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Nottingham

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Broadening horizons in the Digital Economy

PhD research at the Horizon Centre for
Doctoral Training in My Life in Data



Autumn 2016

www.cdt.horizon.ac.uk

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About the CDT

The EPSRC Horizon Centre for Doctoral Training (CDT) was originally launched in September 2009, with the overarching research theme of Ubiquitous Computing for the Digital Economy. Five cohorts of students were recruited between 2009 and 2013 under this theme.

In 2013, the Centre was again successful in receiving funding from the EPSRC CDT scheme and, since September 2014, has recruited an additional three cohorts of students to the EPSRC Centre for Doctoral Training in My Life in Data.

So far we have recruited **100 students**, and **34 alumni** have graduated from the programme. Our alumni have gone on to secure employment across Europe, the Middle East and the United States in both industry and academia.



This brochure has been produced to:

- Highlight the breadth of innovative interdisciplinary digital economy research that is undertaken in the CDT, with the support of industry partners and world-class supervisors.
- Showcase the career paths of Horizon CDT alumni and how a Horizon PhD has equipped them to progress to professional positions in the thriving digital economy, and contribute to real-world impact.
- Demonstrate the various opportunities that are available for CDT students within the My Life in Data Centre, and the plethora of skills, expertise and knowledge they can expect to gain as an Horizon CDT student.

We have included case studies from existing students and alumni that we hope you find interesting and inspiring.



Professor Steve Benford
CDT Director

Professor Sarah Sharples
CDT Director

Our partners

The Horizon CDT is fortunate to be able to collaborate and receive support from a wide range of partners from industry, government, innovation centres, creative agencies and not-for-profit organisations. Examples of current partners include BBC, e.on, Experian, Nottingham University Hospitals NHS Trust, Ordnance Survey and Unilever.

Collaborations with digital economy organisations help contribute to the ways that CDT students will establish the technologies, applications and principles to enable citizens to construct digital identities from personal data and effectively manage them to derive economic and social value.

The PhDs that emerge from our CDT are therefore distinct from conventional PhDs; we produce rounded individuals with the skills to work in interdisciplinary teams, including technologists who appreciate the societal context for emerging technologies, and social scientists who are able to shape new technologies.

Each recruited CDT student is carefully matched with a Horizon CDT industry partner based on their skills, qualifications and experience, with the aim of establishing and delivering strong mutual benefit for both the organisation and the student. The CDT student will carry out a three month PhD internship with their partner organisation.



Benefits of partnering with Horizon CDT

Industry partners have continual involvement at all stages of the PhD programme including the recruitment of the student, co-creating the research projects and hosting student internships. In addition, collaborators are able to contribute and help shape the CDT including contributing to doctoral training and strategic input into the Centre via Advisory Board membership.

Specific benefits of partnering with the Horizon CDT:

- It is a cost-effective way for organisations to be involved in relevant leading edge research in digital identity where you may not have the resource or expertise to undertake this alone
- The research project is co-created with the partner so the research is of real commercial significance to their organisation
- Our students are graduates who possess excellent academic track records and are highly committed to solving real world research problems. They experience broad training in interdisciplinary research and professional skills ready for careers in industry as well as delivering a relevant and innovative PhD thesis
- By hosting the student for internships, partners are helping shape the employees of the future who can make a significant impact in the global digital economy
- Through the CDT, partners have access to a network of expert supervisors across a range of disciplines, and opportunities to work with other industry partners.

“Within the Horizon CDT there is a whole host of disciplines that we value, from Human Factors through to English Studies, and the opportunity to bring those together in a multidisciplinary environment is extremely valuable to us”

Jeremy Morley, Chief Geospatial Scientist, Ordnance Survey



PhD studentship opportunities

There are now opportunities to apply for fully-funded studentships with the Horizon Centre for Doctoral Training in My Life in Data. They are open to UK, EU and international applicants.

The technologies of digital identity and personal data pose some of the most profound technical and social challenges facing our digital society today. Our digital identities will define the interfaces to future services we will use for entertainment, wellbeing, government, transport, energy, retail and finance. They will be constructed from our personal data, digital records that capture who we are, and the histories of our digital, physical and social interactions. We are at an exciting moment in time where there are a vast range of opportunities for research in personal data. The Horizon CDT offers you the opportunity to shape the future by recognising a growing public awareness of the value of personal data, presenting exciting opportunities to address concerns over how data is being created, analysed and used.

Our vision is to create digital identity technologies that operate in a fair and transparent manner to empower their users. This is an interdisciplinary challenge, one that needs to bring together expertise in digital technologies, perspectives on digital identity from the social sciences and humanities, and a deep understanding of real-world applications.

The Horizon My Life in Data CDT provides a community of PhD students with the interdisciplinary skills to drive the digital identity and personal data agenda for the twenty-first century. While we do not expect every student to be an expert in all of the areas mentioned above, our aim is to train people to work in multidisciplinary teams, and be ready to become future leaders in industry, the third sector and academia.

Collaboration with industry

Students also work closely with world-leading industry and international partners through supervision, internships, access to resources and expertise, and sponsorship. You will join an established programme led by Professor Steve Benford – an EPSRC Dream Fellow, Visiting Researcher at Microsoft, the BBC's first Visiting Professor, and the recipient of four BAFTA nominations; and Professor Sarah Sharples – Associate Dean for Research in the Faculty of Engineering, who led the Human Factors Research Group to the Institute of Ergonomics and Human Factors President's medal in 2013.

Join us

We are interested in students from a variety of backgrounds, including computer science, engineering, mathematics, human factors, psychology, sociology, business, geography, social science and the arts – with an excellent degree who can demonstrate an enthusiasm for interdisciplinary research. The minimum entry requirement is a 2.1 undergraduate degree and English language IELTS average score of 6.5, with no less than 6.0 in any element.

Benefits

- A fully-funded four-year PhD programme that integrates a leading-edge research project with research training in interdisciplinary skills
- At least one internship with one of our partners
- An enhanced stipend of £16,600 per annum (2017 entry), as well as a personal laptop and additional facilities and resources to support your study
- A cohort of high achieving PhD researchers
- A world-class research environment with a proven track record of successful Horizon CDT graduates

How to apply

Application forms can be downloaded from www.cdt.horizon.ac.uk/apply/current-opportunities and should be returned by email by the advertised closing date, along with a detailed CV, transcript, references and a statement of research interests to emma.juggins@nottingham.ac.uk.

More information on our current research can be found at www.cdt.horizon.ac.uk.

Horizon CDT programme



Horizon adopts a radical approach to training that combines taught elements with industry engagement and practice-led research in a highly flexible manner.

Under the guidance of a personal mentor, each student will undertake a journey from an initially narrow disciplinary focus to a point where they are fully equipped for a career within industry or academia.

This will involve developing interdisciplinary skills in the human-centred design of ubiquitous computing, as well as transferable skills in research, innovation and appreciation of societal impact.

Our Centre for Doctoral Training Programme comprises **three core elements**.

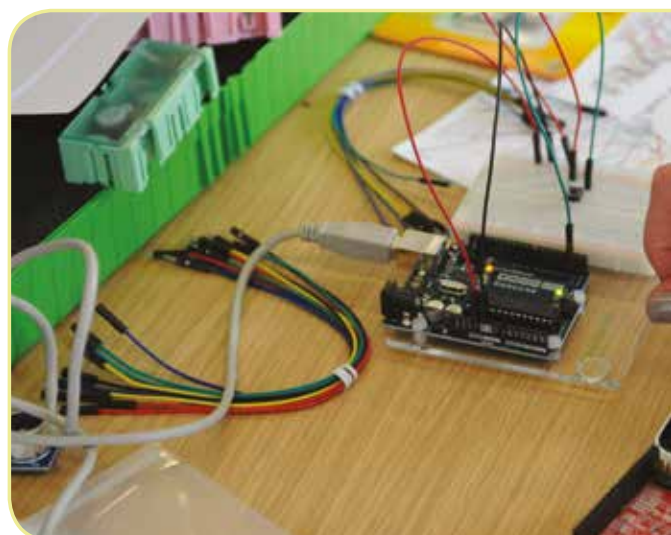
The **taught programme** involves **180 credits** of modules covering interdisciplinary and transferable skills.

Each student undertakes a three-month **internship** with an external partner during their first thirty-six months of study, contributing 20 credits to the 180.

The **research programme** involves a 20-credit PhD research proposal with supervisors and external partners from multiple disciplines and follows a proposal developed during the first year of training.

PhD research topics will be developed during the first year of the programme, drawing on ideas and discussions involving the students, potential supervisors and external partners. That said, the following list offers a few illustrative research topics that would fall under the overarching agenda of the Centre:

- Integrated positioning and navigation support for indoor and outdoor citywide ubiquitous services
- Designing personalised visiting experiences for groups in museums
- Supporting human interaction with autonomous embedded systems
- The impact of University education on digital start-ups
- Domesticating home networks
- Wearable biosensing for adaptive entertainment
- The ethics of ubiquitous computing
- Inhibition training using smartphone technology.



CDT internships

Horizon CDT students benefit from a three month internship with their collaborating industry partner, or with an organisation that will be of benefit to both the student and the hosting establishment. Students have completed internships in countries such as Denmark, India, Malta, Tanzania, the United Kingdom and the United States.

Examples of organisations where Horizon CDT students have already completed internships include:

- BBC
- City Arts Nottingham
- Digital Catapult Centre
- Experian
- International Institute of Information Technology, Bangalore
- Microsoft Research Lab, Cambridge
- Ordnance Survey
- Satellite Applications Catapult
- The Insight Lab
- The World Bank
- Transport Systems Catapult
- University College London
- University of Southern Denmark



Internship case study

Investigating the future of data sharing at the Digital Catapult Centre



CATAPULT
Digital

Tatiana Styliari, a member of the 2014 cohort, completed her internship at the Digital Catapult Centre in London in Summer 2016. She focussed on the role of personal data receipts in the future of data sharing.

“When I joined the Horizon CDT I gained three academic supervisors from a variety of different disciplines (film studies, computer science, human-computer interaction) and two industrial partners: Broadway Cinema & Media Centre and Digital Catapult. After collaborating with them for two years, I decided that a summer internship at the Digital Catapult Centre would be a natural next step.

My three-month project was entitled **‘Researching transparency in data sharing practices: the case of a consent receipt’** and was supervised by

Michele Nati, the Digital Catapult's Lead Technologist in Personal Data & Trust. My work revolved around using many technical skills in areas including UX design, prototyping, qualitative research, privacy, personal data, and digital identity.

I was delighted to hear the outcomes of my internship project had led to an official Digital Catapult project, which is being piloted internally by a team of people I had the pleasure of collaborating with.

This experience not only gave me a successful project to add to my CV and helped me develop necessary skills and knowledge, it introduced me to many people from different backgrounds and departments. These people were always willing to contribute their time and knowledge, and supported me throughout my internship.”

“This experience not only gave me a successful project to add to my CV and helped me develop necessary skills and knowledge, it introduced me to many people from different backgrounds and departments.”

“It was extremely valuable that Tatiana was able to spend several months carrying out research and exploratory work on the idea of personal data receipts, which originated from the Catapult's Personal Data & Trust Network”.

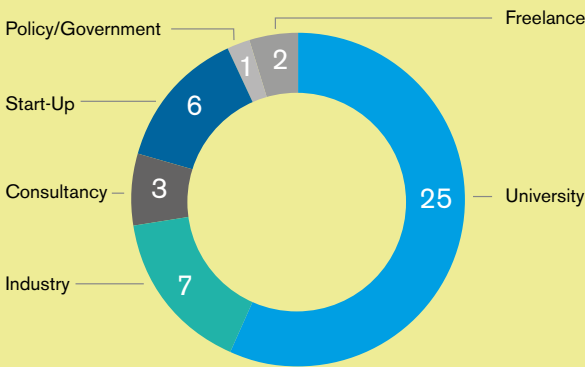
Marko Balabanovic, Chief Technology Officer, Digital Catapult.



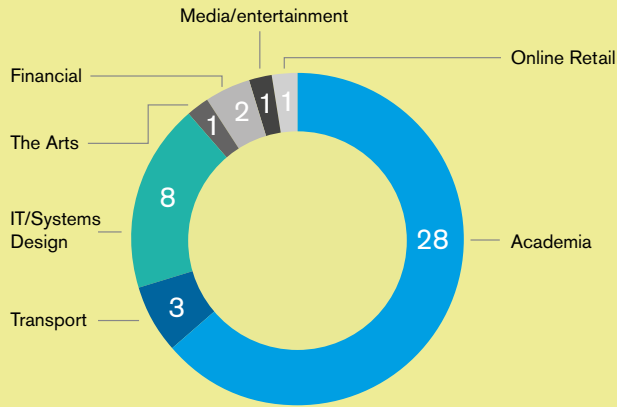
Our alumni – where are they now?

The Horizon CDT is very proud of the success it has achieved since its launch in 2009 and takes pride in the fact that graduates have left the CDT with not only a PhD, but with high-level doctoral skills, expertise, experience and knowledge to progress to professional careers around the world in a variety of sectors.

Employing organisation types of Horizon CDT graduates



Employing sectors of Horizon CDT graduates



Job titles of Horizon CDT alumni

Job title	No. of alumni
Assistant Professor	4
Auditor	1
Chancellors Fellow	1
Data Scientist	1
Digital Designer	1
Flight Deck & Human Factors Specialist	1
Founder/Co-Founder	8
Lecturer	1
Postdoctoral Researcher	5
Research Associate	7
Research Fellow	8
Senior Engineer	1
Senior Human Factors Engineer	1
Senior Lecturer	1
Senior Technical Consultant	2
Software Developer/Engineer	3
User Experience Researcher	4

Countries where Horizon CDT graduates are employed



Horizon CDT internships and employment destinations



Case Study: Entrepreneurism calls within the Horizon CDT

Martin Kruusimägi, Dr Daniel Ratzinger and Matthew Terrell (2011 cohort)



Call for Participants Co-Founders and 2011 cohort members Martin Kruusimägi, Matthew Terrell and Dr Daniel Ratzinger.



Some of our CDT students have gone on to launch and be involved in successful digital start-ups, both during and after their PhD study.

This was the case for 2011 cohort students Martin Kruusimägi, Daniel Ratzinger and Matthew Terrell, who co-founded and developed the online platform **Call for Participants** in 2012. This entrepreneurial move came about when they worked together to find new ways of communicating research participation opportunities to a wider public audience that went beyond the reach of existing networks. The idea originated from their participation in the 2012 Digital Economy Young Entrepreneurs Scheme competition.

This is a great example of how a CDT environment can nurture a high-level of entrepreneurial confidence, and allow three individuals with significant expertise

in product development, user experience, communications and technology to work together to develop a successful innovative enterprise.

Call for Participants collaborates with universities, charities, and education sector leaders internationally, and now has users **from over 176 countries**, involving researchers from over **30 universities worldwide** and **more than 30,000 research participations** now completed via the online platform.

Daniel completed the programme in August 2016 and Martin and Matthew submitted their PhD thesis in September 2016. They continue to act as mentors for current postgraduate students both inside and outside of the University.

“The CfP platform connects researchers with participants to improve the efficiency and accuracy of research trials.”



Case study: Moving on to Microsoft and a Chancellor's Fellowship Award

Dr Ewa Luger (2009 cohort)

Ewa Luger was a member of the first cohort of Horizon CDT students who started their PhD in Autumn 2009. The focus of Ewa's research was on reconfiguring consent around data privacy and systems design. She graduated with a PhD in July 2014 and, after working closely with her PhD supervisors and other researchers, secured a Research Associate post in the Mixed Reality Lab at the University of Nottingham.

In August 2012, Ewa was successful in gaining a postdoctoral researcher role within the Human Experience and Design Group at the Microsoft Research Lab in Cambridge, with a co-current Fellowship at Corpus Christi College at the University of Cambridge. In September 2016, Ewa was awarded a Chancellor's Fellowship at the University of Edinburgh to drive her own research agenda.



Left to right: Dr Rachel Jacobs, Dr Gilad Rosner and Dr Ewa Luger at their graduation in July 2014.

Case study: Ingenuity prize success for cross-cohort entrepreneurial team

Horia Maior (2012 cohort) and Pepita Stringer (2014 cohort)



Horizon CDT students Horia Maior and Pepita Stringer worked together with University of Nottingham MSc student and artist Lori Amor to enter the Nottingham University Business School Postgraduate Ingenuity Prize competition in 2015.

They were successful in reaching the final of this competition and were awarded entrepreneurial funding from Santander UK and local healthcare provider Nottingham CityCare to develop an innovative healthcare mobile device application, based on their business plan and pitch.

Case study: Collaborative research project with Games Workshop

Dimitrios Darzentas (2012 cohort)



In 2016, Dimitri Darzentas was successfully awarded a University of Nottingham EPSRC Impact Acceleration Award grant to fund a one-year research project to collaborate with Games Workshop, the world's largest manufacturer of tabletop wargames.

This project aims to accelerate and enhance the impact and outcomes of Dimitri's EPSRC-funded Horizon CDT research in the area of the digital footprints of physical objects.

Dimitri's approach of embedding sensors into wargaming miniatures to help participants capture and recall their digital histories is unusual and exciting, and has also attracted the attention of the National Videogame Arcade.

One of the project's objectives is to develop a demonstrator and deploy it at the NVA, providing an ideal route for deepening the dialogue with both partners, exploring future commercialisation opportunities and delivering public engagement.

Case study: Engineering the way to new careers in the transport industry

Dr Claudia Krehl (2009 cohort) and
Chrisminder Hare (2011 cohort)



Some of our first Horizon CDT graduates and CDT Director at the University of Nottingham ceremony in July 2014 (Dr Claudia Krehl far right).

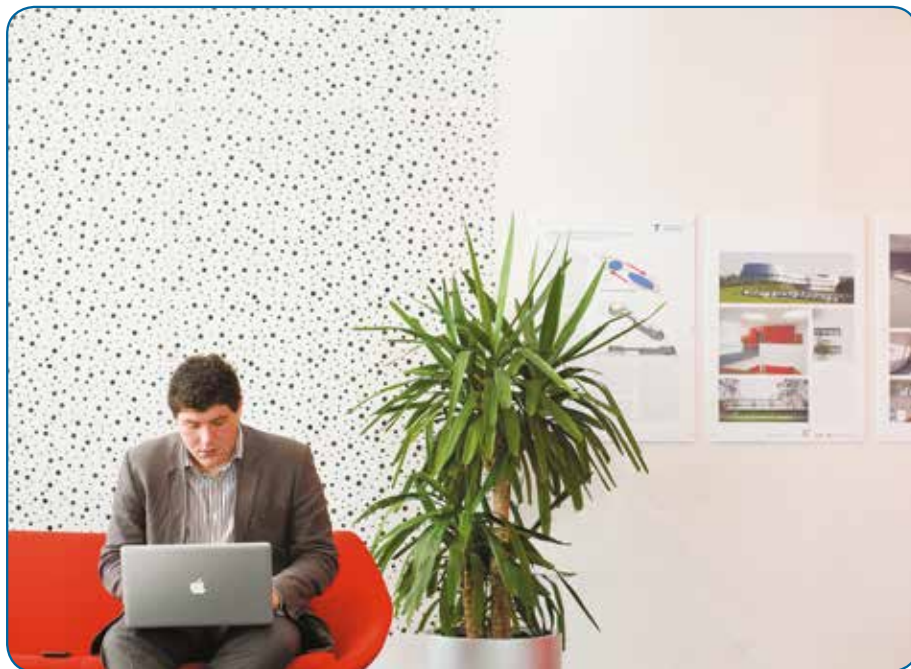


As a result of studying for a PhD within the Horizon CDT in the multidisciplinary areas of human factors, data science and technology within the Faculty of Engineering, Claudia and Chrisminder have moved on to specialist careers with globally recognised employers within the transport industry in the UK and Europe.

Claudia is now a Senior Human Factors Engineer at Jaguar Land Rover in Coventry and Chrisminder is working at the Airbus Group in Madrid as a Flight Deck Human Factors Specialist. Airbus also part-sponsored Chrisminder's PhD studentship with the Horizon CDT.

Case study: Mapping the need for Third World public services

Dr Mark Iliffe (2010 cohort)



After completing his Horizon CDT PhD in September 2015, Dr Mark Iliffe is now a Research Fellow and Geospatial Innovator in the Nottingham University Business School, as part of the Neodemographics Research Team.

Mark joined the CDT with a geospatial consulting background, together with prior experience of being in the Royal Navy.

His PhD research had a global reach and focussed on data mapping of communities in developing countries. In 2011 he completed his CDT internship with the World Bank, spending time in both the United States and Tanzania, leading the survey and data mapping of the informal development in the Tanzanian area of Tandale, Dar Es Salaam. The data collected from this fieldwork was utilised by local government, resulting in aided decision making in the deliverance of public services in this third world country.

The World Bank internship was completed in two parts, firstly on mission in Tanzania and Kenya during the Summer of 2011, followed up with time in Spring 2012 at the bank's headquarters in Washington DC.

Mark's work was also relevant to other countries in the region, including Uganda, Kenya, Zambia and Burundi, as part of the Living Labs and Southern Africa Innovation Support Programme.

During his PhD, Mark also developed a novel mobile phone sanitation app named Taarifa, designed to close citizen feedback loops and empower community users. The project won the international World Bank Sanitation Hackathon in May 2013, and received television coverage on BBC East Midlands Today in May 2014.

Case Study: Addressing data privacy and public policy for the Internet of Things

Dr Gilad Rosner (2009 cohort)



Gilad joined the Horizon CDT as a member of the first cohort in 2009, with prior industry experience as an Operations and Logistics Director in a globally-leading digital media company, and he completed a CDT internship as a Digital Identity Researcher at Experian.

His PhD research focussed on the intersection of public policy, privacy and digital identity and he graduated from the CDT in 2014 after successfully defending his thesis entitled 'Identity Management Policy and Unlinkability: A comparative case study of the US and Germany'.

Following his experience as a Horizon CDT candidate, Gilad went on to found the UK Internet of Things Privacy Forum in January 2015, which he set up to act as an effective interface between industry, regulators, academics, government and privacy advocates, in order to collectively discuss the privacy challenges inherent within the Internet of Things.

Gilad is also a member of the UK Cabinet Office Privacy and Consumer Advisory Group, the .uk Stakeholder Committee, and the British Computer Society Identity Assurance Working Group.

Now based in Barcelona, Gilad has appeared on live television on BBC World News on various occasions as an expert privacy researcher and advisor to the UK Government. He remains an active Horizon CDT alumni member and is a visiting researcher for the Horizon Digital Economy Research Institute at the University of Nottingham, as well as a Visiting Scholar for the Berkeley School of Information in California.

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