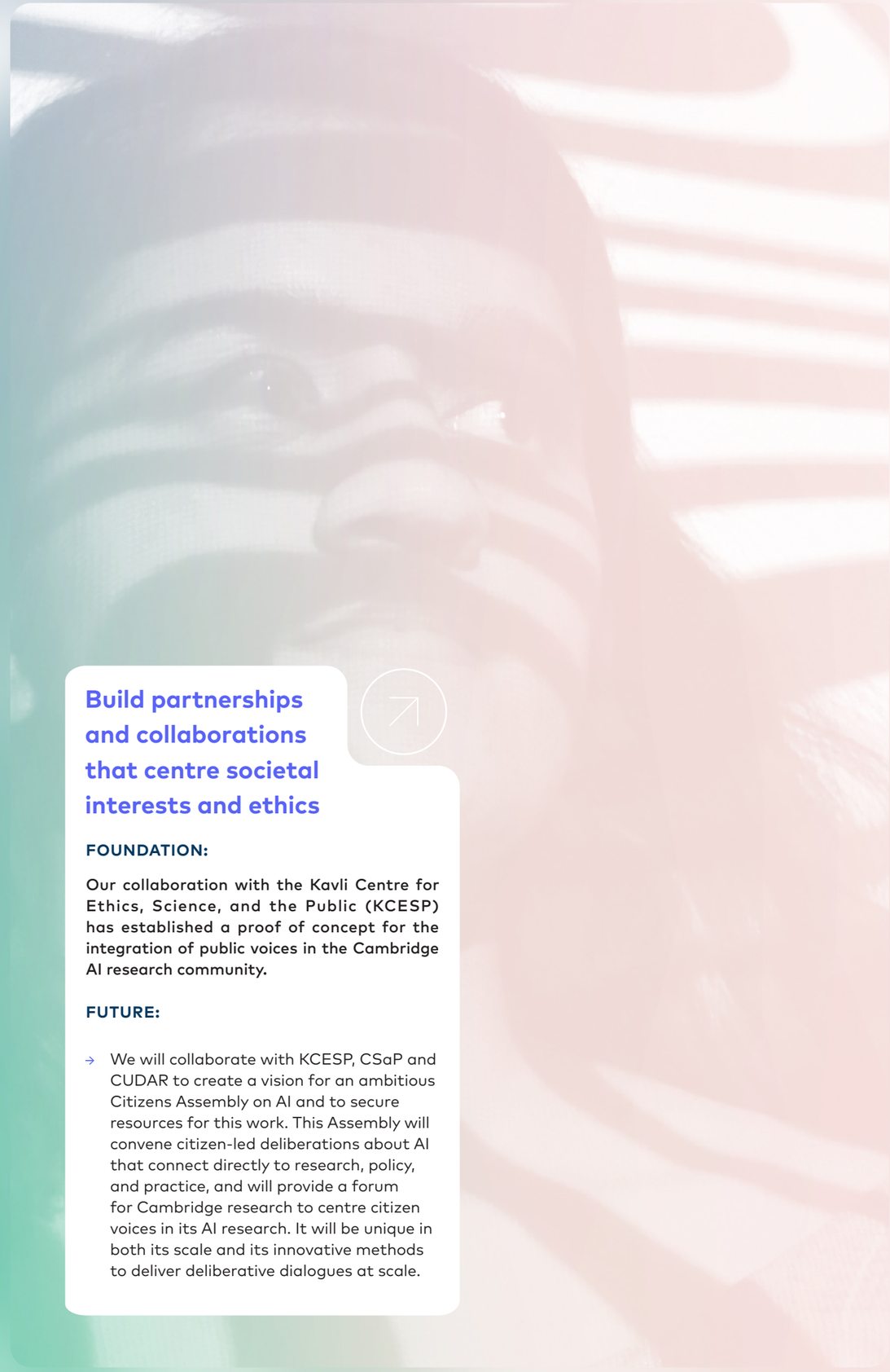
## Nurture a dynamic interdisciplinary research community

**FOUNDATION:**

**Our AI-deas initiative has energised communities across the University, and is supporting five challenge-led research programmes.**

**FUTURE:**

- Building on this successful first phase of implementation, in the next year ai@cam will establish its interdisciplinary research incubator that supports the first cohort of AI-deas to move from idea to implementation. This incubator will facilitate networking and mentorship, support partnership development, enhance internal and external communications, and provide high-quality technical support. Challenge teams will be able to scale their work and begin to translate their ideas to wider impact.
- Alongside supporting the five challenges funded by AI-deas, we will work with the large pool of applicants to the AI-deas scheme to develop activities that help build this community.
- If the University's 2024 HPC funding bid is successful, we will support an expansion of the HPC Pioneer Project activities, and work with the Research Computing Services team to deliver a world-class AI computing research resource.
- In the longer-term, there are opportunities to expand this work through cluster hiring. We will work with CUDAR to progress a proposal for transformational investment in AI at the University.



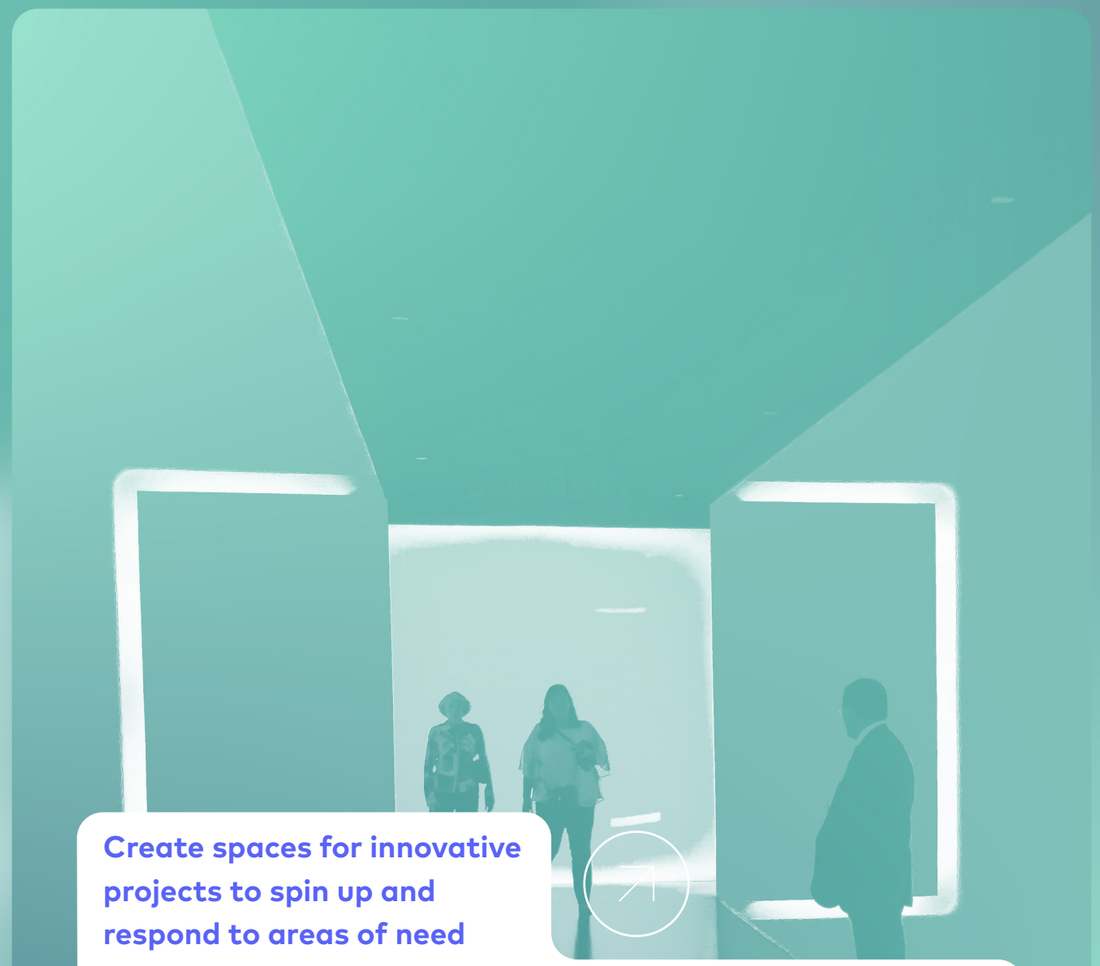
## Build partnerships and collaborations that centre societal interests and ethics

**FOUNDATION:**

**Our collaboration with the Kavli Centre for Ethics, Science, and the Public (KCESP) has established a proof of concept for the integration of public voices in the Cambridge AI research community.**

**FUTURE:**

- We will collaborate with KCESP, CSaP and CUDAR to create a vision for an ambitious Citizens Assembly on AI and to secure resources for this work. This Assembly will convene citizen-led deliberations about AI that connect directly to research, policy, and practice, and will provide a forum for Cambridge research to centre citizen voices in its AI research. It will be unique in both its scale and its innovative methods to deliver deliberative dialogues at scale.



## Create spaces for innovative projects to spin up and respond to areas of need

**FOUNDATION:**

**ai@cam has already supported teams across the University to take advantage of funding opportunities, potential collaborations, and new research resources. While continuing to deliver these functions in 'responsive mode' - for example, convening in response to large-scale funding opportunities - in the next year we will scale activities to deliver the 2022 ai@cam review vision of a hub for innovation.**

**FUTURE:**

- Our innovation initiative (working name: sciencepreneurship at Cambridge) will support researchers and external partners to experiment, prototype, and pilot AI innovations that respond to societal needs. In the near-term, this scheme will build bridges between researchers, entrepreneurs, and the local innovation ecosystem through workshops and training sessions that support students and researchers to build and scale their ideas.
- Lessons from this work - and from an in-depth review of the needs of the AI community - will be used to take forward the vision proposed in the 2022 review of a new space that facilitates connections between AI researchers and experimentalists. This space is integrated into our long-term vision for AI at the University.
- We will advance partnership discussions with potential strategic partners.

## Widen access to AI knowledge and skills

**FOUNDATION:**

**Consultations in our first year of operation have identified scalability as a core challenge in enabling wider access to AI teaching and learning activities across the University. Initiatives in year two will experiment with mechanisms to enable a wider range of students and staff to access relevant resources.**

**FUTURE:**

- A collaboration with Cambridge University Press and Assessment will pilot shareable teaching materials on core concepts in machine learning. Next steps in this collaboration will be confirmed after a feasibility study.
- We will leverage synergies with the Accelerate Programme for Scientific Discovery to support a pipeline of teaching and learning activities that can support a researcher to progress from learning programming skills, to understanding core concepts in data science and AI, through to deploying foundation models in their research. These activities will include hands-on workshops in using AI, study groups, and self-learning materials in core AI concepts.
- Lessons from these projects will inform the longer-term development of a carpentry-style mechanism for scaling access to AI knowledge and skills across the University.

Alongside these areas for action, ai@cam will continue to build its governance and strategy, including activities to convene its Steering Group, consult with the Cambridge AI community about its future direction, help the community respond to large-scale funding bids, and recruit a core team to drive mission progress.

## Connect to national and international AI priorities

**FOUNDATION:**

**Initial Policy Lab activities have demonstrated our ability to convene Cambridge University expertise in response to national policy priorities. Following a soft-launch of this initiative in autumn 2023, ai@cam will develop a full programme of activities, including workshops with CSaP and engagements with local government partners.**

**FUTURE:**

- The next phase of ai@cam's Policy Lab will position Cambridge for influence in a growing conversation about the use of AI for public services. Starting with a collaboration across local governments in Greater Cambridgeshire, ai@cam will bring together researchers and policymakers to explore potential applications of AI in public services, prototype AI-enabled solutions to public sector challenges, and share lessons learned through community-building and case studies.
- Responsive policy engagement activities will bring Cambridge University researchers together to tackle issues of current concern at the interface of research, innovation, and policy. For example, CSaP workshops in April and May will convene industry leaders in the life sciences and policy leaders in education, respectively, to consider the impact of AI on their sectors. Further such engagements will be scoped in line with political developments in the next year, and delivered through workshops, policy briefs and evidence synthesis, and horizon-scanning activities.
- ai@cam will also support the University's international relationships through collaborations with strategic partners. ai@cam will support the International Team to host a delegation of researchers and policymakers from Germany in June and from Switzerland over the Summer.

Annex 1

# Steering Group Membership

## John Aston

Harding Professor of Statistics in Public Life, Department of Pure Mathematics

## Colm-cille Caulfield

Professor of Environmental and Industrial Fluid Dynamics, Head of the Department of Applied Mathematics and Theoretical Physics, and co-Chair, C2D3

## Diane Coyle

Bennett Professor of Public Policy, Bennett Institute

## Neil Lawrence

Department of Computer Science and Technology

## Tim Minshall

Dr John C Taylor Professor of Innovation, Institute for Manufacturing

## Jessica Montgomery

Director, ai@cam

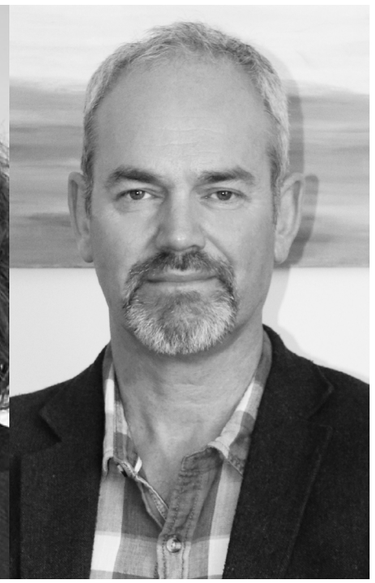
## Mireia Crispin

Assistant Professor, Integrated Cancer Medicine, Department of Oncology

## Anne Ferguson-Smith

Pro-Vice Chancellor (Research and International Partnerships)

## Simon Godsill



Professor of Statistical Signal Processing and Head of Information Engineering, Department of Engineering

## Gina Neff

Executive Director, the Minderoo Centre for Technology & Democracy

## Carola-Bibiane Schönlieb

Professor of Applied Mathematics, Department of Applied Mathematics and Theoretical Physics

# Get in touch

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UNIVERSITY OF CAMBRIDGE

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# Annual Report

# 2023–24