

UCL INTERACTION CENTRE
DIVISION OF PSYCHOLOGY AND LANGUAGE SCIENCES
AND DEPARTMENT OF COMPUTER SCIENCE



UCL

UCLIC NEWS 2022

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The front cover of this year's *UCLIC News* shows an artwork representing the interior of a beehive, a perfect example of a complex system. It was originally created as a visual tribute to Britain's honeybees by UK-based artist Wolfgang Buttress for the UK Pavilion at the 2015 Milan Expo, and is now housed at Kew Gardens (<https://www.kew.org/kew-gardens/whats-in-the-gardens/the-hive>).

Many thanks to photographer Sarah Abdi.

UCLIC NEWS 2022

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Editorial

Welcome to our UCLIC newsletter for 2022



It is our 21st birthday this year and to celebrate this occasion we have a series of events planned, several of which we welcome our alumni and former staff to attend. These include a PhD showcase, a belated Christmas dinner, an inaugural lecture by Professor Duncan Brumby and a summer party. We plan to hold these events in person. This will enable us to all reconnect as well as provide our new students with great opportunities to network and schmooze. Since our last newsletter, we have grown again, welcoming three new academic staff members and their postdocs and PhD students. These are Sri Subramanian, Marianna Obrist and Diego Martinez Plasencia. They have formed the research group [Multi-Sensory Devices \(www.ucl.ac.uk/computer-science/research/research-groups/multi-sensory-devices\)](http://www.ucl.ac.uk/computer-science/research/research-groups/multi-sensory-devices). As part of our continued expansion, we have also recently appointed a new administrator, Giovanna Ceroni, to help Louise and Jo look after our comms and media.

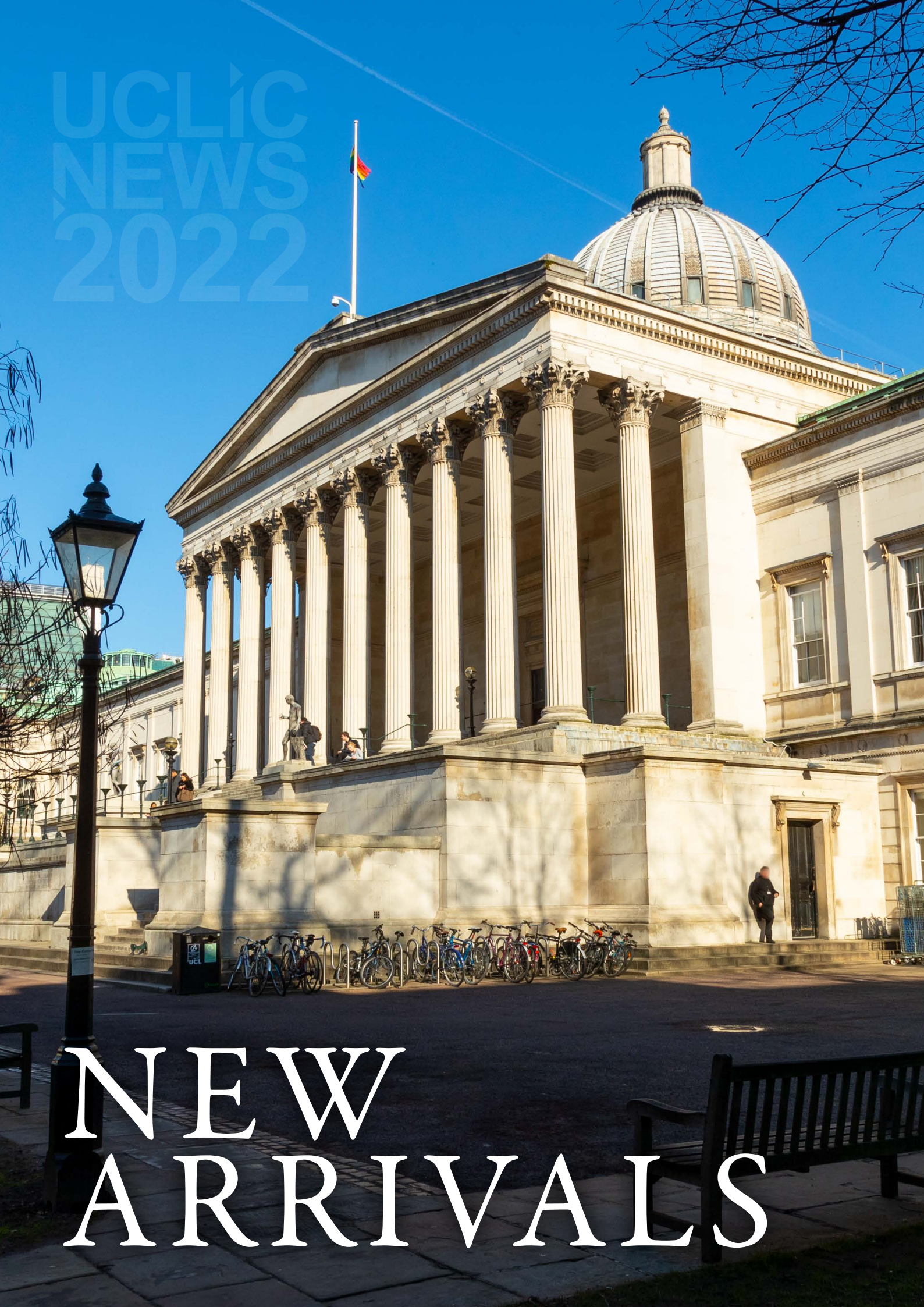
We have managed to survive and even thrive through the two-year-long Pandemic, finding new ways of sustained working at home, teaching online, while pivoting our research so it could be done remotely. Many of our PhD students, however, have found it challenging to have to change their research agenda mid-course, but they have managed. It has been a joy to see how they have helped each other out and dug deep to keep going, despite being deprived of

the many usual activities associated with being a PhD student. Several are now on the home stretch writing up. Meanwhile, our HCI programme continues to be very healthy with a record number of students registered for the academic year 2020-2021. That year the cohort ended up being taught largely online. It was a lot of extra work for us, adapting our teaching methods to accommodate their different needs, timetabling classes so that those who remained in their home countries, as far away as California and Beijing, could attend. But it was well worth it.

Many of us have been successful in obtaining grants that have allowed us to continue working with others in a variety of areas, including health, wellbeing, comfort, humane AI, and digital innovations and technology – some of these we highlight in the newsletter. In terms of gongs, Ann Blandford became a recipient of the prestigious IFIP TC13 Pioneer in Human Computer Interaction Awards and in the same week learned she had been elected to the ACM CHI Academy in 2021! Meanwhile, I received a MRC Suffrage and Science Award in 2020 for being one of the leading women in Mathematics and Computing and then this year will be awarded the Royal Society's Robin Milner Medal and Lecture for contributions to Human-Computer Interaction and the design of human-centred computing. Finally, I am delighted to congratulate Cathy Holloway for her promotion to Professor in 2021. The corks have been popping!

Yvonne Rogers
UCLIC Director

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NEW
ARRIVALS

MSD (Multi-Sensory Devices) group: Making the impossible possible

Professor Sriram Subramanian, Professor Marianna Obrist and Dr Diego Martinez Plasencia joined UCLIC in the summer of 2020 to form the **MSD (Multi-Sensory Devices) group.**

The group's research programme focuses on creating new forms of interactive multi-sensory user experiences through the development and exploitation of novel sensor and actuator technology. The core team comprises PhD students and postdoctoral researchers from various backgrounds, including physics, communication sciences, psychology, computer graphics and computer engineering.

The MSD group has also developed a new Master's programme on Sensor Systems. You can read more on page 25.

Examples of current work include:

- The use of acoustic phased arrays and metamaterials for creating acoustophoretic volumetric displays. These displays enable multimodal interactions combining visual, haptic and audio experiences.
- Novel olfactory interfaces and gustatory delivery devices that are used to explore immersive scent and taste experiences in a range of usage scenarios, from entertainment to healthcare applications.
- Reconfigurable sound modulators that transform an incident audio field into any diffraction-limited acoustic field. The group's principal approach to creating sound modulators is through the systematic exploration of reconfigurable acoustic

metamaterials – an emerging class of engineered materials designed to control, direct, and manipulate audible and ultrasonic waves.

“We are a full-stack research group combining physical and social sciences with prototyping, electronic control, computational fabrication, perceptual research, and experience design and we aspire to bring our expertise both in academia and industry to turn UCLIC and UCL into a world-leading powerhouse on Human-Computer Interaction and deep-tech innovation.”



Professor Subramanian holds a Royal Academy of Engineering Chair in Emerging Technologies on novel interactive systems. His Chair and ERC Advanced Grant are on the design and fabrication of new types of sound modulators with a specific emphasis on creating innovative displays, haptics and audio devices. One example of such innovation is the use of several hundreds of tiny ultrasonic speakers to create the sense of touch through air. This work led to the formation of **Ultraleap** (www.ultraleap.com) (formerly Ultrahaptics), a Bristol-based haptics company that recently acquired Leap Motion to create one of the largest spatial interaction companies in the world.



Professor Obrist's research focuses on multisensory experiences around touch, taste and smell. Her ERC starting grant enabled her to build new sensory devices and interfaces and establish a better understanding of single and multi-sensory stimulation in a variety of application scenarios. One example of this is Tree VR, a multisensory VR experience, designed by New Reality in New York and exhibited at the World Economic Forum (WEF) in Davos (2019 and 2020), using MSD's novel digital smell technology. This technology is now commercialised through **OWidgets** (<https://ow-smelldigital.com>), a university spin-out, supported both by ERC PoC awards and the RAEng Enterprise Hub fellowship. Most recently, Professor Obrist published *Multisensory Experiences: Where The Senses Meet Technology*, a comprehensive introduction to the dynamic world of multisensory experiences and design (see page 14 for details).



Dr Diego Martinez Plasencia is an associate professor at UCL, aiming to create multi-modal interactive systems that allow users to see, hear and feel virtual 3D content in a seamless manner, without any attachments or additional devices (e.g. glasses, gloves). His research involves a combination of 3D display approaches, HCI and applied physics to enable interactive systems, such as multi-view tabletop systems or multi-modal particle-based displays (PBDs). His work has been demonstrated at international forums, such as the Festival della Scienza and the Founders Forum, and received extensive media coverage on ITV, CNN, Discovery Channel, BBC Click and Sky News. Before joining UCL, he was a lecturer at the University of Sussex, a research associate at the University of Bristol and an assistant lecturer at the University of Castilla–La Mancha (UCLM).

UCLIC Highlighted Profiles



Dr Daniel Hajas joined UCLIC in November 2021, as an Innovation Manager. Daniel is a blind individual, with a physics degree and PhD in Informatics from the University of Sussex. He has experience in entrepreneurship as the co-founder and CEO of a student start-up company, working on accessible STEM education. In his new role, Daniel is working closely with Professor Catherine Holloway and the GDI Hub on disability innovation.

Daniel was born in Hungary, he moved to England in 2013, and also lived eight years in Croatia. Now Daniel lives in Brighton with his guide dog, Anna. Outside of work, Daniel enjoys cooking and hosting dinner parties. In quieter times, he likes to read books on a wide range of topics, from the history of religion, through economics, all the way to Bitcoins and cyber security. Yet, LEGO remains a life-long passion for Daniel.

<https://www.disabilityinnovation.com/who-we-are/our-team/daniel-hajas>



Jon Mella is a first-year PhD student supervised by Professor Anna Cox and Dr Jo Iacovides. His PhD research focuses on the use of digital games to promote recovery from daily work stress. He attained a BSc and MSc in Psychology, both from the University of Birmingham, between 2014 and 2018. Jon combines his research with working as a Lead Demonstrator in the BSc Psychology Programme, in which he supports with the delivery of a first-year module 'Introduction to Psychological Experimentation'.



Giovanna Ceroni is the Communications & Administration Officer at UCLIC, working closely with Dr Louise Gaynor, the Centre Manager, to develop and implement UCLIC's comms strategy. She is responsible for creating content and managing the UCLIC website and social media channels, ensuring that comms are harmonised and underpinned by effective and user-led principles. Giovanna is also the go-to person for events organisation and PPIE activities. She has a strong interest in increasing research impact and has in-depth knowledge of Open Access policies. Before joining UCL Giovanna worked in publishing as a Senior Medical Editor and was a project manager with the World Health Organization Regional Office for Europe, The Cochrane Collaboration and the London School of Hygiene & Tropical Medicine. In her spare time, Giovanna is a keen street photographer, enjoys running, cycling and playing tennis, and loves cooking. Giovanna practices meditation on a daily basis.



Dr Sarah Abdi is an interdisciplinary researcher and a healthcare professional, who combines more than 14 years of experience in academia, clinical practice and industry. Sarah joined UCLIC in August 2021 as a research fellow to work on the HERMES project. Her research in this project involves working closely with ophthalmologists, community optometrists and patients to explore factors that may influence real-life implementation of two innovative digital technologies (Tele-ophthalmology and the Moorfields-DeepMind AI) in the context of referrals between primary and secondary eye care. Sarah completed her PhD at the University of Sheffield; her research focused on exploring the potential of emerging digital technologies, such as AI & robotics, to meet the health and social care needs of older people living at home with long-term conditions. Sarah's research also included collaborating with renowned international organisations, including the World Health Organization and the World Intellectual Property Organization. Before joining UCLIC, Sarah worked as a researcher on several user-centred design projects at the University of Sheffield. Sarah also worked as a dietician in clinical and commercial settings and planned hundreds of specialised therapeutic diets and lifestyle plans to patients with type 1 & type 2 diabetes as well as other chronic conditions.



Inaugural Lecture: Professor Duncan Brumby

Professor Duncan Brumby will be giving his inaugural lecture on 22 June 2022. He will explore the topic of 'Digital Distraction'. Our daily activities are constantly punctuated by interruptions, and maintaining focus can be challenging. Professor Brumby will discuss the results of his and other colleagues' research aimed at understanding how people multitask and manage digital distractions. To investigate this question different research methods and approaches have been used, from controlled lab experiments, to situated observational studies, and online studies with crowdsourcing platforms. The results of this research give insights into how people can better manage digital interruptions, and how systems can be better designed to help people maintain focus.

MOVERS AND SHAKERS



Celebrating our achievements

The Global Disability Innovation Hub (GDI Hub) was awarded the status of World Health Organization (WHO) Official Collaborating Centre on Assistive Technology (AT).



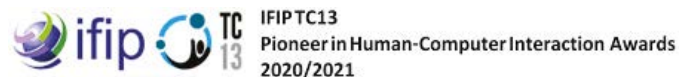
World Health Organization

A first of its kind, and led by Professor Cathy Holloway, GDI Hub's Academic Director, the WHO Collaborating Centre will focus on driving global disability innovation to work towards a fairer world through access to assistive and accessible technology. The team will also contribute to the 2022 WHO/UNICEF World Report on Assistive Technology, highlighting the current need, demand and supply of assistive technology, as well as outlining good practices for innovation and recommendations to improve access.

GDI Hub was selected because of its global expertise in AT and its track record of supporting four million people with disabilities in 35 countries over the last two years to access AT. GDI Hub grew out of the bold approach to disability inclusion taken during the London 2012 Olympic and Paralympic Games. It was launched to build on this legacy and empower local communities through innovative design and engineering, working with business partners based in the Queen Elizabeth Olympic Park, including the London College of Fashion and Loughborough University London.

Professor Ann Blandford was the recipient of the prestigious IFIP TC13 Pioneer Award 2020/2021.

The International Federation for Information Processing Technical Committee on Human-Computer Interaction (IFIP TC13) Pioneers are appointed by virtue of their outstanding contributions to the educational, theoretical, technical, commercial or professional aspects of analysis, design, construction, evaluation and use of interactive systems.



Professor Blandford was also elected to the SIGCHI Academy, an honorary group of individuals who have made substantial contributions to the field of human-computer interaction. SIGCHI is the premier international society for professionals, academics and students who are interested in human-technology and human-computer interaction.



Professor Yvonne Rogers was among the 11 recipients of the Suffrage Science Award for Mathematics and Computing 2020, celebrating the achievements of women in STEM.

Over one hundred years after women in Britain won the right to vote, women still make up only 24% of those working in core science, technology, engineering and mathematics occupations in the UK. Recent data have revealed that women make up just 13% of students studying computer science or related university courses in the UK. The Suffrage Science awards scheme, curated by the MRC London Institute of Medical Sciences, celebrates women in STEM subjects, and encourages others to enter scientific fields and reach senior leadership roles.

The awards themselves (a brooch and a bangle) are hand-crafted items of jewellery created by art students from Central Saint Martins-UAL, who worked with scientists to design pieces inspired by research and by the Suffragette movement, from which the award scheme takes its name.

Pattern of Thought by Veronika Fábíán



Made from gold punched tape, the brooch reflects the fields of maths and computing. Punctured tape was used by computer scientists to send text-based messages, and later for storing data. The brooch is an elegant piece with a powerful message, decoding the series of holes on the brooch reveals sentences from three Suffragette banners; 'Deeds not words', 'Courage Constancy Success' and 'Through thick & thin we n'er give in.

Professor Rogers also received the Royal Society's Milner Award and Lecture for contributions to Human-Computer Interaction and the design of human-centred technology. The Milner is the premier European award for outstanding achievement in computer science.

STOP PRESS: Professor Rogers has been awarded the prestigious SIGCHI Lifetime Research Award 2022. The Lifetime Award was conferred on Professor Rogers to recognise her critical stance towards how visions, theories and frameworks shape the fields of HCI, cognitive science and ubiquitous computing; her impact in promulgating new theories (e.g., external cognition), alternative methodologies (e.g. in the wild studies) and far-reaching research agendas (e.g. 'Being Human' manifesto), and her pioneer approaches to innovation and ubiquitous learning.

The Association for Computing Machinery (ACM) named Professor Sriram Subramanian as one of 63 Distinguished Members for 2021. The Distinguished Members grade recognises ACM members who have at least 15 years of professional experience, five years of professional membership in the last 10 years and have achieved significant accomplishments or made an impact in the computing field.

Professor Subramanian was selected by his peers for his considerable achievements in new forms of devices that enhance human-computer interaction through the creation of mid-air haptic feedback devices and 3D displays using acoustic levitation.

Professor Anna Cox was one of the three winners of the Provost's Award for Embedding Equality, Diversity, and Inclusion 2021.

This award recognises an individual's or team's effort to embed EDI into mainstream work through their approach and undertaking of tasks, be it day-to-day tasks or larger projects.



UCLIC PhD student Maryam Bandukda was awarded a Beacon Bursary award for her project 'Co-creating artful representations of blind people's experience at the Queen Elizabeth Olympic Park'.

The bursaries are a competitive funding round, which aims to advance the practice and culture of public and community engagement within UCL.

Professor Catherine Holloway, Academic Director GDI Hub, and PhD student Maryam Bandukda were awarded the EPSRC Public Engagement for ICT grant.

Their funded project 'Inclusive Public Activities for Information and Communication Technologies (IN-PACT)' is a public engagement initiative to promote ICT research and to strengthen researcher-public collaborations, particularly with disabled people in ICT research and innovation. The project aims to attract young disabled people to STEM careers in the UK, foster new interaction mechanisms for disability-inclusive exchanges, and inspire through a podcast series and public wonder events.

HCI MSc student Emma Holliday received an honourable mention in the CHI PLAY student game design competition 2021 for work she conducted as part of the Serious and Persuasive Games module.

During his Doctorate, which he completed in July 2020, former UCLIC PhD student Akhil Mathur was selected for the ACM Future of Computing Academy membership (2019-2021).

PhD student Josie Carmichael was selected for the Dean's list for the MRes CDT i4Health.

Every year the Dean of the Faculty of Engineering Sciences recognises the top-performing students, in terms of academic performance, from across the Faculty. These are typically the top 5% performing students. Josie was also selected to receive the Association for Research in Vision and Ophthalmology (ARVO) International Travel Grant to present her research at their conference in Denver, USA, in May 2022.

Congratulations to three UCLIC PhD Students who completed their doctorates during 2020:

Mark Warner with a doctoral thesis on 'Signalling and Unravelling: (Non)Disclosure of HIV Status Information in Sex-Social Apps Used by Men Who Have Sex With Men'

Amid Ayobi with a doctoral thesis on 'Self-Tracking by People Living with Multiple Sclerosis: Supporting Experiences of Agency in a Chronic Neurological Condition'

Akhil Mathur with a doctoral thesis on 'Scaling Machine Learning Systems Using Domain Adaptation'

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IN THE
MEDIA





New book by Catherine Holloway and Giulia Barbareschi (UCLIC and GDI Hub)

Disability interactions (DIX) is a new approach to combining cross-disciplinary methods and theories from Human Computer Interaction (HCI), disability studies, assistive technology and social development to co-create new technologies, experiences and ways of working with disabled people. It focuses on the interactions people have with their technologies and the interactions which result because of technology use.

A central theme of the approach is to tackle complex issues where disability problems are part of a system that does not have a simple solution. DIX pushes researchers and practitioners to take a challenge-based approach, which enables both applied and basic research to happen alongside one another.

Holloway C, Barbareschi G. *Disability Interactions: Creating Inclusive Innovations Synthesis Lectures on Human-Centered Informatics*. Williston (VT), USA: Morgan & Claypool Publishers, 2021. http://www.morganclaypoolpublishers.com/catalog_Orig/product_info.php?cPath=&products_id=1690

Launch of eWorkLife Podcast Series hosted by Professor Anna Cox

The eWorkLife podcast series offers long-form conversations with academics, scientists and thought leaders, on how technology can help and hinder us in managing our work and wellbeing. These conversations tell personal stories of career journeys that demonstrate a common theme of just how unplanned an academic career often is, including failures, as well as successes.



Invited guests describe the roots of their research interests, how these have evolved and what inspires their work today. Each podcast also explores the insights they have gained into the design and use of technology, both

to gather data and to create interventions. In addition, some practical hints and tips are included about how we can take control of our digital technology to thrive.

Recent guests have included: Professor Ann Blandford, Paulina Bondaronek, Dave Cook, Dr David Ellis, Dr Conor Linehan, Joe Newbold and Dr Kathy Stawarz.

The podcast series is available on SoundCloud, Spotify, Google and Apple podcasts.

<https://www.eworklife.co.uk/podcast>

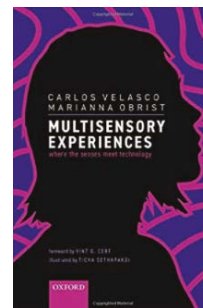
Virtual living?

In March 2021 the *Times Higher Education* published 'Life beyond Zoom and Teams: students are ready for next gen online spaces', an article by Professors Yvonne Rogers and Paola Lettieri, and Ben Meunier, Director of Operations at UCL Library Services.

THE Campus

Underpinned by research findings, the article explores the opportunities, benefits and challenges of creating a new generation of virtual worlds that can provide a 24/7 presence for students to inhabit and adapt to their wants and needs, as we look forward to a post-pandemic world.

Read more: <https://www.timeshighereducation.com/campus/life-beyond-zoom-and-teams-students-are-ready-next-gen-online-spaces>



New book published

In October 2020, Oxford University Press published *Multisensory Experiences: Where The Senses Meet Technology*, by Dr Carlos Velasco, Associate Professor, BI Norwegian Business School, and UCLIC Professor Marianna Obrist.

Most of our everyday life experiences are multisensory in nature. In recent years, many of these experiences have been increasingly transformed and capitalised on through advancements that adapt the world around us – through technology, products, and services – to suit our ever more computerised environment.

Through a journey that marries science and practice, the authors look at current trends and offer a comprehensive

introduction to the dynamic world of multisensory experiences and design. They review the fundamentals of multisensory experiences, through the relationship between the senses and technology, and explore what the future of those experiences may look like, and our responsibility in it.

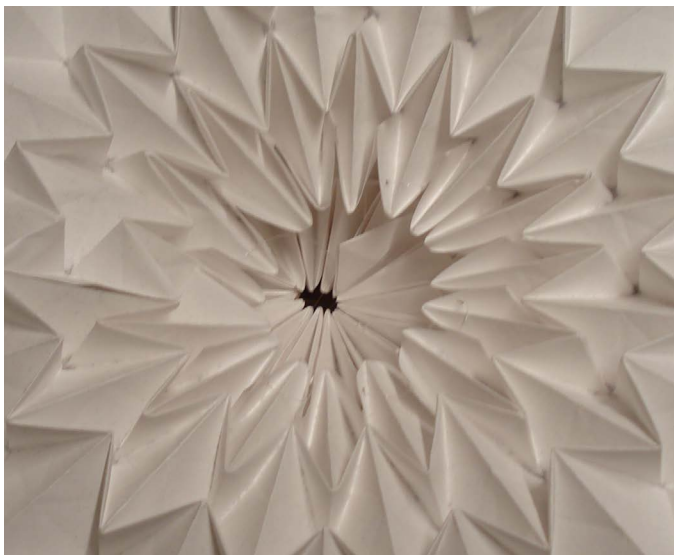
Velasco C, Obrist M. *Multisensory experiences: Where the senses meet technology*. Oxford: Oxford University Press, 2020. <https://global.oup.com/academic/product/multisensory-experiences-9780198849629?lang=en&cc=bw>

Honourable Mention @CSCW 2020



'To plan or not to plan? A mixed-methods diary study examining when, how and why knowledge work planning is inaccurate' by UCLIC authors Ahmetoglu, Brumby and Cox received an honourable mention at the 23rd ACM Conference on Computer-Supported Cooperative Work and Social Computing.

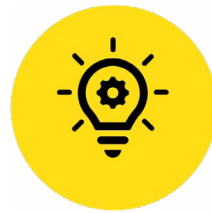
Read the paper: Ahmetoglu Y, Brumby DP, Cox AL. To plan or not to plan? A mixed-methods diary study examining when, how and why knowledge work planning is inaccurate. In: *Proceedings of the ACM on Human-Computer Interaction* 2020: 4, CSCW3, Article 222, 20 pages. <https://dl.acm.org/doi/10.1145/3432921>



Telehealth in time of a pandemic

Professor Ann Blandford was an advisor to the Riyadh Global Digital Health Summit 2020 (<https://rgdhs2020.com/>), a pre-meeting for the G20 Summit in Saudi Arabia that year, and lead author on 'Opportunities and challenges for telehealth within, and beyond, a pandemic', one of the scientific publications linked with that meeting. The paper was published in *The Lancet Global Health*.

Read the paper: Blandford A, Wesson J, Amalberti R, AlHazme R, Allwihan R. Opportunities and challenges for telehealth within, and beyond, a pandemic. *Lancet Glob Health* 2020 Nov;8(11):e1364-e1365. Epub 2020 Aug 10. <https://www.sciencedirect.com/science/article/pii/S2214109X20303624?via%3Dihub>



New podcast series: Innovation Action Insights

Many of the innovations which shape our lives and the world we live in are developed by designers and engineers working behind closed doors. But what happens when researchers and innovators work together to develop open-source solutions to address some of the greatest challenges of our time? Hosted and produced by Dr Giulia Barbareschi and with a technical commentary by Dr Ben Oldfrey, Innovation Action Insights features interviews and stories from the brains behind the disruptive and cutting-edge innovations aiming to impact the lives of millions of people living in different areas of the world.

Funded by UK Aid COVIDAction and AT2030 through the Innovation Action collaborative initiative led by the Global Disability Innovation Hub, the podcast is a 5-part series, with episodes released every two weeks. It is hosted on SoundCloud and is also available on Spotify.

<https://www.innovationaction.org/podcasts>

A close-up photograph of a person's hand holding a white, prosthetic hand. The prosthetic is made of a smooth, white plastic material and has several joints and a small button. The background is dark and out of focus, featuring several bright, colorful lights in shades of green, blue, and purple. The overall scene suggests a focus on technology and human innovation.

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NEW
GRANTS
AND
INITIATIVES

Making an impact in clinical practice

Health and wellbeing are important application areas for HCI research. But to make a meaningful difference in clinical practice, it's essential to work in multi-disciplinary teams, with health professionals, engineers, and often entrepreneurs and patient representatives. So in the past couple of years Professor Ann Blandford has focused efforts on being the HCI lead on projects where the Chief Investigator is a clinician: someone with a vision of how interactive technologies can improve clinical practice and patient experience, and who recognizes the added value of HCI in making that happen. Ongoing projects cover a rich variety of clinical specialisms and conditions.

Roos van Greevenbroek has returned to UCL (having completed the MSc in HCI previously) to work on [SEQUENCE-Digital](https://www.sequencedigital.org.uk) (<https://www.sequencedigital.org.uk>). The aim of this project is to establish a digital care pathway for managing chlamydia treatment, building on an existing design concept but ensuring that it is usable (and welcomed) by people with chlamydia and their sex partners while also being digitally secure, clinically safe, accessible to as many people as possible, and scalable to diverse healthcare providers. HCI pervades the project, from questions of how to respect some people's desire for anonymity while enabling them to be accurately identified on minimal information to questions of how to design sensitively for people whose biological sex and gender identity differ. A clinical trial of the system is planned for next year.

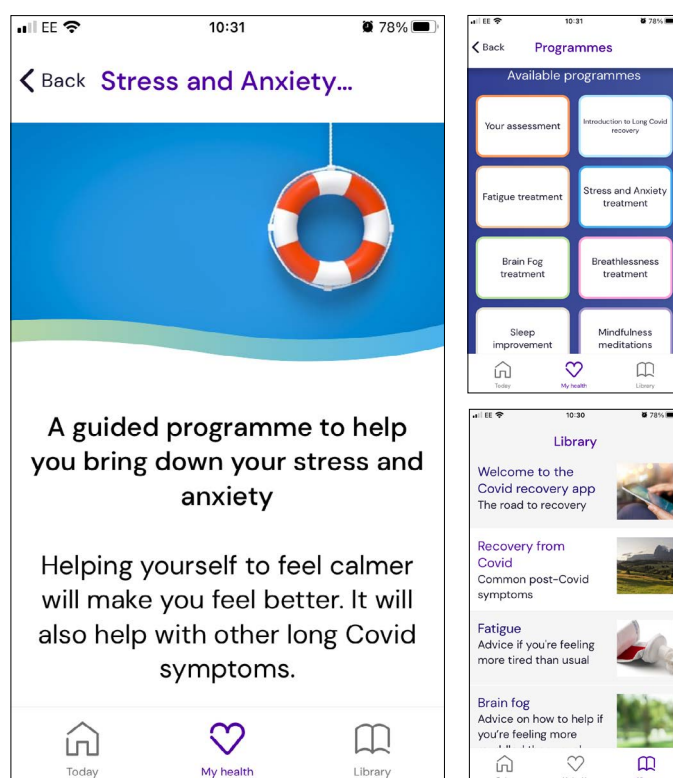
Focusing on ophthalmology, the team are working with clinicians at Moorfields Eye Hospital to investigate how to optimally introduce a teleophthalmology platform to facilitate referrals from primary to hospital care for retinal diseases. In particular, this aims to reduce the number of people being referred to hospital unnecessarily, and hence reduce waiting times for those who need hospital care. The platform changes people's roles, experiences and workflows, affecting optometrists, ophthalmologists and patients in different ways, and the team are addressing questions of how to make the platform usable, welcomed and trusted by these different groups. Longer term, the vision is that most decisions will be supported by an AI algorithm (for which a clinical trial is ongoing) so in parallel researchers are investigating how people respond to different forms of AI support. Sarah Abdi is working on the [HERMES project](https://fundingawards.nihr.ac.uk/award/NIHR127773) (<https://fundingawards.nihr.ac.uk/award/NIHR127773>) while Josie Carmichael is studying through the i4Health Centre for Doctoral Training.

Aligned with the WEISS Centre, the team have recently been awarded funding to develop tools to guide a surgeon during surgery to remove cancers on the pituitary gland ([\[epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/W00805X/1\]\(https://epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/W00805X/1\)\).](https://gov.</p></div><div data-bbox=)

Endonasal surgery is minimally invasive, which is better for the patient, it is challenging for the surgeon, both physically (manoeuvring the tools), and cognitively (maintaining contextual awareness). The main aim of the project will be on developing augmented reality information resources that optimally support the surgical team through different stages of the operation. Again, tools need to be usable, effective, safe and reliable. A new team member will shortly join Jeremy Opie and Soojeong Yoo, who are working on projects within WEISS on colonoscopy, cancer interventions, ultrasound scanning and liver surgery.

Other projects are focusing on long-term management of conditions where much more of the care is self-managed by the individual, with support from family, friends and health professionals. These include projects on type 2 diabetes, long Covid, prostate cancer, stress, fertility and multiple sclerosis. In all cases, there are questions around how to design to encourage self-care by providing timely information, supporting self-monitoring and facilitating supportive and efficient communication between individuals and professionals. The figures show example screens from the Covid recovery app developed with Living With which, at the time of writing, is being used by over 4000 patients registered with 33 different clinics across England.

Working in healthcare can feel laborious at times (with particular challenges of ethics, data protection, regulation, and working with busy professionals and patients), but it's also hugely rewarding, exciting and transformative.



TIDAL Network Plus: moving beyond the confines of current thinking

UCLIC Professor Cathy Holloway, Academic Director of the Global Disability Innovation Hub, was awarded £948,972 by EPSRC (EP/W000717/1) for the TIDAL Network Plus, together with collaborators from Strathclyde, Salford and Loughborough Universities. TIDAL stands for Transformative Innovation in the Delivery of Assisted Living Products and Services.

TIDAL N+ is setting out to improve the quality of assistive technologies (AT) and hence the lives



of the people who use them. The team's vision is for innovative, sustainable and equitable AT, both physical and digital. To achieve this, TIDAL N+ will build a transdisciplinary network – including designers, ergonomists, engineers, physical scientists and AI specialists, alongside entrepreneurs and manufacturers, AT users, clinical practitioners and commissioners. The aim is for this network to generate novel design, engineering and technological advances that will empower disabled people, older people and carers, through accessible and local solutions.

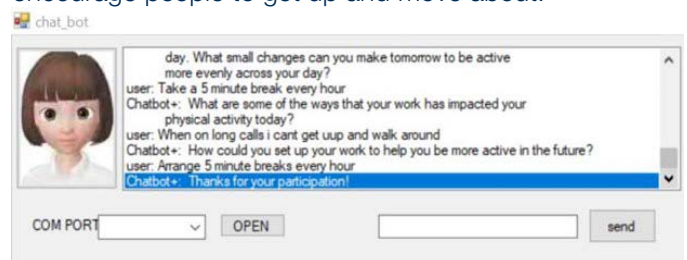
TIDAL N+ formally launched on 26 January 2022 with an online event attended by over 250 people. Speakers included the Chair of our Steering Group, Professor Wendy Tindale, Director of NIHR Devices for Dignity MedTech Cooperative; paralympian Susie Rodgers MBE, and Chapal Khasnabis, from the World Health Organization. They talked about the important role that TIDAL N+ will play in identifying AT users' unmet needs and co-creating solutions that will transform the AT landscape for users; the challenges of the regulatory landscape, especially in relation to data-driven and AI-based solutions; and the need to move beyond the confines of current thinking and engage in multidisciplinary collaborations, like TIDAL N+, to realise the potential of the global AT market and its social value.

You can find out more about our aims and our plans and also watch the video recording of our launch event on our website (ucl.ac.uk/tidal-assistive-tech).

Take a Break! Where HCI meets AI

The Humane AI network (<https://www.humane-ai.eu>) is funded by the EU Horizon programme (2020-2023), comprising over 50 partners from many different disciplines and industry. An overarching goal is to develop paradigms that enable humans and AI systems to interact and collaborate in a way that facilitates synergistic co-working, co-creation and enhancing each other's capabilities.

As part of this network, we have been involved in conducting a series of mini-projects. One of these was with partners Professors Michel Klein and Koen Hindriks, who are based in the social AI group at the Free University in Amsterdam. Our joint research was concerned with developing an interactive chatbot that was intended to help reduce sedentary behaviour. This was considered most pertinent during the pandemic, when most of us were working at home, sitting for hours on end in front of Zoom and Teams meetings. Two of our HCI MSc 2021 students (Amelia Ellis and Lingchen Pen) worked on the project, along with Sophie Egter van Wisskerkerke from Amsterdam, to determine which behaviour-change mechanisms to implement and how to design the micro-conversations with a chatbot to encourage people to get up and move about.



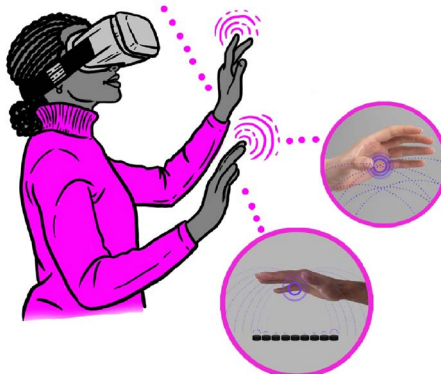
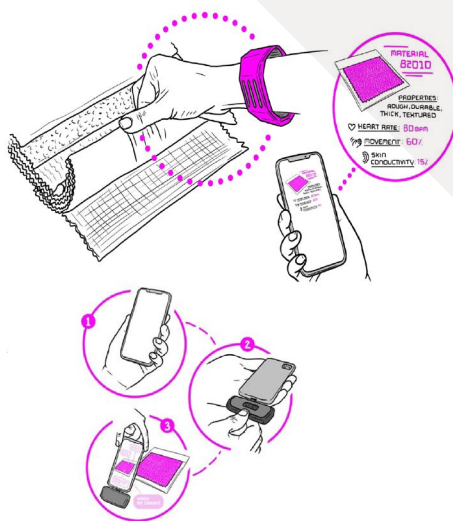
The aim was for the chatbot to appear occasionally and have a quick conversation with the user to raise their awareness and self-reflection on their wellbeing. We addressed several research questions, including how the chatbot should appear, whether it should be reactive or proactive and whether it should appear machine-like or human-like. An example of a mini-conversations is shown above; a cartoon-like avatar was used as the chatbot. An initial user study of the prototype showed how people found the chatbot to be helpful at encouraging them to take breaks but at times it seemed like they were nagging them too much!

The Textile Circularity Centre (UKRI)

Within the new **Textile Circularity Centre (TCC)** (UKRI, 2021-2025), UCLIC is driving the development of technology to support a textile circular economy by enhancing wellbeing and user experience. A circular economy is an alternative to the traditional make-use-dispose economy in which we extract maximum value from resources while in use, and recover and generate materials at the end of their life. Led by the Royal College of Art (Professor Baurley), TCC is a multidisciplinary centre aimed to turn post-consumer textiles, crop residues and household waste into renewable materials for use in textiles, developing new supply chains, textile production, design and consumer experience.

All innovation phases of the research will be underpinned by an in-depth understanding of wellbeing that is at the core of the TCC Consumer Experience (CX) research strand and that emerges from a multidisciplinary collaboration encompassing textile experience (Dr Petreca, RCA – co-leading CX), social science (Professor Jewitt, UCL – co-leading CX) and neuroscience (Professor Fotopoulou, UCL). As part of the CX research strand, UCLIC will target sustainable technology innovation through the following INNOVATE phases:

Phase 1 (led by Dr Youngjun Cho) will be focused on engaging consumers in understanding textile characteristics with emerging technologies for long-term maintenance in the circular economy. The aim is to develop new AI-powered approaches with RGB and thermal imaging to harness interactive low-cost ubiquitous



tools to capture garment material properties and behaviour. We will explore how such technologies will enable consumers to make informed choices during purchasing as well as helping them care about material quality maintenance.

Phase 2 (led by Professor Nadia Berthouze) will be focused on engaging consumers in embodied experiences of textiles to increase awareness of how they feel. As textile experiences are embodied, we will investigate how multimodal sensing technology can be leveraged to engage people in exploring how textiles feel to touch and how they behave and feel when worn. We will explore how such technology can break the fast-fashion waste and support fulfilling and satisfying experiences of clothing.

Phase 3 (led by Professor Marianna Obrist) will be focused on engaging consumers in digitally immersive experiences and services that amplify couplings between the resource flow, human wellbeing and satisfaction. Consumers will become key nodes in the circular value chain, enabling responsible and personalised engagement. We will harness the potential of multisensory technologies to link the physical and virtual world. We will explore and integrate visual, auditory, haptic and olfactory stimuli to create compelling multisensory textile experiences that convey core concepts of a circular economy and immerse consumers in this new culture.

Read more about the project: <https://www.rca.ac.uk/research-innovation/research-centres/materials-science-research-centre/textiles-circularity-centre>

Beyond Individual Persuasion

Funded by EPSRC, Beyond Individual Persuasion: Towards a Paradigm Shift in Interactive Visualisation and Sensing for Environmental Change is a 3-year project seeking to innovate the design of interactive visualisations and sensing for environmental change. It aims to do so by reorienting them beyond their current use as levers of individual persuasion, towards an extended role as technologies that can link behaviour change and sustainability policy. The link aims to be bidirectional: on the one hand, helping people in relating existing climate change and energy policies to everyday life; on the other, empowering them in influencing and engaging with policy-making by generating an enhanced understanding of their own everyday practices. We believe that there is vast untapped potential for digital technology to catalyse engagement with environmental sustainability policies. This project puts forward the ambition to realize such potential, and the vision of transforming the role of digital technology in relation to behaviour change for environmental sustainability. The project team spans across UCLIC (Enrico Costanza, PI; Georgia Panagiotidou, Research Fellow), UCL Anthropology (Hanna Knox, Co-I; Shyam Krishna, Research Fellow) and the UCL Energy Institute (Charlotte Johnson, Researcher Co-Investigator; Mike Fell, Senior Research Fellow).

In particular, the work will target practices and policies related to the built environment, in a variety of domestic and non-domestic buildings, and with policy contexts ranging from organisation-focused change (e.g. temperature policy in office buildings) to policies focused on increasing the use of renewable energy (e.g. by enabling collective self-consumption of rooftop solar or demand shifting within household or community settings). The involvement of four different user partners, who recognise the relevance of the proposed project, will facilitate research deployments across the

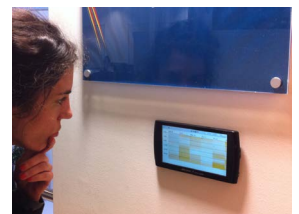
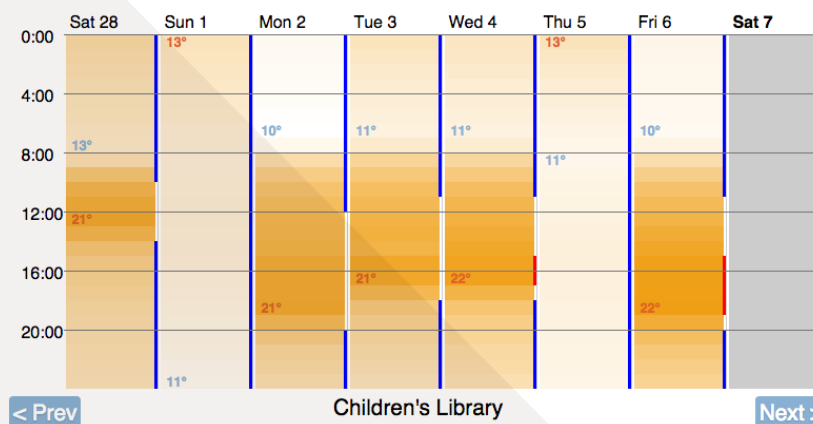
private (Fosters + Partners), non-profit (Carbon Coop; Repowering) and higher education (UCL) sectors. Strategic advice by project partner Arup will further broaden the scope and impact of our work.

The project will leverage network-connected sensor nodes and displays, generally considered part of the Internet of Things (IoT). The research will follow a user-centred approach, involving the iterative development of robust, fully functional 'high fidelity' IoT interactive prototypes and their evaluation in-the-wild through research methods from the social sciences, thanks to the close collaboration of our multi-disciplinary research team.

The project puts forward a novel participatory prototyping research approach: by combining ethnographic and user-centred design methodologies, we will involve (some of the) participants not only in the design, but also in the technical development of interactive visualisation and sensing prototypes. In parallel with more traditional researcher-led user-centred design and prototyping, hands-on workshops (such as 'hackathons') and online engagement activities will play a pivotal role in the research plan strengthening links between community interests and visualisation design. This approach is designed to actively increase the social and environmental sustainability of the research process: promoting the community ownership of the open-source prototypes developed throughout the project will prevent them from becoming unmaintainable e-waste once the research funding ends. The participatory prototyping activities will target multiple age groups, including teenagers, offering them learning opportunities in science, technology, engineering and mathematics (STEM) skills. Our collaboration with community-based partners will help us reach under-represented groups, particularly from BAME communities.

Left: a screenshot of the "temperature calendar", an interactive visualization showing how temperature varied over the past seven days using the metaphor of a weekly calendar (each hour is coloured to indicate the average temperature: orange indicates warmer, white colder). *Top right:* The display in context. *Bottom right:* initial concept sketches for the temperature calendar. The temperature calendar is an example

from our prior work (Costanza, E., Bedwell, B., Jewell, M. O., Colley, J. & Rodden, T. 'A Bit Like British Weather, I Suppose': Design and Evaluation of the Temperature Calendar. in Proc. ACM CHI 2016. <https://dl.acm.org/doi/10.1145/2858036.2858367>) on which the Beyond Individual Persuasion project builds.



UCLIC
NEWS
2022

GRANTS
UPDATES

EnTimeMent (ENtrainment & synchronization at multiple TIME scales in the MENTal foundations of expressive gesture)

EnTimeMent, a multidisciplinary project involving a number of institutions and industries across Europe, has just entered its fourth and final year. UCL & UCLIC have contributed to the project through innovative affective movement technology for chronic pain management. Below are some of our achievements to date.

■ **Applied Machine Learning:** We have proposed new movement and muscle activity sensor-based machine learning architectures to continuously track people's body movement across functional activity and detect events of protective behaviour, independently of the activity being performed.

■ **Body Movement Recognition Challenges & Workshops:** We have also initiated two challenges to foster research in the areas of automatic pain behaviour detection and affective body expression recognition. The first challenge and related workshop were held in conjunction with the FG 2020 conference and the second with the ACII 2021 conference. The second workshop included a panel discussion summarised here: <https://uclic.ucl.ac.uk/research/affective-computing/entimentment/where-are-movement-sensing-emotion-inferring-technologies-in-the-real-world>.

■ **Movement Sonification:** We have shown how machine learning and sonification algorithms could be integrated to develop new ways for increasing awareness of protective behaviour and trigger engagement in exploration of body movement capabilities.

■ **EmoPain@Home Dataset:** During the pandemic, people with chronic pain have engaged from their home in a mocap data collection of everyday home functional activity to support further innovation on pain behaviour detection. Using wearable full body motion capture sensors, they have worked on their own or with us remotely to collect data on those everyday functional activities (e.g. hoovering) that they perceive as challenging.

■ **Qualitative Studies:** Qualitative studies with physiotherapists and with people with chronic pain have enriched our understanding of pain-related behaviour, as well as movement strategies in pain and how these require decisions at different temporal scales.

The Global Disability Innovation Hub (GDI Hub) has also played a significant role in the project by facilitating the dissemination of the work of the EnTimeMent Consortium. One of these dissemination events, coordinated by our partner Qualisys, focused on markerless motion capture systems and was held in Genoa (Italy) in 2021 (<https://entimentment.dibris.unige.it/events/39-capturing-human-time-qualisys-workshop>).

The workshop explored the potential of this new technology in the context of pain-related protective behaviour tracking. We also organised a workshop at CHI 2021 on 'Rethinking the Senses' to explore within the Consortium and the wider communities multi-sensory and multimodal technology opportunities focused on disability interactions.

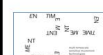
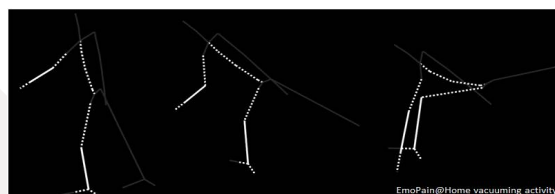
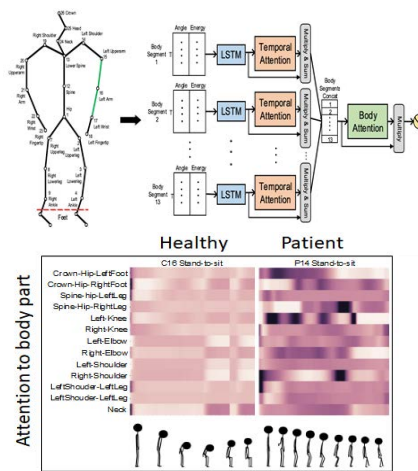
EU Horizon 2020 FET PROACTIVE project (2019-2022)

<https://entimentment.dibris.unige.it>

<https://uclic.ucl.ac.uk/research/affective-computing/entimentment>

UCL team: Prof. N. Berthouze, Dr N. Gold, Prof. A. C de C Williams, Dr T. Olugbade, C. Wang, R. Buono

GDI-Hub team: Prof. C. Holloway, Dr G. Barbareschi, M. Bandukda



AT2030: digital solutions to power assistive technology access

UCLIC has been supporting the **GDI Hub**-led grant **AT2030** (funded by UK AID) to develop new digital tools that will enhance data collection and evidence gathering, whilst also supporting the creation of an inclusive innovation ecosystem for assistive technology. Through this work we have developed a **data portal** of assistive technology need, are creating a digital tool for population health data collection and have supported over 20 innovators trying to enter the African market. We are also developing a number of new products such as **Tacilia** – a Voice Controlled Tactile User Interface based on a novel shape-changing material technology and an advanced speech recognition AI. In the next phase of work, we welcome three new post-docs who helped co-create the grant extension. Tigmanshu Bhatnager and Ben Oldfrey will join the innovation team to develop solutions which bring together sustainability (repair and local production) with assistive technology need in low- and middle-income countries, and Maryam Bandukda will join the team to develop new technologies for better representing the voice of disabled people living in low-resource settings. We will also be advancing our AI & AT work with collaborations with the **International Research Centre for AI** and will be advertising soon for a new team member.



A Taste of UCLIC

We kicked off our 21st Birthday celebrations on 23 February with a 'Taste of UCLIC', a lunchtime event where our students and staff shared food and drinks from their own countries, ranging from Portugal, China, Italy, Korea, Ireland, India and England. The gathering offered a much-needed opportunity for students and staff to meet in person, exchange ideas and see each other in the flesh after the long lockdown measures of the past couple of years.



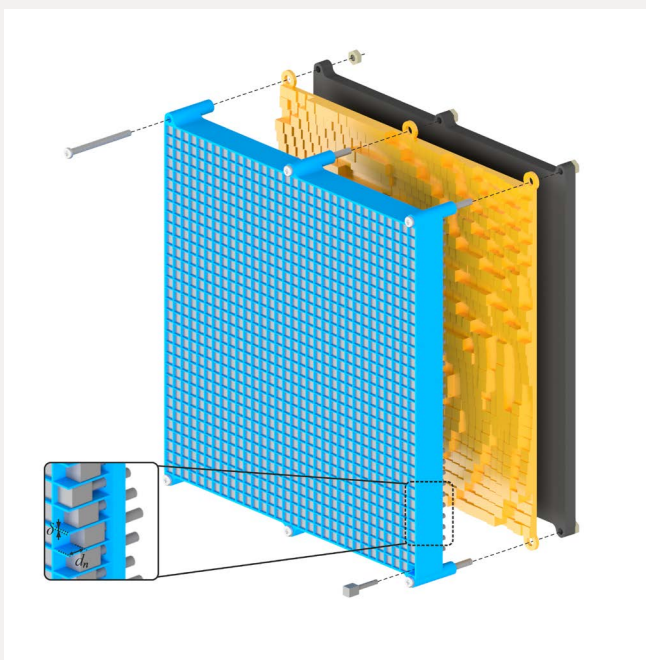
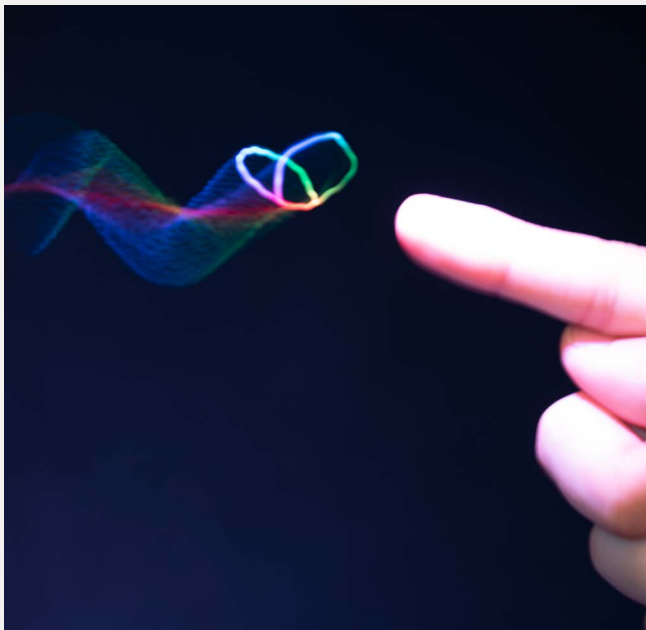
UCLIC
NEWS
2022



STUDYING
AND
TEACHING

New Sensory Systems MSc

The **Multi-Sensory Devices group** has developed a new Master's programme in Sensor Systems that will welcome its first cohort in September 2022 at the new UCL East campus. The programme will provide a hands-on understanding of how to design, deploy and use distributed sensors and actuators in the real-world, and will equip students with the knowledge, methods and tools to take on the whole development cycle of such sensory systems – from idea to deployment.



MSc in Disability, Design and Innovation

Launched in 2019, the **MSc Disability, Design & Innovation (DDI)** is looking forward to its fourth year.

Hosted by the **Global Disability Innovation Hub (GDI Hub)**, part of UCLIC and UCL Computer Science, and the world's first and only WHO Collaborating Centre for Assistive Technology), this pioneering programme brings together world leading expertise in disability, technology and innovation from its three founding partners: UCL, Loughborough University London and University of the Arts London, and sits at the leading edge of disability innovation, providing students with the skills and knowledge to become change-makers in the space of accessible and assistive technology and inclusive design.



In 2022, this year, our new lab will open at **UCL East**, on the Queen Elizabeth Olympic Park, providing cutting-edge prototyping equipment and facilities for DDI students.

Nominated for a Tech for Good award in its first year, the DDI MSc celebrates DDI students and alumni's awards. For example, Kate Mattick (19/20 cohort) won the **RSA Student Design Award** with 'Chat-e-Cycle', proposing the design of a tandem bicycle linked to a community scheme allowing residents to unite on a side-by-side experience for transport, exercise and social connection in rural areas. Akriti



Pradhan (19/20 cohort) published 'Inclusive Beauty: Making cosmetics more accessible for the blind and for visually impaired consumers' in *Cosmetics & Toiletries*, building upon a DDI dissertation project (supervised by Gabriela Daniels and Youngjun Cho). DDI alumni continue contributing to our world across a diverse range of sectors including health, accessibility, finance, IT and international development (e.g. JP Morgan, NHS, Huawei, and start-ups).

One of our students said,

“As a disabled person, DDI offered me the skills to solve problems in the world that I encountered. Solving them not just for me, but for everyone else in the future. My background was in Psychology, I had no programming experience, and I was unsure about how good a fit my skills would be for the programme, but DDI is so broad and varied that you can flourish with almost any skills that you bring to it. Whether your strengths are in thinking creatively, or doing research, or in business, this course has something for everyone. It is a complete kit for bringing your vision into reality, and the skills you learn will be useful for whatever you go on to do.”



For more details about the MSc In Disability, Design and Innovation, please contact: [Youngjung Cho \(youngjun.cho@ucl.ac.uk\)](mailto:youngjun.cho@ucl.ac.uk), Interim Programme Director, and [Aeesha Bhaiyat \(aeesha.bhaiyat@ucl.ac.uk\)](mailto:aeesha.bhaiyat@ucl.ac.uk), Programme Administrator.

Human-Computer Interaction MSc

The **Human-Computer Interaction MSc** is concerned with the design and use of computing technology, focusing on the interfaces between people and computers. This interdisciplinary degree programme sits at the intersection of engineering, behavioural sciences and design. Students acquire the research skills necessary to understand how people interact with computers and the design skills for constructing the digital products and services of the future. The programme combines academic rigour with practical and professional skills that are highly valued by employers.

During the summer of 2020 we had to radically rethink our approach to teaching delivery. Space was found in our homes so that they could be turned into recording studios. External cameras and microphones, a green screen and video-editing software all became essential tools, as we meticulously prepared for an entirely online delivery of the programme in 2020/21. As September 2020 approached, we welcomed a record-breaking number of new students to the programme from around the Globe. By the end of the first week of term, students had already completed a group mini-project on how digital technology has helped us through the COVID-19 pandemic. Watch the hilarious yet reflective, *One Virus Later*, by UCL HCI MSc students, Filipe Moura, Tehriem Asif, Eric Tan and Nina Li (<https://www.youtube.com/watch?v=INDjo1uiP5o>).

Fast-forward to today, and we're delighted to announce that no fewer than 20 students from the 2020/21 cohort were selected for the **Dean's List of top performing students for 2020/21**. Every year the Dean of Brain Sciences recognises the top performing students in terms of academic performance from across the Faculty. This year it was awarded to students that achieved a minimum final average of 74%, as well as achieving a minimum of 74% in their research project/dissertation. We are so incredibly proud of all our graduating students.



Graduation is a special occasion. We were delighted to be able to take part in the in-person graduation celebrations in March 2022 for students who graduated from UCL in 2020 and 2021. The event was a golden moment for former students to celebrate their achievements with their family and loved ones, and to reconnect with old friends. Of course, a graduation, wouldn't have been a graduation, without dressing-up in those long robes, and then flinging our hats high into the air as we celebrated together.

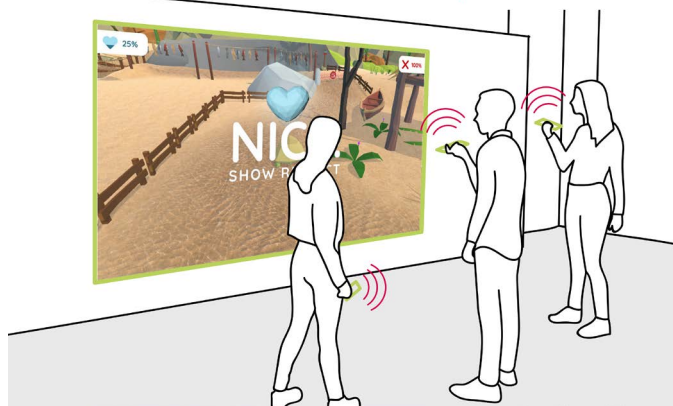
HCI MSc students are actively encouraged to present their work at prestigious international events. Emma Holliday was awarded an honourable mention at the **CHI PLAY 2021** Student Game Design Competition for work she conducted as part of the Serious and Persuasive Games module. You can read the published paper on **Breaking the Magic Circle** along with **a blogpost about the development of the game**.

Play the game:
<http://arcade.gamesalad.com/games/159627>

Read the whole paper:
<https://doi.org/10.1145/3450337.3483511>

Output **Public Display**

Input **3 x Smartphone**
(microphone & accelerometer)



As part of their Interaction Design coursework, UCLIC MSc students Roos van Greevenbroek, Emma Kalina, Tobias Klotz and Luke Snitter submitted an innovative, boundary-pushing game to the [CHI2020 Student Game Competition](#). Using a human-centred design process, they created 'Make some noise for Nature', a voice- and movement-controlled group game that teaches people about extinct animals, their role in extinction and promotes behavioural change. In this game, a group of three people collaborates to steer an endangered animal safely through its habitat (by making noises), while avoiding harmful objects and collecting items that positively contribute to this animal's life (by moving). During user testing, the game seemed to increase awareness and willingness in players to take action to protect endangered animals. The three UCLIC students were finalists in the CHI2020 Competition and were invited to present their project at the yearly conference in Hawaii. Unfortunately, the trip was cancelled, as COVID made its entrance.

Hear it from the students:

https://drive.google.com/file/d/1N0EZme2DXsRvw3VuidsvNpbLsN_gzHmy/view?usp=sharing

Play the game:

https://drive.google.com/file/d/1xRDSv1q4oUNrxYGwyGAYCDeYblcJPb_x/view?usp=sharing

Read the whole paper:

<https://dl.acm.org/doi/abs/10.1145/3334480.3381657>

Looking to the future, the programme continues to be

exceptionally popular, receiving hundreds of applications from highly-qualified candidates from around the world. We strongly encourage potential applicants to apply as early as possible to avoid disappointment.

Our innovative approach to blended learning is here to stay – we have developed skills in complementing the best of video lectures and online materials with in-person discussions and practical activities that take place in the classroom together. Activities are often structured around individual or group projects, such as the evaluation of a system or the creation of a prototype. The programme is assessed through varied coursework and an individual research project. To get an idea of the breadth and depth of research work undertaken by our students take a look at [Distinction MSc Projects](#) published on our website.

Our alumni have pursued careers with technology multinationals, start-ups, government agencies, consultancies and in academia. Many take up roles such as User Experience (UX) Researchers, Interaction Designers, Usability Specialists and Information Architects. We have a large network of alumni working in London and across the world. Many of them are involved with our industry speaker series and careers events, and they regularly send opportunities to our jobs mailing list for recent graduates.

For more details about the Human-Computer Interaction MSc, please contact: [Duncan Brumby \(d.brumby@ucl.ac.uk\)](mailto:d.brumby@ucl.ac.uk), Programme Director, and [Jo Pearson \(jo.pearson@ucl.ac.uk\)](mailto:jo.pearson@ucl.ac.uk), Senior Teaching & Learning Administrator.



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