

RE-WORK

DEEP LEARNING IN HEALTHCARE SUMMIT



LONDON
SEPT 20 - 21, 2018

EVENT REPORT:

Highlights, attendee & speaker feedback, agenda overview,
photos, videos, interviews & more

HEADLINE SPONSORS

MIRADA
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SCAN^S



HUBSCIENCE

DEEP LEARNING IN HEALTHCARE SUMMIT



2 DAYS



200 +
ATTENDEES



8
EXHIBITORS



40+
SPEAKERS



12+ HOURS OF
NETWORKING



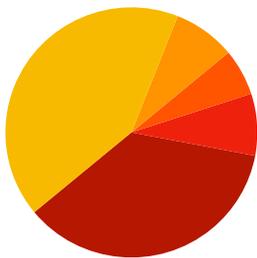
5 INTERACTIVE
WORKSHOPS



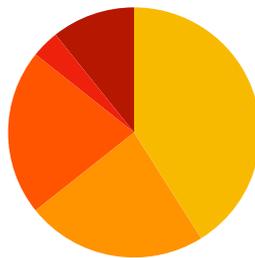
10 EXPERT
INTERVIEWS



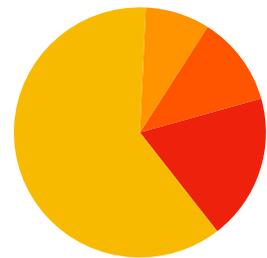
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SPONSORS



- JOB ROLES**
- CXOS & founders
 - Data Scientists
 - Research Scientists
 - Engineers
 - Students & Academics



- COMPANY SIZE**
- Just me
 - 2 - 100
 - 101 - 500
 - 501 - 1000
 - 1001 - 5000
 - 5001 - 10000
 - 1000+



- LOCATION**
- UK
 - Europe
 - US
 - Other

A NOTE FROM THE FOUNDER

This event saw the 6th global Deep Learning in Healthcare Summit return to London for the third year. Deep Learning is driving advancements in healthcare, medical research, diagnostics as well as increasing efficiency and accessibility in the sector. We've witnessed a huge growth in the interest of technological applications, as well as academic progress in the field.

Each year, we've seen world leaders like Google Brain return to share their research, as well as local global academic institutions such as the UCL and up-and-coming startups join the event. The event encouraged collaboration between research and industry, through interactive workshops, Q&A and networking over the 2 days.

Running alongside the healthcare track was 4th annual European edition of the Deep Learning Summit which showcased academic advancements as well as practical applications.

For the first time, a selection presentations from both tracks were streamed live online. As well as fascinating talks and discussions, we welcomed a new interactive track focused on practical applications, exploring case studies from industry, as well as societal questions including ethics, and the challenges of investing in AI startups.

Our events continue in Toronto this **October 25 & 26** for the [Deep Learning Summit](#) and the [AI for Government Summit](#), and in Houston this **November 29 - 30** at the [Machine Learning for DevOps Summit](#) and the [Applied AI Summit](#).

We hope to see you there!

Nikita Johnson
CEO & Founder
RE•WORK

ATTENDEE FEEDBACK

As the rate of evolution in AI is extremely quick I'm looking forward to meeting entrepreneurs and digital health thought leaders working at the forefront of applied AI in health sciences

Zera Ong, Zelta Technologies



The balance of business practicality and academic advances within the talks is really quite fantastic.

**Janet Bastiman,
Storystream AI**



As a Biologist and Data Scientist - it's been fantastic to learn more about the latest applications of deep learning and AI in healthcare - and more importantly, the results to-date!

**Belal Chaudhary,
Glia Lab**



It's my first time at a RE•WORK event and its been fantastic, much busier than I expected. I work in medicine but I am really looking forward to the NASA talk as I have a great personal interest in space.

**Tomasz Grzywalski,
StethoMe**



AI and DL are constantly evolving. There are always new problems to solve, and new boundaries to overcome. It is a fascinating, and ever changing field of study, so I've enjoyed the networking and all the talks.

Armin Ziadlou, UCL



It's interesting that the NHS have a strong presence at the event and are using AI and Deep Learning in healthcare.

**Adriana Toutoudaki, Cambridge
University Hospitals**



EXPERT SPEAKERS INCLUDED



Trevor Back
Research Lead
DeepMind Health



Maithra Raghu
Research Scientist
Google Brain



Ahmed Serag
Research Scientist
Philips



Sarah Culkin
Strategic Data Lead
NHS England



Danielle Belgrave
ML Researcher
Microsoft Research



Peter Mountney
Program Manager & Sr.
Key Expert Scientist
Siemens Healthcare



Graeme Rimmer
Engineering Manager
Google



Caryn Tan
Analytics Strategist
Accenture



Polina Mamoshina
Research Scientist
Insilico Medicine



Ben Glocker
Lecturer, Medical Image
Computing
Imperial College London



Cansu Canca
Founder/Director
AI Ethics Lab



Eduardo W. Jorgensen
CEO
MedicSen



Yinyin Yuan
Team Leader
The Institute of
Cancer Research



Nikolas Pontikos
Researcher & Data Scientist
UCL & Moorfields Eye
Hospital



Mark Gooding
Chief Scientist
Mirada Medical



John Spindler
General Partner
AI Seed

PRESENTATION HIGHLIGHTS

We're researching into detection of cancers and predicting patient deterioration. Over 80% of all vision impairments could be avoided if detected earlier. This opened up a huge opportunity for Deep Learning to be applied.

Trevor Back, DeepMind



What we are able to do is take tens of thousands of CT scans, take all of this data and run automatic segmentation tools which create mesh's and then in turn training data.

Peter Mountney, Siemens Health



One of the main challenges in medicine is that highly trained human experts disagree with data on data instances. In more than 21% of cases there is significant disagreement. We study the application of ML to predict which instances are likely to give rise to maximal expert disagreement.

Maithra Raghu, Google Brain



When a search engine delivers a biased result, should it be altered in order to deliver a desired result for the public, or an accurate result that may not be desired?

Cansu Canca, Ethics AI Lab



We started a project working on lung cancer and we use a different approach because of the scale of sample sets we have. There is a shortage of research pathologists in the country and so we developed this web system by ourselves.

Yinyin Yuan, The Institute of Cancer Research



Whilst AI can solve countless problems, we need to educate the clinician community on what AI can't do, not what it can do.

Mark Gooding, Mirada



AGENDA OVERVIEW

DAY 1

DL & HEALTHCARE IN PRACTICE



If you go from hospital level data to regional level data, you can see what happens on scale - and we should expand this work further.

Sarah Culkin, NHS

DL IN MEDICAL IMAGING



More in an image is not always better. We need to remove irrelevant information. If it moves together it belongs together.

Adam Kosiorek, DeepMind

AI IN DRUG DISCOVERY & DEVELOPMENT



Drug discovery is very expensive, and deep learning can drastically help to reduce these costs.

Polina Mamoshina, Insilico Medicine

DL IN DIAGNOSTICS



We're predicting disease more accurately by using neural network representations of clinical concepts by using all of the available data on millions of patients.

Spiro Denaxas, UCL

AI ASSISTANTS



Wearable sensors provide the opportunity for continuous passive monitoring of health indicators. In particular the heart rate sensors can extract the pulse waveform; and that waveform can be mined for heart health indicators.

Graeme Rimmer, Google

DAY 2

STARTUP SESSIONS



How many articles are needed to be annotated manually to get results training a system for text analytics? You don't need hundreds, just a small sample size will give sufficient results!

Time Polgár, Hubscience

Personalized self care, preventive diagnosis, individual treatments - everything is available thanks to predictive models.

Eduardo W. Jorgensen, Medicsen

DL APPLIED IN HEALTHCARE



There are many studies that have been done which show that doctors vary largely in terms of diagnosis, in more than 21% of cases there is significant disagreement.

Maithra Raghu, Google Brain

Whilst deep learning is incredibly promising, how do we know when the machine gets it wrong? We're trying to address these issues by using deep learning to analyse medical scans.

Ben Glocker, Imperial College London

PANEL DISCUSSIONS

Regulation and Global Policy - AI and Autonomous Systems



Ethically Handling Data - What is Your Responsibility and What Should be the Next Step?



PANEL DISCUSSIONS

REGULATION AND GLOBAL POLICY - AI AND AUTONOMOUS SYSTEMS

Loubna Bouarfa:

We need to be transparent about everything we can be. There are some things that are in a black box, but the key is to find the points where we can be transparent, and this is where we can come to an agreement.

Jade Leung:

Policy and regulation are super slow so we need to think ahead. There are trackable ways to think about this, it's not impossible to do.

Andrea Renda:

If you want to go fast, go solo, but if you want to go far, go together. That's why you need to jump through more hoops in Europe because people are working together.



Andrea Renda

Sr Research Fellow & Head of Global Governance

Regulation, Innovation & Digital Economy



Matthew Fenech (MODERATOR)

Artificial Intelligence Policy Consultant

Future Advocacy



Alison Hall

Head of Humanities

PHG Foundation/University of Cambridge



Jade Leung

Researcher & Head of Partnerships

Governance AI Program, Future of Humanity Institute



Loubna Bouarfa

CEO & Founder

OKRA Technologies



Caryn Tan

Analytics Strategist

Accenture



Aimee Van Wynsberghe -

Assistant Professor of Ethics and Robotics

TU Delft



Alice Piterova

Head of Privacy

Hazy



Cansu Canca

Founder/Director

Ethics AI Lab

ETHICALLY HANDLING DATA - WHAT IS YOUR RESPONSIBILITY AND WHAT SHOULD BE THE NEXT STEP?

Aimee van Wynsberghe:

Ethics is 'the study of the good life' trying to paint a picture of what this is and how we might achieve it. Can technology help us achieve it, or change the picture of it?

Cansu Canca:

We need an ethicist as part of the design team. Be critical in a friendly manner and push the boundaries so ethics is part of the innovation process.

Alice Piterova:

Having a conversation with a robot like Sophia is one thing, but if you have AI as a colleague, how should you treat them? Should they have rights? Employee rights?

WORKSHOPS

AI ETHICS LAB, THE MAPPING

When searching for “professor” or “CEO” on Google images, the results show overwhelmingly white male pictures. The search results present an extreme bias against representing diversity. The workshop used this case as an example on how to structure the ethical problem at hand and its underlying principles before moving on to try solving it.



Cansu Canca
Founder/Director
Ethics AI Lab



Laura Haaber Ihle
Research Fellow
Harvard Department of Philosophy



Danielle Belgrave
ML Researcher
Microsoft Research



Sarah Culkin
Strategic Data Lead
NHS England



Daniel Leightley
Post-Doc Researcher
King's Centre for Military Health Research

EXPLORE WITH THE EXPERTS

Questions Covered

- How do we incorporate expert knowledge into Deep Learning?
- Who is responsible when the ‘machine’ makes an incorrect decision that costs lives?
- How do we build and develop trust in AI technology, especially within the healthcare sector?

PREDICTIVE & GENERATIVE DL FOR GRAPHS

“Graphs are more complex than trees, for example, as they lack the natural order - this poses the challenge of where to begin?”

Attendees looked at how graphs can model real-world complex objects, and honed in on recent advances using DL for graphs. Participants looked at BenevolentAI’s recent approaches using reinforcement learning.



Amir Saffari
Senior VP of AI Research
BenevolentAI



Caryn Tan
Analytics Strategist
Accenture

HOW TO DESIGN AI WITH HUMAN CENTRICITY

The workshop looked at the key question of building AI that is not marginalising groups within society. How do we prevent negative unintended consequences?

“AI and Humans are far superior to AI or Humans alone. This is why they must be designed to work together.”

A FOUNDER’S STORY & MEET THE INVESTORS

Eduardo Jorgensen, Founder of **MedicSen** shared his startup story and explained how they have seen significant growth over the past year since launching GlycSen for intelligent treatment of insulin dependent diabetes. Leading investors then shared industry insights and tips on a panel discussion.

Investors included: **Dmitry Kaminsky**, Managing Partner, **Deep Knowledge Ventures** • **John Spindler**, General Partner, **AI Seed** • **Frederic Lardieg**, Partner, **Octopus Ventures**

INTERVIEWS & PODCASTS

As well as hosting events, RE•WORK has a catalogue of online resources with White Papers, video interviews, our blog, and the Women in AI podcast. At each event, we chat with speakers and industry experts who share their expertise.



Jade Leung, Researcher & Head of Partnerships, **Governance AI**

Eunice from the RE•WORK team interviewed Jade for the Women in AI podcast, and discussed the ethics of AI across multiple industries, as well as the challenges of being a woman working in the field. Jade's background is in engineering, international law and policy.



Trevor Back, Project Manager/ Research Lead, **DeepMind Health**

Trevor works closely with DeepMind Health NHS partners on research projects, exploring how technology could help clinicians provide more effective and faster care to patients. He shared some of the exciting projects in the pipeline with Moorfields Eye Hospital.



Cansu Canca & Laura Haaber Ihle, **Ethics Mapping Workshop**

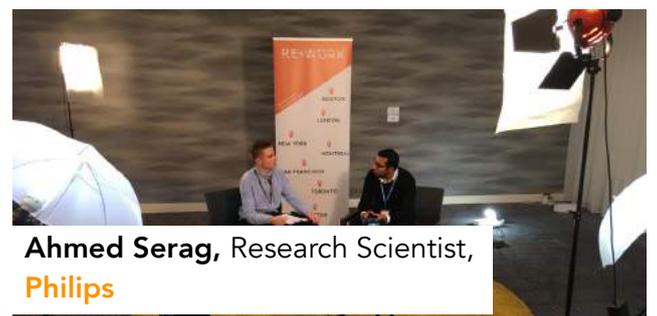
The AI Ethics specialists explained how they came up with their highly interactive session, and shared their motivations behind the session. *"Ethics and AI should go hand in hand - it helps innovation. Ethics in the middle of AI, it's not an outside thing."*

We're always open to new collaborations and love hearing from attendees and speakers alike. If you are working on something you think would be valuable to our content hub, don't hesitate to get in touch with Yaz: yhow@re-work.co



Eduardo W. Jorgensen, CEO, **MedicSen**

Priya from Verdict UK spoke with Eduardo in a filmed interview about the startup's journey to success. Eduardo touched on his background in medicine and his journey to working with deep learning to create predictive algorithms to help with diabetes management.



Ahmed Serag, Research Scientist, **Philips**

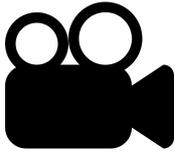
With over 12 years of experience working in AI, Ahmed shared his current work in AI and DL for cancer detection in a filmed interview. He explained how he's working with DL to help pathologies become faster, cheaper and more efficient.



Maithra Raghu, Research Scientist, **Google Brain**

Maithra shared her work in 'Direct Uncertainty Prediction for Medical Second Opinions' on RE•WORK's podcast, and explained how machine learning can help predict instances where human experts are likely to disagree with the data.

WHAT'S NEXT?



Video presentations will soon be available online and you can [register here](#), or to upgrade to access the Deep Learning Summit. On our video hub we also have extensive playlists from our past events.



Subscribe to the [Women in AI Podcast](#) to hear the latest episodes and learn from influential women working in AI.

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UPCOMING EVENTS

TORONTO, OCTOBER 23 - 26, '18

Women in AI Dinner, 23
Deep Learning Summit, 25 - 26
AI for Government Summit, 25 - 26

LONDON, NOVEMBER 20, '18

Women in Machine Learning Dinner

HOUSTON, NOVEMBER 27 - 30, '18

Women in AI Dinner, 27
Applied AI Summit, 29 - 30
Machine Learning for DevOps Summit, 29 - 30

MONTREAL, DECEMBER 4, '18

Women in AI Dinner

SAN FRANCISCO, JANUARY 22 - 25, '19

Women in AI Dinner, 22
Deep Learning Summit (multi-track), 24 - 25

LONDON, FEBRUARY 20, '19

Women in AI Dinner

BOSTON, MAY 22 - 23, '19

Deep Learning for Robotics Summit
Deep Learning for Healthcare Summit
Deep Learning Summit

SAN FRANCISCO, JUNE 20 - 21, '19

AI for Good Summit
Applied AI Summit

View our complete calendar of events, and register now for upcoming summits [here](#). For ticket enquiries, contact John: john@re-work.co

Want to contribute to our online or live event content? Email Yaz: yhow@re-work.co