Imperial College London

Digital Health Industry Event
14th and 15th September 2022

Imperial College London
South Kensington Campus

AI Health
https://ai4health.io

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Welcome

The AI4Health Centre extends you a very warm welcome to this year, Digital Health Days on the 14th and 15th September 2022. Our Digital Health Days focus on digital health technologies, medical technology regulation and ways to promote life-long health and well-being in our society through innovation.

We were deeply saddened by the news of the death of Her Majesty Queen Elizabeth II. We have accordingly reflected this in our two-day event which included setting an appropriate tone for the afternoon reception with a focus on human interaction and discussion.

We are grateful for the support extended to us by our partners who helped bring this event to you, the British Heart Foundation Centre of Research Excellence at Imperial College London, and our industry sponsor InterSystems.

Our two-day event comprises:

Industry Day – 14th September 2022

The aim of the industry day is to bring together academics, start-ups, SMEs, and large companies to present on challenges, solutions, and case studies of interesting and innovative systems and applied research in Digital Health.

Regulatory Workshop – 15th September 2022

In this workshop, presentations and panel discussions will explore:

- Evaluation and regulatory approaches, and how they can be developed to allow for safe yet rapid innovation in digital healthcare, especially in the context of AI applications and deployment.
- New technology horizons that require us to consider foresight when considering explainable, safe, trusted, and robust solution.

We hope that you will find these two-days conducive to your interests and aims and give you the opportunity to deepen your connections to this rapidly evolving field.

Professor Aldo Faisal
Director, UKRI Centre for Doctoral Training in AI for Healthcare

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Programme at-a-Glance

Location
Imperial College London
City and Guilds Building – Lecture Theatre 200
South Kensington Campus
Exhibition Road,
London SW7 2AZ

Industry Day – 14 September 2022

10:00 am – 11:00 am	Registration
11:00 am – 11:10 am	Welcome
11:10 am – 12:10 pm	Oral Presentations
12:10 pm – 12:40 pm	**Break**
12:40 pm – 2:00 pm	Oral Presentations
2:00 pm – 3:00 pm	**Lunch**
3:00 pm – 4:00 pm	Oral Presentations
4:00 pm – 4:10 pm	Closing Remarks
4:20 pm – 6:00pm	**Reception with Poster Exhibition and Networking**

Regulatory Workshop – 15 September 2022

10:00 am – 11:00 am	Registration
11:00 am – 11:10 am	Welcome
11:10 am – 12:10 pm	Oral Presentations
12:10 pm – 12:40 pm	**Break**
12:40 pm – 1:00 pm	Oral Presentations
1:20 pm – 2:20 pm	**Lunch**
2:20 pm – 3:20 pm	Panel Session
3:20 pm – 3:30 pm	Closing Remarks

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Event Programme
Industry Event – 14th September 2022

10:00 am – 11:00 am	Registration
11:00 am – 11:10 am	Welcome and Introductions
11:10 am – 11:30 am	Gianluca Fontana Imperial College London
11:30 am – 11:50 am	Chaohui Guo Roche Diagnostics
11:50 am – 12:10 pm	Julien Fauqueur Benevolent AI
12:10 pm – 12:40 pm	Break
12:40 pm – 1:00 pm	Sigourney Waibel NOAH x Ethomix
1:00 pm – 1:20 pm	John McNamara IBM (Virtual presentation)
1:20 pm – 1:40 pm	Firat Güder Imperial College London
1:40 pm – 2:00 pm	Sam Tukra Third Eye Intelligence
2:00 pm – 3:00 pm	Lunch and networking
3:00 pm – 3:20 pm	Evie Dineva and Charlotte Jackson Agilisys
3:20 pm – 3:40 pm	Paul Bentley Imperial College London
3:40 pm – 4:00 pm	Cathie Sudlow BHF Data Science Centre, HDR UK Usher Institute, University of Edinburgh (Virtual presentation)
4:00 pm – 4:10 pm	Closing remarks
4:20 pm – 6:00 pm	Poster exhibition and Reception

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Event Programme
Regulatory Workshop – 15th September 2022

10:00 – 11:00	Registration with Tea/Coffee on arrival
11:00 – 11:20	Welcome and Introductions
11:30 – 11:50	Hugh Harvey Hardian Health
11:50 – 12:10	Anjali Mazumder The Alan Turing Institute
12:10 – 12:40	Break
12:40 – 1:00	Eleanor Harwich Newmarket-Strategy Ltd
1:20 – 2:20	Lunch
2:20 – 3:20	Panel session Panel session chair: Ahmed Fetit UKRI Centre for Doctoral Training in AI for Healthcare, Imperial College London Panel members - invited speakers
3:20 – 3:30	Closing remarks

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Speakers
Industry Event – 14th September 2022

THE NEED FOR EVIDENCE-BASED DIGITAL HEALTH

Gianluca Fontana
Imperial College London

Gianluca Fontana is Deputy Director of the Institute of Global Health Innovation (IGHI) at Imperial College London and co-founder and CEO of Prova Health, a company focused supporting health innovators, particularly on evidence generation.

Gianluca has overseen a multi-year research programme in digital health at IGHI, including work on cybersecurity, clinical simulation and health data policy. He has been responsible for the creation and delivery of the NHS Digital Academy. He has led the operations of the REACT study on COVID-19 community transmission.

In his previous job at McKinsey and Company, he helped start and run the Leading Health Systems Network, a global network of health systems, and the UK Advanced Healthcare Analytics Group. He has advised health systems, hospitals and pharmaceutical companies in over 20 countries.

He holds MSc and bachelor's degree from Bocconi University in Milan.

CHALLENGES & INNOVATIVE APPROACHES TO EVIDENCE GENERATION FOR DIGITAL HEALTH SOLUTIONS

Chaohui Guo
Roche Diagnostics

Dr. Chaohui Guo is Evidence Generation Lead in Roche Information Solution (RIS), Roche Diagnostics. She joined Roche in 2019 and has worked on end-to-end evidence generation for digital health products. Prior to Roche, she worked in the McKinsey & Company, Zurich office, focusing on the healthcare industry. She has a MPhil in Biology from the University of Cambridge, PhD in Neuroeconomics from Zurich University, and worked in UPMC hospital as a Postdoctoral Fellow.

Chaohui has a deep understanding of the landscape and challenges of a wide variety of digital health solutions. She led teams and collaborated broadly with industry and academic partners, resulting in innovative solutions to address these challenges and peer-reviewed scientific publications in prestigious journals.

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HOW WE LEVERAGE ML AND AI TO DEVELOP LIFE-CHANGING MEDICINES

Julien Fauqueur
Benevolent AI

Julien Fauqueur is a Lead AI Scientist at BenevolentAI, where he develops natural language processing methods for biomedical information extraction. He holds a PhD in computer science from INRIA in France. While a research associate at the University of Cambridge, then as a senior researcher in industry, he developed new methods and products using computer vision and machine learning. He co-authored around 30 academic publications and 5 patents.

WEARABLES AND AI FOR ENHANCED PATIENT BEHAVIOUR MONITORING IN HOSPITAL AND AT HOME

Sigourney Waibel
NOAH x Ethomix

During her PhD at Imperial College, Sigourney cofounded a venture which uses wearables and machine learning to deliver enhanced patient behaviour monitoring in hospital and at home. Prior to this, she worked at the Queen Square National Hospital for Neurology and Neurosurgery, Great Ormond Street Hospital Institute of Child Health, Imperial Innovations, and Horizon2020 European Institute of Innovation and Technology researching healthcare technologies.

INNOVATIONS WITH HEALTH WITH ACADEMIA

John McNamara
IBM

John McNamara is an IBM Master Inventor and Thought Leader Technical Specialist with consultancy experience in the fields of health, disease control, defence and banking. Beyond this, John is also the IBM UK University Programs Lead, an Hon Professor at UCL and an Advanced Visiting Research Fellow at the University of Sheffield.

FLEXIBLE AND STRETCHABLE WEARABLE SENSORS FOR PHYSIOLOGICAL MONITORING

Firat Güder
Imperial College London

Dr. Firat Güder is a principal investigator in the Department of Bioengineering at Imperial College London. Firat and his teamwork in the interface of material science, electronics, chemistry and biology, focusing on the development of intelligent interfaces to connect complex chemical and biological systems with machines. Firat is passionate about solving problems concerning animal and human health, agriculture, and food systems. In addition to his scholarly activities, he has also co-founded multiple start-ups to translate his research to address real world problems. For more information on Güder Research Group please visit www.guderesearch.com

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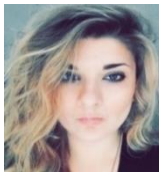
CREATING A MACHINE LEARNING PRODUCT FOR INTENSIVE CARE IN THE NHS

Samyakh (Sam) Tukra
Third Eye Intelligence

Sam is the Founder & CEO of Third Eye Health, next-generation healthcare technology powered by self-designing AI, which is dynamic, adaptive, and functions 24/7.

He is completing his PhD in 3D computer vision applied in robotic surgery at the Hamlyn Centre at Imperial College London. He also holds a MSc in Robotics from Imperial College London and a MEng in Medical Engineering from Cardiff University. His research focus spans not only in Computer Vision, but also Natural Language Processing and Reinforcement Learning in healthcare and beyond.

RESHAPING THE HEALTHCARE LANDSCAPE WITH ARTIFICIAL INTELLIGENCE: SUCCESS STORIES AND CHALLENGES
(Joint presentation)



Evie Dineva
Agilisys

Evie is Head of Data Science and Advanced Analytics at Agilisys, which is a UK-based consultancy who operate in the public sector. In this role, Evie is the lead for advanced analytics and Artificial Intelligence, working closely with partners on technology innovations, and helping customers maximise the potential of data and drive additional value through insights and machine learning. Evie brings together a customer-focused solution background with experience working with business intelligence, analytics and artificial intelligence. She is passionate about deriving value from data assets for organisations and individuals through solving real-world business problems and pioneering the adoption of innovative technologies and ways of thinking.

Charlotte Jackson
Agilisys

Charlotte is a Strategy & Research Consultant in the Data and Insights Team at Agilisys. Charlotte is passionate about population health and identifying ways in which data and novel technologies such as AI can improve multi-agency working and reduce health inequalities. She brings a people and outcomes-focussed approach whether it is a strategy, operating model or AI solution. Charlotte is skilled in data analysis, research and evaluation through her background in academia and is now part of a team at Agilisys developing AI solutions spanning several areas including Healthcare, Adult Social Care, Homelessness and Police Demand Complexity.

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HOW TO SPIN OUT A SUCCESSFUL MEDTECH: CASE STUDY

Paul Bentley
Imperial College London

Paul Bentley is Clinical Director of the Imperial College Network of Excellence in Rehabilitation Technology, Clinical Senior Lecturer and Honorary Consultant Neurologist within Brain Sciences, Imperial College London. After training at Cambridge and UCL, he undertook a research fellowship in Psychology Dept, Harvard, and a PhD in cognitive neuroscience at UCL. He is the first UK neurologist to have been dually accredited in stroke medicine by the Royal College of Physicians. His research into clinical AI and robotics has been credited in recent years by The Lancet Editorial; UK Chief Medical Officer Annual Report; the UK Ministry for Innovation in the Dept of Health & Social Care; awarded prizes including from NHS England and UK Stroke Association; and featured on the BBC News, BBC Newsnight, CBS News, The Times, Telegraph, and The Sun. He currently leads on a NIHR-funded project developing a social therapy network for remote-interactive physiotherapy; and is the Clinical Founder of a university spinout for self-directed exercise-gaming therapy.

WHAT IS THE BHF DATA SCIENCE CENTRES DOING TO SUPPORT UK POPULATION-WIDE HEALTH DATA SCIENCE?
(VIRTUAL PRESENTATION)

Cathie Sudlow
BHF Data Science Centre, HDR UK
Usher Institute, University of Edinburgh

Professor Cathie Sudlow is the inaugural Director of the British Heart Foundation Data Science Centre, which aims to improve the public's cardiovascular health through the power of large-scale data and advanced analytics across the UK and beyond. She is also Chair of Neurology and Clinical Epidemiology at the University of Edinburgh. Cathie was previously Director of the Centre for Medical Informatics at the Usher Institute, University of Edinburgh and was the first Research Director for HDR UK in Scotland. From 2011-2019, she was Chief Scientist of UK Biobank, a large-scale research resource, with in-depth genetic and health information from half a million UK adults, accessible to approved researchers worldwide, studying a wide range of common, rare and life-threatening health conditions.

Cathie is a clinical neurologist and epidemiologist. Her clinical work involved assessing and treating patients with suspected acute stroke in the hospital emergency department. Her research interests are firmly embedded in the world of big data, in particular large-scale, collaborative, open-science initiatives to understand the causes (genetic, environment and lifestyle), consequences of, and best treatments for common diseases of middle and older age. These have included initiatives to establish the role of antithrombotic drugs in preventing heart disease and stroke, to investigate differences between stroke subtypes, and to discover genes that influence stroke. From 2011, she led efforts follow the health of UK Biobank participants through linkage to national health datasets, and during 2020-

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2021 worked with NHS Digital to develop the first trusted research environment to hold and enable access for research to linked health data for the whole population of England.

She was elected as a fellow of the Royal Society of Edinburgh in 2018 and awarded an OBE for services to medical research in the Queen's Birthday Honours in 2020. In 2022, Cathie was elected as a fellow to the Academy of Medical Sciences and has most recently been appointed as Deputy Chair to the Data Science Strategic Advisory Group (DSAG), Medical Research Council (part of UK Research and Innovation).

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Speakers
Regulatory Workshop – 15th September 2022

NUANCES OF AI REGULATION

Hugh Harvey
Hardian Health

Dr Harvey is an experienced clinician and health technology advisor, with a focus on leveraging big data and artificial intelligence. He is a board-certified consultant radiologist and academic, trained in the NHS and Europe's leading cancer research centre, the Institute of Cancer Research, where he was twice awarded ICR Science Writer of the Year. He is currently Managing Director at digital health consultancy Hardian Health.

He has previously held lead roles at two flagship UK start-ups, leading to successfully gaining the world-first CE marking for an AI-supported triage service, and the first UK CE mark for a deep-learning medical device.

He was a co-opted member of the Royal College of Radiologists informatics committee and sat on their AI policy reference group. He also acted as co-chair to the Topol health technology review for Health Education England commissioned by the Secretary of State for Health and Social Care.

He now serves as board advisor to many AI start-up companies across the globe and retains an academic interest as a board member of the global open source scientific journal Nature: Digital Medicine, and holds an honorary research fellowship at the Institute of Cognitive Neurosciences at UCL.

TOWARDS REGULATING AI FOR HUMAN RIGHTS AND INCLUSION BY DESIGN

Anjali Mazumder
Alan Turing Institute

Anjali Mazumder is the Theme Lead on AI and Justice & Human Rights and the Research Chair for Equality, Diversity and Inclusion at The Alan Turing Institute. (The Alan Turing Institute is the UK's national institute of data science and artificial intelligence.) Her work is at the intersection of algorithms and the law where her interest is in actualising the benefits and opportunities of data science and AI whilst mitigating and balancing against its potential harms and risks in applications of justice, health, education, finance, etc. Her research focuses on developing, evaluating and expanding the solution space for socio-technical systems addressing issues of fairness, inequalities, robustness and privacy; and promoting the law, human rights, diversity and inclusion at the core of responsible data, data flows and AI research, innovation and governance. She has over 15 years' experience tackling fundamental statistical problems of societal importance working at the interface of

research, policy and practice in the UK, the US, and Canada, in the areas of justice, education, health and public safety, and, fostering multi-disciplinary and cross-sector collaborations. She serves the statistics community in various ways including as an elected Council member of the Royal Statistical Society, and committee member of its respective Statistics and the Law, and the Data Science sections. She was appointed to Canada's National DNA Databank Advisory Committee (2012-2018) and currently serves on the Research Advisory Board Panel for the Educational Testing Service, and the senior management board of the UK's Policy and Evidence Centre for Modern Slavery and Human Rights. She holds a doctorate in Statistics from the University of Oxford and two masters' degrees in Measurement and Evaluation, and Statistics from the University of Toronto.

REGULATION AND INNOVATION: AN UNHAPPY COUPLE?

Eleanor Harwich
Newmarket-Strategy Ltd

Eleonora's work focuses on helping clients within the digital health sector with their regulatory, commercial and go to market strategies. She has deep expertise in digital health with particular focus on cutting edge technologies, like artificial intelligence, and regulation. She was previously Head of Collaborations at the NHS AI Lab where she was responsible for the successful publication of two key reports on the evaluation of AI-enabled medical devices, and ways to develop and deploy AI-enabled medical devices across jurisdictions. Prior to joining the NHS AI Lab, she was Director of Research at Reform think tank. She is a member of the British Standards Institution and is currently sitting on the safe and ethical use of artificial intelligence in healthcare committee (BS30440).

Panel Session Chair

Ahmed Fetit
UKRI Centre for Doctoral Training in AI for Healthcare, Imperial College London

Dr Ahmed Fetit is a Senior Teaching Fellow at the UKRI Centre for Doctoral Training in AI for Healthcare, Imperial College London, where he is responsible for the teaching and research training provisions. His research interests are in principled applications of machine/deep learning technologies to healthcare, particularly in medical imaging. He previously worked on several cross-disciplinary projects in collaboration with NHS Trusts across the UK.

Ahmed holds a PhD from the University of Warwick, where he researched applications of image analysis and machine learning for the diagnosis and prognosis of tumours from clinical MRI data. He received his MSc and BEng (Hons) degrees from the University of Birmingham.

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Event Sponsors & Partners

Acknowledgements

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