



UNIVERSITÀ  
DI TORINO

# About the Lecturer

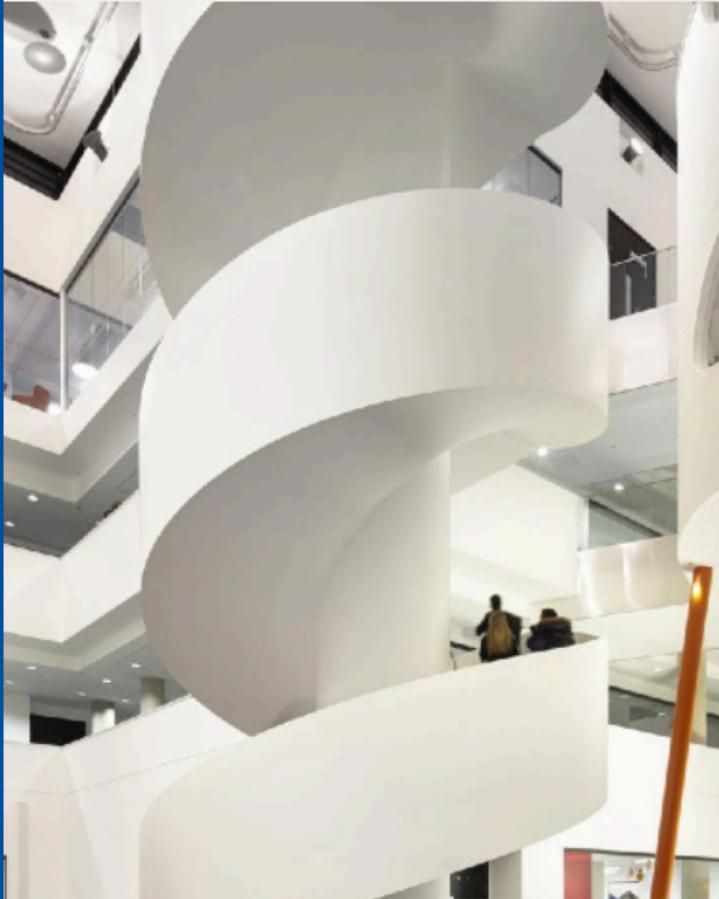
Prof. Fabio Ciravegna

Full Professor (Pervasive Computing)

Dipartimento di Informatica

Università di Torino

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# About myself

- Education:

- Degree in Computer Science, University of Torino
- PhD in Computer Science, University of East Anglia

- Work:

- 1988-1993: Centro Ricerche Fiat, Researcher
- 1993-2000 ITC/IRST (FBK), Trento - Senior Researcher
- 2000-2022: The University of Sheffield
  - Professor of Pervasive Computing
  - 2009-2012: Director of R&I for the University (Digital World):
    - £8.9m of new projects in my last year
  - 2020-2022: Director of the University Technology Centre on AI for Defence and Security
  - 2020-2021: CEO, Aeqora Ltd (start up)
  - 2002-2019: Director of EU projects for €25m
- 2022-present: Università di Torino



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Sheffield.

# The University of Sheffield

- The largest Engineering Faculty in the UK

- 75<sup>th</sup> in the QS World Universities Table

- 11<sup>th</sup> in Europe int THE's Teaching Quality Table



A world-class university – a unique student experience



23 May 2019

University of Sheffield number one in UK for engineering research income and investment

Top five in the UK for  
research excellence

Department of Computer Science



Research Excellence Framework 2014

# About My Research

- Pervasive computing with a focus on large scale data management.
  - **Data capturing**
    - Over large scale from multiple devices and sources
  - **Data analytics and Prediction**
    - To inform final users, problem owners, etc.
- Application areas:
  - From aerospace, to smart cities, environmental monitoring, emergency services, health, sports, photography, etc.
- Major partners:
  - Public Health England, Kodak, JustGiving, Rolls-Royce, Glastonbury Festival, City Councils, Football Whispers...



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# My Claim to Impact

- **Startups**

- 2007: K-Now Ltd
- 2012: The Floow Ltd
- 2020: Aeqora Ltd

\$69m exit in April 2022

- **Intellectual Property** sold or released to industry and government

- Rolls-Royce, JustGiving,
- Public Health England, UK Ministry of Defence
- Kodak, Football Whispers



- **Technology** released to millions of users

- 1 million users for Public Health England
- 2.5 million users served for Football Whispers
- 1 million users monitored in emergency control rooms





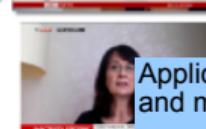
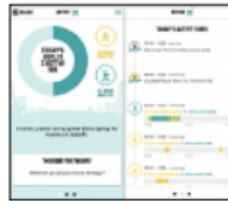
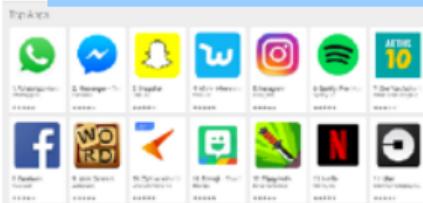
# Health

- Public Health England
  - Lifestyle tracking via Mobile Phones
  - 1 million users
  - 1 billion mobility data points collected
- Technology released in TV
  - 5 Hospitals in UK, Germany and Israel
- Moreover:
  - >6,000 people (MoveMore Sheffield)
  - >5,000 of bikes with Birmingham City Council
  - >1,000 people in Santander (SP)



Public Health  
England

7th most downloaded app in the UK



Application and server infrastructure developed and managed by the University of Sheffield

*PHE were able to develop and launch the first free-to-use mobile app that provided the user with information on time, intensity and periodicity [of physical activity]. The app played a significant role [...] and made a major contribution to the overall success of the One You campaign*

Anand Amlani, Head of Marketing – Living Well @ Public Health England

Hello magazine sponsored  
Facebook live event

Home | Football | Formula 1 | Cricket | Rugby U | Rugby L | Tennis | Golf |  
Get Inspired > England & Wales Cup | Scotland | Wales | Northern Ireland

Active 10: Eamonn Holmes joins sup  
of 10-minute fitness app

0 24 August 2017 Get Inspired



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# Aerospace

- 10 year of research with Rolls Royce plc
  - Shortlisted twice for the Rolls Royce Director of Research Creativity Award

*The nomination is given to solutions which can sensibly change the future way of working of the company and it is selected by vote by senior employees*

*Colin Cadas, Rolls Royce Associate Fellow Knowledge Management*

- Terminology recognition
  - 10,000 users at Rolls Royce plc
  - Part of a KM suite saving RR £14m/year

*TR is the core component of a Knowledge Management improvements programme focussing on information extraction and data mining thousands of documents. It was strategically productionised as part of our corporate search strategy, delivered to over 10,000 engineers and with cost savings in the £14Millions*

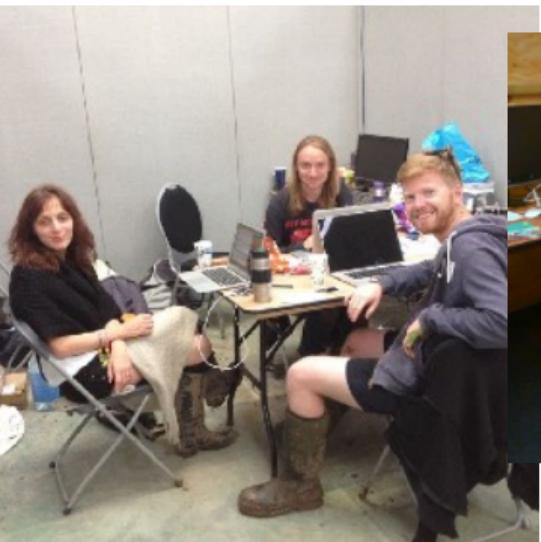
*Colin Cadas, Rolls Royce Associate Fellow Knowledge Management*





# Social Media Analysis

- Emergency control rooms of events involving >1M people
  - Including the Glastonbury festival (200k people) (twice)
  - Evacuation of 30,000 people from Vicenza (Italy)
  - Italy invested €3.5 in a followup project (thank you, Brexit!)



## Rolling Stones make Glastonbury debut

Michael Eavis's lifetime aim to see the band on the Pyramid stage is finally realised 43 years after festival first took place



"The contribution of the OAK group in this process was key. The project made the concept real and applicable; the technology developed by OAK provided concrete proof of the power of the citizen observatories as well as a powerful benchmark for requirement analysis and for the development of the final production technology"

Dr Michele Ferri, Project Manager, Factors, Alas District River Authority



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# And More...

- Football Whispers:

- Social media analysis
  - 70M messages a month analysed
- 35 international leagues, hundreds of teams, thousands of players
- Major customers: Sky Sports and 4-4-2
- From 0 to 2.5m users in 6 months
- Project delivered in 1.5 months

Thanks to the work of the OAK group, we were able to launch on time in January 2016 and with our full service offering – something that we would not have been able to accomplish without their input. [...] In that time our business grew from 0 to 2,500,000 unique monthly users

Vivion Cox, CEO and Founder

- JustGiving

- The largest donation company in the world
  - Income: £3B a year
- Recommender system via social media mining
  - Increased followup visits by 378%

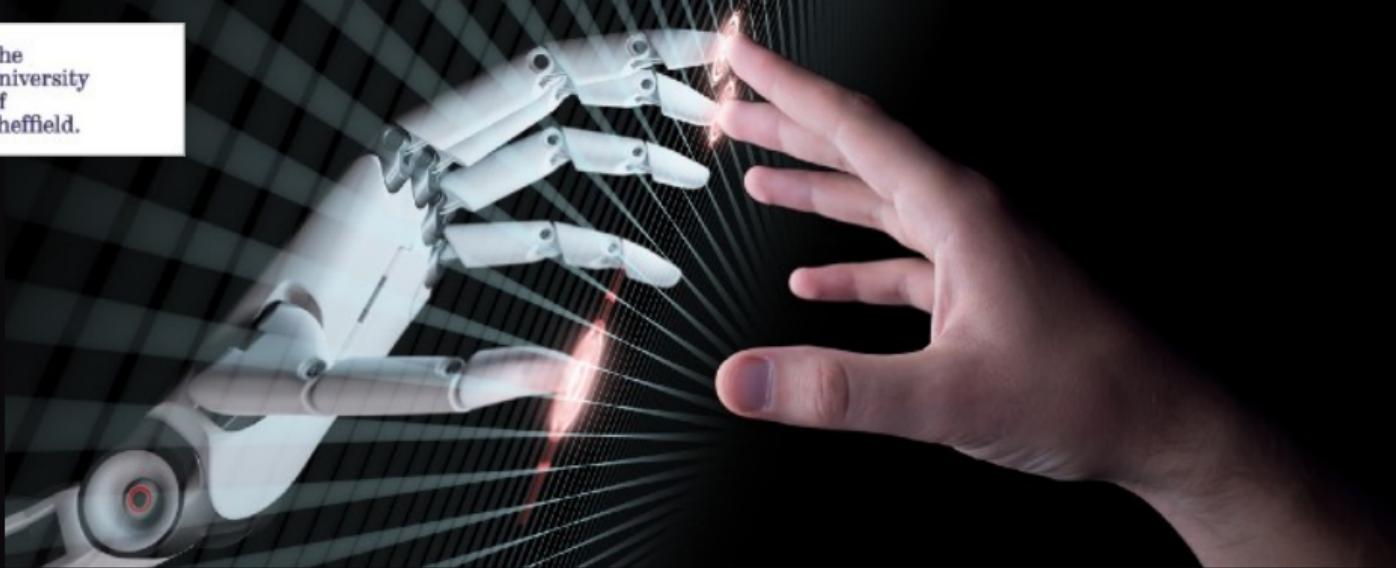
We measured a 378% rise in the likelihood that a user would visit a page when they see it in the "you might be interested in" card in their feed, clearly demonstrating an improvement in the selection of related causes.

Richard Freeman, PhD, Lead Data and Machine Learning Engineer, JustGiving





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# University Technology Centre on AI for Defence and Security

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# Some Activities

- Explainable AI
  - e.g. extraction from learning models
- Dependable AI
  - e.g. monitoring distribution shifts, monitoring activation patterns, trusted datasets
- Deception in media
  - e.g. disinformation detection, bot detection
- Rapid large scale information identification
  - e.g. rapid response to RFIs
- Deception in real life
  - e.g. behaviour and mobility prediction, facial recognition bypass, audio spoofing

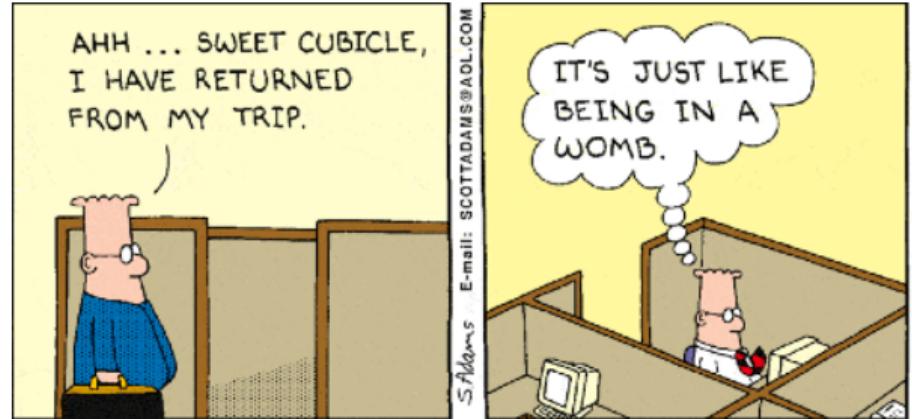


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# Disguises for Face Recognition



# Why am I telling you this?



<http://forums.sailinganarchy.com/index.php?topic/195334-dilbert/>

If you think your job is to be a developer in your cubicle,

Think again



# Questions?

