# New arrivals in UCLIC

In 2018 several of the previous cohorts of PhD students finished their studies, and some of them remained at UCLIC to continue their careers as research fellows. One was **Dr Giulia Barbareschi** who in December 2018 joined UCLIC and GDI Hub as a Research Fellow in Disability Innovation on the £20 million programme "AT2030 – Life Changing Assistive Technology for All" funded by the UK Department for International Development.



Before re-joining UCLIC after completion of her PhD on Disability and Assistive Technology, Giulia worked with the WHO on the development of an on-line module to support community health workers in low-resourced settings in providing basic assistive technologies to people with disabilities.

Her research focuses on understating how current and novel technologies are used to improve the lives of people with disabilities who live in the Global South.

Her work lies at the intersection of technology, disability and design with strong influences from disability studies and social development. As part of her work Giulia designs and implements studies with other universities, private institutions and NGOs to evaluate the impact of using different types of technologies, from mobile phones to prosthetics sockets, for people with disabilities who live in low-and-middle income countries.

Most of her current work under the AT2030 project is based in Kenya such as the clinical trial with the prosthetic company called Amparo GmbH that is investigating how the use of thermoplastic materials could revolutionise how lower limb prosthesis are made. Another example is the work with Motivation UK that is testing the use of Computer Aided Design and 3D printing to manufacture customised wheelchairs for people with disabilities.

Giulia is also interested in mobile technology and social systems, and her work on how people with visual impairment who live in informal settlements use their mobile phones to access their social support systems (and vice versa) will be presented at CHI2020.

In her spare time Giulia is also interested in education and computing and she works with Dr Enrico Costanza and Dr Catherine Holloway on the Tactile Inclusive Programming (TIP) – Toy project that aims to develop an open-source toolkit that would enable visually impaired children to learn basic programming concepts.

December 2018 saw the arrival of a new associate professor to UCLIC. **Dr Tim Adlam** is an engineer, designer and clinical scientist, and his work focuses on the creation of technology to enable disabled people to do what they want to do.

Tim has joined UCLIC from Designability, where he has worked for over 20 years creating diverse technology for disabled people, and where he still works for 1 day / week as principal engineer. Previously he has helped to create dynamic seating for children with complex motor disorders; mobility for preschool children; bikes for children with dwarfism; smart house systems for people with dementia; in-home assessment of older people's nutrition; robotics for frail older people; phantoms for calibrating tools for medical imaging technology and a low-cost fracture fixation device.

Tim is currently working on several research projects. PRIME-VR2 is a European H2020 project to create accessible virtual reality therapeutic environments for disabled people and people with sports injuries. Working with partners across Europe and within UCL Computer Science, Tim is leading the project's engagement with disabled people, ensuring that the design of accessible virtual reality games,

controllers and environments is based upon a solid understanding of the users' needs and preferences; and that the new solutions are developed with the people that will be using them.

Tim is also exploring the development of powered mobility for young children in Kenya. Children as young as 12 months need to be able to explore their physical and social worlds and make choices about what they want to do. This is important for their development socially and intellectually. Making powered mobility a reality for young children in the Global South is a complex task that requires innovation not just in wheelchair design, but also in-service design, manufacturing and logistics.

Tim is also running a programme of research into dynamic seating technology for children with complex dystonic cerebral palsy. Children learn to move by moving, and use their movement to learn new skills and about how the world works: Learn to Move - Move to Learn. For children with dystonia who experience whole body spasms throughout the day, having a seat that accommodates these powerful involuntary movements means that they can be more comfortable and have the opportunity to use their movement to develop new skills.

Tim is also part of the **Global Disability Innovation Hub** (GDI Hub), created as part of the legacy of the 2012 London Paralympics is a research and practice centre driving disability innovation for a fairer world. GDI works across five interactive domains: research, innovation, programmes, teaching and advocacy. Recently Tim led the GDI Hub's support for the **Smart Cities Hackathon in Egypt**, based at the National Academy for Information Technology for Persons with Disability (NAID). Tim and his colleague Ben Oldfrey helped to develop the hackathon curriculum, mentored twelve teams through an intense three day process of ideation, design, prototyping and business model development; and

judged the winning projects that will go on to be supported by the Egyptian 'Tamkeen' accelerator programme. Work like this helps to build capacity for effective disability innovation that can make a difference for many years to come.

Tim also has a passion for educating the next generation of problem solvers who will be helping to make better lives for disabled people. He is leading the new Disability, Design and Innovation MSc at UCL (MSc DDI). Partnering with Loughborough University London and the London College of Fashion, the MSc DDI is pioneering a new approach to disability innovation that equips its students with the skills and knowledge they need to solve complex entangled problems faced the by disabled people across the world. It takes a problem-focused multidisciplinary approach to design education, bringing together a team of experts in disability and innovation from GDI Hub at UCL, design thinking and problem solving from Loughborough; and business and marketing from the London College of Fashion. Students on the MSc have been supporting projects with UCLIC academics, including PRIME-VR2, and one will be presenting her work at the CHI 2020 conference.

Tim is a husband and the father of two children, one of whom is disabled and has taught him much about what is important. He loves to sing and play music, and canoes on local waterways near his home in Wiltshire.

**www.disabilityinnovation.com**
Email: **t.adlam@ucl.ac.uk**

Tim helps these charities to make life better for disabled people; perhaps you could too!

Designability Charity:
**www.designability.org.uk**

Stepping Stones District Specialist Centre for disabled children:
**www.steppingstonestrowbridge.co.uk/home.html**

# New arrivals in UCLIC cont.

**Youngjun Cho** is a lecturer in Global Disability Innovation. He explores, builds and evaluates novel techniques and technologies for the next generation of Artificial Intelligence-powered physiological computing to boost disability technology innovation. He obtained a PhD from UCLIC!

Before returning to academia, he worked as a specialist in machine learning for human-computer interaction at LG Electronics (full-time: 2011–2015, leave of absence: 2015–2018). He led a wide range of industrial research projects and successfully commercialized his novel interaction interfaces and sensing technologies. An example is Advanced Touchscreen with in-air gesture control which is equipped in Porsche Panamera cars.

His current research focuses on designing physiological computing technology that can sense our bodily functions, psychological needs and provide intervention. In particular, he has pioneered mobile, low-cost imaging for physiological sensing and mental stress monitoring. In a recent project funded by Bentley, he and Nadia Berthouze's team have been exploring human comfort through physiological monitoring. Also, his team has been investigating physiological computing as a research tool to understand the barriers that disabled people face in the real world.

Youngjun is actively involved in innovation, enterprise and commercialization activity. He is a co-founder of a UCL spin-out company (KIT-AR) which has resulted from the EC Horizon 2020 HuMan project and has contributed to the creation of new jobs in Artificial Intelligence and Augmented Reality.

Also, he enjoys teaching which he believes is a process of active and collaborative learning. In 2019/20, he has been supervising more than ten UG/MSc students.
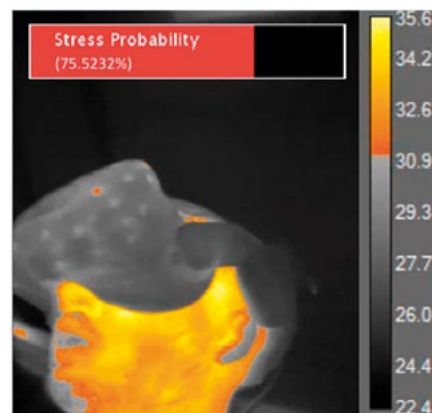
To get to know more about Youngjun, please check out: **uclic.ucl.ac.uk/people/youngjun-cho** and **www.disabilityinnovation.com/about/team/youngjun-cho**
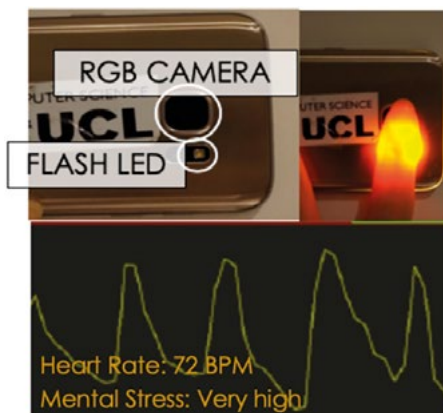
*Heart Rate and Stress monitoring using a smartphone camera*

*Understanding VR accessibility for people with dyspraxia through thermal imaging*

**Aneesha Singh** joined UCLIC as a Lecturer in September 2018. Prior to this she was a postdoctoral fellow in UCLIC.



Aneesha received her PhD at UCLIC in Human Computer Interaction and her MSc in Evolutionary and Adaptive Systems from the University of Sussex. Before that she has worked in industry in various roles as a software consultant, analyst and project leader, and as a technical journalist.

Aneesha's research focuses on how ubiquitous, pervasive and IoT technologies for health and wellbeing can be designed to fit in with everyday contexts of daily life, work and play and in how people's understanding of themselves can be augmented and enriched through interactive technologies. She uses qualitative and mixed methods and prototypes to investigate technology use in the wild. Her research projects have so far focused on diverse conditions such as rehabilitation and self-management of physical activity in chronic pain, autism, HIV and body image disorders. In her studies with people with chronic pain, she focused on the problem of increasing physical activity despite emotional barriers faced by people and created novel technology and frameworks to address the problem. The insights, frameworks and technologies from these studies have been extended to different populations and technologies.

Her research typically follows a highly collaborative and inter-disciplinary approach to technology design that places end-user participation and evaluation at its core. She is passionate about designing technologies for inclusion that can positively transform people's social and emotional lives; a large amount of her research examines the practical and ethical dimensions of conducting participatory design (and participatory research in general) with people, especially in sensitive contexts and with people with heightened vulnerabilities. Therefore, she has an ongoing interest in understanding the methods and techniques used for involving people in design and research processes.

Currently she is working on using digital technologies to support adolescents in exploring their own self-identities to promote resilience and wellbeing. She is also interested in the use of technology to facilitate the building of empathy through sharing information about people's conditions, especially for invisible, sensitive and stigmatised conditions.

# Movers and Shakers

## Interaction Design: Beyond Human-Computer Interaction now in its fifth edition

The fifth edition of Yvonne Rogers co-authored textbook with Helen Sharp and Jenny Preece came out in 2019. It was launched at our book party during the CHI'19 conference. This time we chose a lime green cover that is as striking as the last orange one! The textbook has had a major revision, including adding a new chapter on 'data at scale' that covers key methods for collecting and analysing HCI big data, data visualisation tools and techniques, and ethical design concerns that the new ways of collecting and analysing data raises, especially personal data. The website was also updated with many new resources, including talking heads and updated slides: **www.id-book.com**



Photo by Ben Shneiderman

*Yvonne Rogers (centre), Helen Sharp (right) and Jenny Preece (left) sign copies of their book.*

Our foray into creating an ebook version turned out to be disappointing as it never really took off. So we did not update that. Instead, the paper version continues to be the textbook of choice worldwide, having now sold well over 250,000 copies. It seems students still prefer having a physical book in their hands.
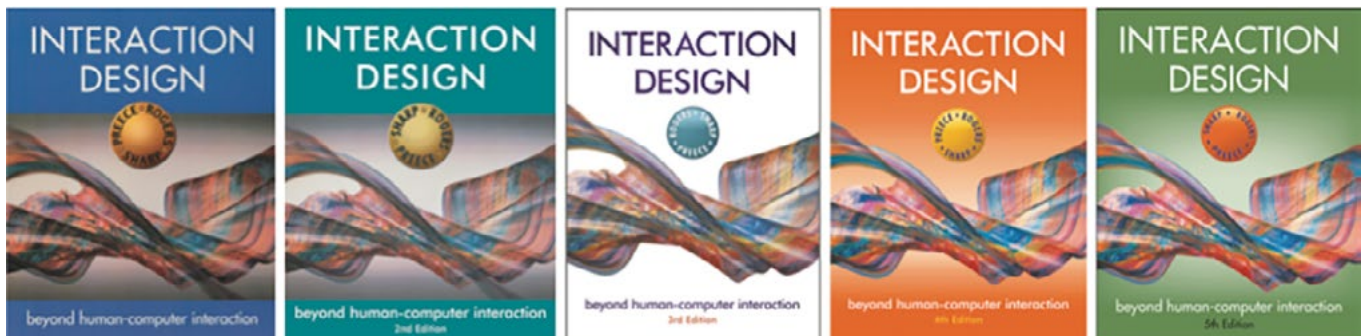
## How a game of Tetris is a better stress buster than mindfulness

UCLIC research has shown that people who played 10 minutes of Tetris felt more relaxed than after using popular Mindfulness techniques. A second experiment found that playing a computer game after completing a strenuous task solving mathematical equations left people feeling less tired than using popular Mindfulness apps. Anna Cox said: 'We need to stop making people feel bad about playing games on their smartphones because they can really help people detach'. The story was picked by 109 news outlets (**https://tinyurl.com/rpq7kfm**) including an article in UK newspaper the Daily Mail (**https://tinyurl.com/y2ymhz2r**). An open access version of the paper is also available: **https://tinyurl.com/slclzfr**
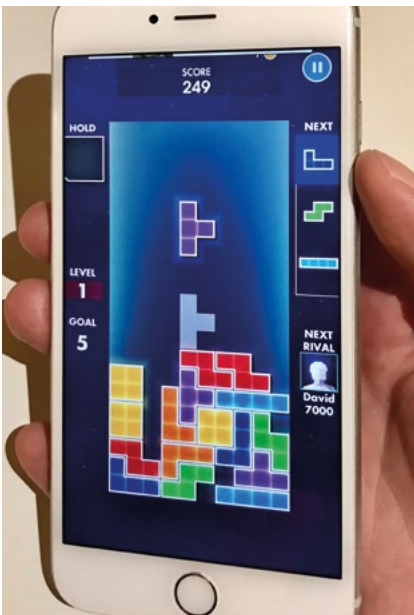
## Dark mode is not as good for your eyes as you believe

Researchers Ana Cox and Aneesha Singh explained the benefits and drawbacks of Dark Display Mode on mobile phones and tablets in an article in Wired (**https://tinyurl.com/y6l9hmjr**). They evaluated questions such as '*Does dark mode really help eyestrain*?' and '*Does it make text more legible?*' It is a very interesting and insightful read!
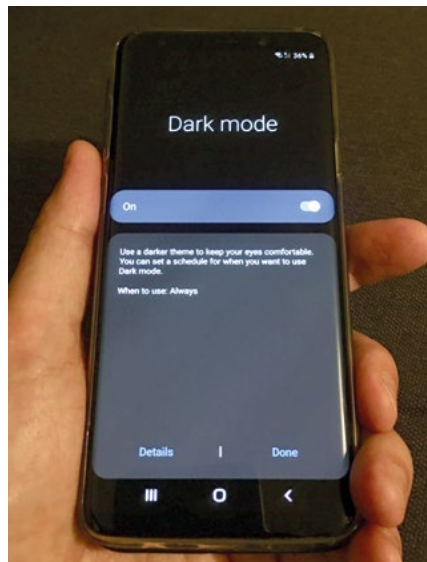
## Prof Anna Cox appointed as specialist advisor to the DCMS select committee at the House of Commons

Anna Cox was appointed as Specialist Advisor to the DCMS Select Committee at the House of Commons for the inquiry into Immersive and Addictive Technologies. The inquiry examined the development of immersive technologies such as virtual and augmented reality, and the potential impact these could have in the worlds of sport, entertainment and news. The inquiry also looked at how the addictive nature of some technologies can affect users' engagement with gaming and social media, particularly amongst younger people. The report was published in September 2019 (**https://tinyurl.com/y2cbrefk**).

# Movers and Shakers cont.

## Bremen Excellence Chair

Yvonne Rogers was awarded an Excellence Chair from Bremen University that runs from 2020–2025. It provides a grant of 720,000 euros and is awarded to only eight "outstanding experts in their disciplines that represent bridgeheads for collaboration with leading institutions worldwide". The chair is intended to enable collaborative projects to be fostered with researchers at UCLIC. As part of this initiative Yvonne will build up a team to compliment her projects running at UCLIC, exploring how personal data when combined with AI techniques can be used, from a human-centered perspective, to improve the quality of healthcare. Areas that can benefit from this synergy include clinical decision support, disease surveillance, and population health management. Discovering new associations and understanding patterns and trends within the burgeoning health data also has much potential to improve care. The aim is to enable healthcare providers to be better informed and develop more thorough and insightful diagnoses and treatments.



For example, designing new interfaces for visualizing health data that can better elucidate what is behind the numbers; supporting clinicians in being able to detect vulnerabilities within patient populations during disease outbreaks.

The trans-European team will develop new multimodal interfaces (voice, agents and GUIs) by transforming how data is understood and acted upon by clinicians and patients, through combining a novel form of human-computer interaction (HCI) with artificial intelligence (AI).

The goal is to firstly, make health data more accessible, by developing a natural form of data-interaction, and, secondly, amplifying human cognition to enable clinicians to make better decisions.This will entail building a voice interface as a front end to enable users to explore and interact with visual data analytic tools and data visualisations, together with modelling certain aspects of human conversation and data analytic strategies, using AI and machine learning algorithms.