Proceedings of the 15th Irish Human Computer Interaction Symposium

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Symposium chairs:
Dr Kyle A. Boyd & Prof. Raymond R. Bond
Affiliation: Ulster University

Editors of proceedings:
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These online proceedings include abstracts for poster and rapid-fire presentations in addition to the titles of full oral presentations.

The symposium was supported by the HSC R&D workshop grant scheme, Belfast School of Art and the School of Computing at Ulster University,

This symposium is a local activity of the **ACM SIGCHI Ireland Chapter:**
Officers (22-23):
Chair: Dr. Conor Linehan
Vice Chair: Dr. Kellie Morrissey
Treasurer: Dr. Benjamin Cowan

DOI:

Editorial

Editors: Kyle A. Boyd & Raymond R. Bond
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The Irish HCI Symposium is a showcase of work by researchers based in Ireland (North and South, including Northern Ireland), as well as Irish researchers based internationally, that have published in leading international HCI venues over the past year (2021-2022). Examples of venues include CHI, BHCI, CSCW, ECSCW, PDC, DIS, MobileHCI, NordiCHI, TOCHI, IwC and other highly ranked international HCI conferences and journals. The aim of the symposium is to give the authors of such work the opportunity to share their leading research with a local audience.

Before the main event an evening keynote talk was held and a visiting talk by Dr Simon Leigh from ORCHA / University of Warwick, 'Can we measure the 'quality' of health apps?'. Fifty people attended.

For the main symposium day we had 75 registrants and 15 from Ulster University, making 90 delegates. Attendees were researchers and academics from a range of universities including Trinity College Dublin, University College Cork, Dublin City University, Munster Technological University, Dundalk Institute of Technology, University of Galway, Swansea University and Ulster University. We also had a range of professional designers and software developers from commercial companies, including Instil, Chroma Lighting and Cumulus Neuroscience. Six staff from HSC in Northern Ireland also attended having professional backgrounds in medical and digital health innovation.

Three keynotes were delivered during the main event:

1. Prof. Harold Thimblebey: How HCI can see and solve problems of healthcare,
2. Prof. Lui Ciolfi: Digitally Entangled Worklives Beyond the Pandemic
3. Dr Benjamin Cowan: Hey Google- why am I speaking like this? The need for theory in understanding our interactions with speech interfaces.

The keynotes were interspersed with themed sessions on Digital Health, Digital Mental Health and Interactive Technologies. A rapid-fire and poster session was held for late breaking work within the HCI discipline. We had an encouraging uptake from PhD students. A poster session was also held during the day.

This was the first time that the Irish HCI symposium was held in Northern Ireland, which will aid the growing presence and impact of HCI research in the province. Given the interdisciplinary nature of HCI, it was organised by two schools at Ulster University, namely, the Belfast School of Art and the School of Computing, which widens the interdisciplinary networks within Ulster University.

Poster & rapid fire abstracts

ID: 2

Supporting the Design of Mobile Health Technologies for a Better User Engagement

Authors: Tochukwu Ikwunne [1], Lucy Hederman [2], P. J. Wall [3]

Affiliations: ADAPT Centre, Trinity College Dublin, Ireland

Keywords: User engagement, socio-cultural filtration, socio-cultural contexts, mobile health

Abstract: Despite the significance of user engagement for the efficacy of mHealth systems, many such interventions frequently do not include user-engaging attributes. This is because users' needs and the socio-cultural contexts of the user group are frequently not considered in detail during the mHealth design, development, implementation, and operation stages. As users' activities are influenced by their socio-cultural contexts, it is important to capture such socio-cultural contexts during the various stages of mHealth. This research suggests that consideration of such contexts of the user group is needed because techno-centric approaches to mHealth design and user engagement and other approaches that rely on existing universal frameworks for user-centered design have been proven to be ineffective.
Lack of engagement with mHealth systems is due to socio-cultural and organizational issues. For example, when mHealth applications developed in the Global North are implemented in the Global South, there may be many and varied social, and cultural differences and beliefs. In cases such as this, it is essential that implementation be localized to enhance the success of the mHealth systems. The assumption that technology designed in the Global North can be simply dropped into the Global South and expected to work is a "fallacy."
This research suggests that consideration of such socio-cultural contexts of the user group should be considered.

This research thus seeks to examine how mHealth design processes can be developed in order to improve user engagement in mHealth. In an attempt to take socio-cultural factors into account, this research proposes to develop a new socio-cultural framework called the Design Process Engagement Enhancement System (DECENT), which considers socio-cultural contexts in the design process of mHealth systems. Thus, the DECENT framework considers and incorporates the user's needs as well as the socio-cultural contexts of the user group in order to aid designers/developers in creating mobile health designs. The focus of this research is the development and testing of DECENT in the Global South.
This research follows a Design Science (DS) methodology approach to answer the research question: how can a design framework be developed in order to improve user engagement in mHealth technologies?

The DS approach is used to develop DECENT as an artifact, to ensure that it addresses the needs of developers aiming for more user-engaging mHealth. Furthermore, DECENT will encompass design thinking techniques for use by developers of mHealth technology to understand the needs of the mHealth users, the potential of the mHealth technology, and the necessities for mHealth success.

ID: 4

An Evolutionary Mismatch: Designing resistance against the exploitation of our primitive minds by technology.

Authors: Mateus Bettio Moreira, Andrew Errity

Affiliations: Institute of Art, Design and Technology

Keywords: resistance to persuasion, manipulation, design ethics, evolutionary psychology, UX

Abstract: Persuasion profiling, deceptive charts, false experts, addictive mechanics, fear-inducing and emotional narratives, the average internet user is constantly bombarded with content sometimes created to persuade, manipulate or exploit our minds that are still in the process of adapting to our ever-advancing technological environment. This work looks into how humans are currently interacting with persuasive or manipulative technology, what are their opinions about it, and proposes a design solution that was tested in a between-group study. The literature review identified different ways internet users can be exposed to unethical features, including malicious uses of the Hook Model (Eyal, 2008) and BJ Fogg's Behaviour Model (2010). A survey with 70 participants revealed that people are both uncomfortable with persuasive technology and that ~40% of participants believed it had low or no impact on their behaviour. Data from the survey aggregated with other sources informed the creation of personas, storyboards, and empathy maps. A deep analysis of popular user interfaces including Facebook's, TikTok's, and Google's was conducted to pinpoint persuasive elements, techniques, and manipulative features designed to change user behaviour in favour of the actor. The ideation process incorporated APA's guidelines were applied to inform decisions taken during the design process towards ethical practices. Principles of evolutionary psychology, user experience design, and gamification were used as foundations for the creation of the final artifact. The design process resulted in two prototypes (control and intervention) that were tested with a between-group experiment, where control represented a standard social media interface, and intervention was a gamified experience designed to protect users against manipulation and bias using custom widgets integrated with the main app interface. The experiment measured Cognitive Load (NASA-TLX/RAW-TLX), Satisfaction (NPS), Usability (SUS) and a Forewarning Effectiveness Questionaire. Results show a statistically significant difference in the cognitive load where intervention was higher, but no statistically significant differences could be identified in terms of Satisfaction, Usability, and Forewarning Effectiveness. Finally, interviews and a thematic analysis were conducted where users reported the most liked and disliked aspects of the artifact.

ID: 6

Exploring User's Mental Models of an AI-Driven Recruitment System Using Design Thinking Methods as an Approach to Ideating XAI

Authors: Helen Sheridan [1], Dympna O'Sullivan [2], Emma Murphy [3].

Affiliations: TU Dublin

Keywords: AI, XAI, Design Thinking, HCI

Abstract: Artificial Intelligence (AI) is playing an important role in society including how vital, often life changing decisions are made. For this reason, interest in Explainable Artificial Intelligence (XAI) has grown in recent years as a means of revealing the processes and operations contained within what is often described as a black box, an often-opaque system whose decisions are difficult to understand by the end user. Our work presents the results of a design thinking workshop with 20 participants (computer science and graphic design students) where we sought to investigate users' mental models when interacting with AI systems.

We present our investigation into users' mental models for AI and ideate XAI solutions using cross collaborative, interdisciplinary participants using a design thinking methodology. Workshops were conducted using an AI design problem statement within a relevant discipline - recruitment, that could be well understood by lay users. Design Thinking activities were carried out with interdisciplinary participants from both graphic design and computer science backgrounds which were used to explore how users understood the proposed AI system and to uncover blind spots in their understanding and associated challenges. We hoped to explore what users' "internal representations" [T. Kulesza, S. Stumpf, M. Burnett, and I. Kwan, 2012] of AI systems that might be based on their real-world experiences and build on this to develop ideas as to how these AI systems might be more usefully explained.

Using two personas participants were asked to empathise with two end users of an AI driven recruitment system, identify pain points in a user's experience and ideate on possible solutions to these pain points. These tasks were used to explore the user's understanding of AI systems, the intelligibility of AI systems and how the inner workings of these systems might be explained to end users. We discovered that visual feedback, analytics, and comparisons, feature highlighting in conjunction with factual, counterfactual and principal reasoning explanations could be used to improve user's mental models of AI systems.

ID: 7

A User Experience Methodological Framework and Dashboard for the Measurement and Scoring of Dynamic, Adaptive and Intelligent Aspects of a Software Solution

Authors: Vivien Leigh Johnston [1], Jonathan Wallace [2], Michaela Black [1] Raymond Bond [2] and Maurice Mulvenna [2]

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Keywords: UX, HCI, evaluation, dashboard, visualisation, framework, development roadmap, usability test, eye tracking

Abstract: The software development lifecycle of a service solution can have an impact on its user experience (UX) and ultimately the overall success of a business. Previous UX frameworks focus on providing software development and design teams with a blueprint to adhere to during the development process, particularly at the end as a summative evaluation. These frameworks focus on the attitudes and behaviours of their end-users, UX needs, usability and innovation. However, research has shown that there are gaps within each framework, and no definitive visualisation tool to assist both teams with a roadmap for developing the UX of a system. By taking it on a full journey, from iterative design and development to deployment with end user feedback, the Dynamic, Adaptive and Intelligent Visualisation Tool aims to fulfil this gap. It incorporates a flexible framework that focuses on three core aspects: Dynamic, Adaptive and Intelligent, that have been identified during early research and their associated parameters. Dynamic refers to the contextual information of an end-user, their device and physical environment. Adaptive relates to the knowledge set of each end-user, their capabilities and goal for using a service solution. Intelligent is the use of data analysis to identify patterns and trends within datasets, to ultimately assist with the prescription of a user interface that is appropriate to each end-user.

The Dynamic, Adaptive and Intelligent Visualisation Tool is an interactive web application. It can work with any software development methodology during all stages of its process. In addition, a variety of design materials can be used to assist with the evaluation of a service solution and its UX. These range from data driven, such as datasets, observational approaches consisting of screenshots and access to a testing platform to name a few. Each design material is used to measure and score parameters that have been identified within a service solution. These are then automatically calculated by using a hierarchy flow weight measurement, to obtain an overall score and status for a service solution, whether it is bronze, silver or gold. The tool also provides recommendations that assist software development and design teams with the enhancement of their service solutions UX over time. It gives both teams the option to justify whether a recommendation is for now, or something to consider later in the development process, which previous frameworks and tools lack. This allows for tracking a service solution progress throughout all stages of

development, whilst also providing an opportunity to close the loop of the flexible framework by validating scores with stakeholders. This feature can assist with future decision making by obtaining valuable information, and ultimately contribute towards the success of a business. The Dynamic, Adaptive and Intelligent Visualisation Tool engages with a variety of cohorts, whilst also supporting the needs and values of end-users and overall business outcomes. It has been reviewed by third-party companies, with initial positive feedback received, and valuable insights have been obtained via usability tests with eye tracking. These were conducted within a UX lab with five participants.

ID: 8

Ways to Quantify the User Experience of Healthcare Apps

Authors: Maciej Hyzy [1], Raymond Bond [1], Maurice Mulvenna [1], Lu Bai [1]

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Keywords: UX, usability, digital health apps

Abstract: There are behavioural and attitudinal user experience (UX) metrics. Both are of interest in quantitative research as they reveal how users use and feel about a product. Behavioural metrics can be quantified with user clicks, page views, time spent on page etc. Analytics of behavioural metrics can give an indication as to what information/features end-users are interested in.

Attitudinal metrics are often questionnaire tools, and they are a prevalent method used to assess UX, or its aspects, of healthcare apps. Usability as an aspect of UX, has frequently been quantified with tools such as System Usability Scale (SUS) and Software Usability Measurement Inventory (SUMI). Moreover, these tools are used to broadly assesses usability of different products and have not been designed for healthcare apps. In 2019 a new tool specifically designed to assesses usability of mobile health (mHealth) apps called mHealth Application Usability Questionnaire (MAUQ) has been published. Hence, this new tool may be more fit to assess usability of healthcare apps. To assess whole of UX, tools such as Mobile Application User Experience Checklist (MAUX-C) could be used. However, there is no consensus on the limitations of questionnaires when assessing UX of healthcare apps.

Questionnaire tools are designed to be used by either end-users or assessors. End-users give their feedback based on their use of the product, using questionnaires such as SUS. When there is no readily available users or time, assessor can use questionnaires, such as MAUX-C, to assess the healthcare app. Assessor with an understanding of UX using validated questionnaire (such as MAUX-C) can approximate how UX friendly healthcare app is.
UX of digital health apps can also be assessed by health compliance specialists. The Organisation for the Review of Care and Health Applications (ORCHA) is a United Kingdom based digital health compliance company that specialises in the assessment of digital health apps. The assessment questionnaire (ORCHA baseline review) includes a ‘usability and accessibility’ section. This may be a more rigours way of assessing digital health apps than self-assessment with questionnaires, due to trained assessors being involved.

Currently there appears to be no all-encompassing ‘gold standard’ to quantify UX for healthcare apps, neither with behavioural nor attitudinal UX metrics. There only appear to be different methods that highlight different UX problems. And different questionnaires, that can be used based on availability of end-users and time. In this talk we will explore these different methods for measuring UX and explore their advantages and disadvantages and present a framework based on this analysis.

ID: 9

A study protocol to measure the variability of user testing methods in the medical device industry

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Affiliations:Ulster University, School of Art and Design, Northern Ireland, UK

Keywords: UX, Usability, HFE, Medical Device Design

Abstract: Introduction
The success of a medical device is largely based on its ability to be employed as per its use specification to safely achieve the intended outcome. Central to this is the design of the device which, if poorly executed, contributes to 'use error' which affects the efficacy, safety, and user experience of a medical device. Human factors guidance provides recommendations to evaluate experience in a bid to improve design efforts and ultimately the safety and usability of medical devices. The heterogeneity of the industry means that the interpretation of these guidelines is subjective and adapted differently to suit the use specification of the devices. There is a lack of substantial evidence in literature to indicate which user experience testing methods are favoured and widely used in practice.

Aim
The aim of this study is to explore the perceptions of industry professionals on factors influencing the evaluation of user experience in the design of medical devices. The primary objective is to explore the relationship between use specification and human factors regulations in the selection of user testing methods. The secondary objective is to investigate the role of the user in the design process and the consequent influence on user experience evaluation.

Method
A bespoke survey approach was taken to achieve the objective of this structure by crafting the questions and data collection strategy to interrogate the key issues. The survey is to be distributed online on different platforms targeted at medical device industry professionals. Snowball sampling is intended as a participant recruiting strategy to reach a broad audience. The data is to be analysed using descriptive analysis, using inferential statistics and thematic analysis of the open-ended questions.

Anticipated Results
The data collected from the survey is to be analysed and is expected to highlight the various user experience testing methods that are used and the gaps at different medical device design phases within industry, throughout the product development lifecycle. The association between use specification and the evaluation methods applied will be identified and the medical device professional's priority hierarchies for user experience and usability of medical devices should be identifiable.

Conclusions

This study is designed to shed light on industry best practices, the gaps, and the variability of user experience testing methods for various medical devices, as well as the preferred methods, and the aspects of user experience considered in medical device design. The results from this study will contribute to medical device user experience knowledge base providing a best practice guide for when and how to conduct effective usability testing. This will in turn improve the experience quality and overall fit for purpose of each product.

ID: 10

Identifying Design Opportunities for Digital Cues in Gait Rehabilitation

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Keywords: cues, rehabilitation, assistive technologies, accessibility, gait, mobility aid

Abstract: In recent years, interactive systems have been developed to help patients going through gait rehabilitation. These systems can bring awareness to inexperienced users about the correct usage of mobility aids during earlier stage of rehabilitation.

Cueing is defined as the use of external temporal or spatial stimuli to facilitate the initiation and continuation of movement. For gait rehabilitation, cues can take the form of multimodal stimuli, providing metrics and instructions for patients to correct their movements, and can be used in multiple contexts and objectives. Therefore, the design space of interactive systems for rehabilitation is quite broad and there is a lack of systematic guidance for designers who are interested in creating and evaluating novel assistive tools.

We performed a systematic literature review on the usage of cues in gait rehabilitation and selected 28 studies. Preliminary results shows that most studies included adults aged 60 or older, with different walking and cognitive skills. On most studies participants performed mobility tasks walking on the ground floor, at a self-selected comfortable speed for short distances (less than 10 meters), in controlled environments (e.g. gait lab). Overall, results highlight that external cue (visual and auditory cues) can improve gait by directing attention to the tasks of walking and controlling movement.

Further studies should be developed to compare different modalities, such as vibro-tactile and 3D-sounds, in particular taking into account context of use and special needs of participants. We recommend the design of systems allowing digital cues for improved first-person experience, with animated cues for better learnability. Gamification strategies could be used to improve intrinsic motivation as well as to adapt the system to the patient's rehabilitation stage. For this, the use of technologies enabling motion sensing and tracking user's engagement would allow personalisation of the system, which can be particularly beneficial to improve adherence to the program.

Source of the abstract:
Peres B., Motti Ader L. G., Campos P. F., Many Cues, Few Clues: Identifying Design Opportunities for Digital Cues in Physical Rehabilitation Processes.

Presented on 21/06/2022, at the Workshop DISAB 2022 - Engineering Interactive Computing Systems for People with Disabilities, 14th ACM SIGCHI Symposium on Engineering of Interactive Computing Systems EICS
Peer-reviewed, to appear (CEUR Workshop proceedings)
https://www.uphf.fr/evenements/disab2022/program

ID: 11

mHealth use in healthcare facilities: a review under the People-Policy-Technology (PPT) framework

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Keywords: Mobile devices, healthcare, mHealth, Medical Device, cyber security, privacy, data protection

Abstract: Mobile Health (mHealth) is medical and public health practice supported by mobile devices, such as mobile phones, and other wireless devices. While there are increasing opportunities for the adoption of mHealth, solutions for enhancing services and patient care are not restricted to Medical Device (MD) regulated software. In particular, during the COVID-19 pandemic, many patients and healthcare professionals embraced the possibility of using available mobile devices and applications, exploring the opportunities to reduce the burden on strained services.

We searched academic and grey literature published from 2010 to 2021, and used the People-Policy-Technology (PPT) framework (Schlarman , 2001) to analyse and discuss some of the challenges related to the use of personal devices and mobile applications for health and medical purposes. We extended the PPT model to include all user groups having access and therefore responsibilities for the use of personal data for medical purposes, i.e. medical staff, patients, as well as visitors and contractors.

Despite strict surveillance under the European GDPR or institutional policies, user behaviour issues present risks for data protection, privacy, and safety. This includes the use of personal devices, disclosure of personal or medical data inadvertently, lack of awareness, and accessibility on policies and regulations. Many difficulties in misuse of medical software are not caused by the software itself, but rather, by the inappropriate use of the software or use of non-MD apps for medical purposes. Some apps, although they are non-MD, can collect sensitive data from users without being transparent on how this data is managed , e.g. wellness, fitness, period tracker.

There can be difficulties in converting general, often national policies, to local policies and procedures. Training needs to be implemented to ensure that all user groups are aware of their personal responsibilities, ensuring that regulations are applied, apps are compliant and that their use is fair and appropriate.

From the technology perspective, MD software is subject to regulations according to the defined clinical category and risk assessment. Therefore, it is responsibility of

designers, developers and software engineers ensure that MD software and general apps supporting mHealth are fit-for-purpose. This also means providing users with information transparency on data collection, control for data capture, storage, and processing such as anonymisation, pseudonymisation and time limits.
Our position is that policies and technologies should be more considerate of users' behaviour, which includes use of non-medical software for medical purposes, and situations where users seem to choose usability over safety.

Source of the abstract:
Motti Ader, L. G., MacEntee B., Rutkauskaite K., Chichilidze N., Kearney D., Lynch S. A., Crowley K., Richardson I., mHealth use in healthcare facilities: raising awareness in data protection, privacy and safety. 15th International Conference on Health Informatics, HealthINF 2022, 9th-11th February, 2022. Peer-reviewed. Presented via on-line streaming by Brona McEntee at 15th International Conference on Health Informatics, HealthINF 2022, 9th-11th February, 2022.

ID: 12

User testing of a prototype six degrees of freedom (6DoF) Virtual Reality (VR) experience by expert user groups.

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Keywords: UX, VR, Simulation, HCI, Usability, Story Living, Storytelling, Six Degrees of Freedom (6DoF), Immersive, Spatial environment design

Abstract: Background (rational):
A current lack of understanding of how to design and optimise the spatial design for a six degrees of freedom (6DoF) 'Story living' VR experience, which uses the environment as a storyteller, could result in poor UX.

This project evaluated the success of a prototype VR experience developed in collaboration with the Ulster Museum in Belfast (NMNI) and Ulster University. By designing an immersive VR experience for NMNI's most popular key exhibit, the Twenty-fifth dynasty Egyptian mummy Takabuti. It will virtually make Takabuti and the world she knew digitally live again in a (6DoF) VR experience.

Project Aims:
(I) to explore the power of rich (6DoF) storytelling – 'story living' as a critical spatial design tool to improve immersive User Experience (UX)
(ii) to investigate the UX of immersive reality platforms and design and evaluate a narrative-driven case study (Takabuti) where the technology has been adopted,

Methods:
Two sets of expert users, Group A – Museum NMNI experts (N=5) and Group B – Ulster University VR experts (N=5), were user tested on the Takabuti VR experience prototype. Their feedback was analysed using bespoke questionnaires and open questions about their use of VR before the experience. Furthermore, using a bespoke VR SuS questionnaire and open questions on their experience using the prototype after completing the actual VR experience.

The user testing used PC-based VR, fully seated, using Meta Quest 2 head-mounted display (HMD) and two handheld controllers.

After three weeks, they again were asked to complete an online version of the SuS they had completed after the original VR experience. To note any change over time in their recall of that immersive experience.

Results:

This extensive feedback was then analysed to evaluate the prototype's success. On the whole, a large percentage of the participants enjoyed the experience. Using the environment as a storyteller was successful in the critical areas of scale and atmosphere of buildings, lighting and weather.

Movement within 6DoF is still problematic. Two options (Teleportation and driving using a controller mini joystick) were explored to move around the 6DoF prototype. One (Teleportation) was overwhelmingly chosen in preference to the other which did cause some mild motion sickness. In addition, the use of environmental affordances, spatial audio and delayed memory of the experience was discussed and explored.

Conclusion:
It is essential to conduct user testing to fully understand narrative-driven 6DoF case studies such as the “Takabuti” VR experience. Both in its use as a ‘Story living’ spatial design tool and how it affected participant User Experience (UX).

Using bespoke SuS questionnaires to gather valuable expert user data both on the day of the experience and three weeks beyond it can be very helpful in informing necessary design iterations for updates to improve UX in future iterations of such complex immersive projects.

ID: 13

Assessing the transparency of a visualisation platform displaying the activity of individuals with dementia who are experiencing circadian lighting

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Keywords: Usability, visualisation, healthcare, dementia, circadian rhythm, activity

Abstract: The integration of sensing and actuating technologies to deliver responsive frameworks for solving user needs has been a huge support to multiple industries. Of particular importance is the heavily burdened and highly understaffed healthcare industry. However, the ability to provide such solutions is dependent on the accurate understanding, manipulation and visualisation of the domain-specific data. A significant part of this involves studying the human-computer interaction of these technologies and their applications in order to increase their value. Therefore, this work divulges on the relationship between lighting and related human activity metrics, with an emphasis on assessing the clarity of the information provided on the visualisation platform. The context of this work is outlined in the following.

For hundreds of thousands of years, the natural ‘alarm clock’ of the human body has been determined by the seasonal timing of the rising and setting sun. These light-dark intervals inform the body of their sleep/wake schedule, activity levels, energetic state and mood, by controlling the release of the melatonin hormone. Therefore, the variability in these body processes for any individual are the result of their synchronisation with these light-dark cycles, through a system known as the human circadian rhythm.

Measuring an individual’s circadian rhythm therefore requires aggregating data surrounding the general activity of an individual, in varying degrees of granularity aligning with the 24 hour light-dark cycle. In this work, a daylight-simulating luminaire has been developed, which encourages alignment of the human circadian rhythm to the approximate 24 hour cycle. This is paired with a sensing device which can unobtrusively track an individual’s position at a high resolution. In this way, the research objective to determine the impact of the lighting on circadian rhythms can be achieved.

A simultaneous objective is to assess how useful the collection and presentation of this data is for those using making use of the system. In this work, the focus is on observing individuals with dementia, since their diagnosis and typical age demographic lends itself to a stronger de-synchronisation of the circadian rhythm. Therefore, informal workshops were held with care staff in a local care home in Belfast to assess the human-computer interaction with the visualisation dashboard presenting these activity metrics. We have designed several simulations of resident-typical activity which the sensor is capable of tracking. The metrics are stored within

a database and presented on a plug-in dashboard. An assessment of the transparency of these metrics is achieved by utilising feedback from care staff. The results will then be used to inform future versioning of the visualisation platform. The end goal is to optimally address the care staff need in alignment with the scope of the technology used in the framework.

ID: 14

Designing accessible immersive interfaces for sensory preparedness in daily-living: Engaging autistic users.

Authors: Alice Tennant

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Keywords: autism, human-centred design, participatory, sensory, UX, UI, accessibility, data visualisation, VR, AR, inclusion

Abstract: Overwhelming sensory experiences are a significant barrier to the autistic population in daily-living activities that can impact an individuals' ability to access education, healthcare, travel, employment, and independent living. Neurological differences of autistic people lead to distinct sensory experiences, compared to those without autism. There is little knowledge of how these sensory environments can be managed by the individual to enable access to the same products and services that the non-autistic population use with ease.

The autistic community show skill, talent, and a great desire to be more active members of the population, however employment rates among the autistic population are just 16%. This is a very low figure compared to employment rates of the disabled (52.4%) and general (75.7%) populations. Prioritising access to public services, ways to improve life skills such as the ability to 'prepare for things that scare me in the real world' or 'go to places that I am unsure of in real life', are things the autistic population want help to achieve, with sensory environments cited as one of their main obstacles. We should aim to understand, accept, facilitate, and integrate autistic people into our society by making it more accessible.

This research aims to answer the following:
1. Does the autistic community require and desire improved preparedness for the sensory landscape of daily-living activities?
2. What objects, agents and activities do autistic individuals identify as sensory barriers, and what are their access priorities?
3. How can the sensory environment be recorded and subsequently re-presented in a format best suited to the autistic user?
4. Can utilising human-centred design philosophies, and participatory research methodologies, address the area of accessible interaction design for autism?
5. Does use of an interactive/immersive sensory tool developed in this research, help autistic people access daily-living activities?

At the time of writing, no interactive tools for an autistic individual to preview and understand the sensory environment have been found. Existing sensory studies aim to assist with language, travel planning, contextual explanation, sensory regulation, and the education of the non-autistic population on autistic sensory experiences. None, however, provide a tool for the autistic user to plan and/or practice their activity within varying sensory environments. While accessible design is well established there is very little research into cognitive accessibility of places, or interactive interfaces and experiences.

This research hypothesises that, through human-centred design, a mixed-methods approach and participation from the autistic community, a tool to support access to daily-living activities can be realised. This work will aim to establish a temporal database of information about; sensory stimuli within an environment over time, feedback on sensory barriers identified by autistic people, a framework for surveying the sensory environment, and a contribution to cognitively accessible interaction design. Solutions that could be explored include AR, VR and mulsemedia (multisensory media). Knowledge produced contributes towards answering the challenges that face HCI today, namely, ‘well-being, health’, ‘accessibility and universal access’ and, ‘human-technology symbiosis’.

ID: 15

Developing a toolkit for the analysis of real world anonymous digital mental health intervention events

Authors: Gillian Cameron [1] [2], Maurice Mulvenna [2], Raymond Bond [2], Edel Ennis [3], Siobhan O'Neill [3]. David Cameron [1], Gavin Megaw [1]

Affiliations:[1] Inspire, Northern Ireland, UK, [2] Ulster University, School of Computing, Northern Ireland, UK, [3] Ulster University, School of Psychology, Northern Ireland, UK

Keywords: data analysis, mental health, digital mental health interventions, real world user interaction, usage analysis, machine learning

Abstract: User event logging records in-the-moment information on interactions between the user and platform. These interactions are recorded anonymously, producing a substantial user event log dataset. Analysis of user event logs can be used to identify usage patterns, highlight user behaviour and forecast future usage patterns by using data analytics and machine learning methods.

This work presents a working toolkit for analysing real world user interaction logs, based on a case study of a digital mental health intervention, including analysis techniques such as Frequency usage analysis, survival analysis/user retention, user engagement analysis, visual hierarchy analysis and user archetype discovery.

Digital mental health interventions delivered in the workplace have proven to be a resource efficient and effective way to raise and broaden awareness to large numbers of employees, however engagement with these interventions, and their retention rates remain to be an ongoing challenge. The Inspire Support Hub is a wellbeing platform containing a range of self-help tools and resources, and is offered to employees as part of an Employee Assistance Programme.

An embedded chatbot is the focal point of the hub, offering self-assessment questionnaires, helping to guide the user around the self-help tools and resources by providing tailored self-help recommendations. Event logging has been built into the Inspire Support Hub platform, anonymously recording button clicks, link clicks and self-assessment scores on anxiety, alcohol, depression, self-esteem, sleep and stress along with their unique user ID and timestamp. The user's recorded moods and hours of sleep are also logged. Analysis has been completed on 104,831 interactions by 9042 unique users.

Results from this battery of analysis techniques are being utilised to understand how the Inspire Support Hub is used in a real world environment, to offer actionable insights to adapt the hub to improve the user experience and increase engagement. These insights will provide a roadmap of recommendations for future development.

ID: 16

Requirements and design of a technology toolkit to support people living with dementia and their carers to engage in shared care planning

Authors: Michael Wilson [1], Julie Doyle [1], Ann Marron [1], Dympna O'Sullivan [2], Jonathan Turner [2], Ciaran Nugent [2]

Affiliations:[1] NetwellCASALA, Dundalk Institute of Technology, Dundalk, Ireland, [2] ASCNet Research Group, Department of Computer Science, Technological University Dublin, Dublin, Ireland

Keywords: Co-design, Dementia, Self-care, Activities of Daily Living, Meaningful Activities, Goal-setting

Abstract: Persons living with dementia (PLwDs) should be at the centre of decision-making regarding their plans and goals for daily living, including basic activities (e.g. feeding, dressing, hygiene, and mobility), more advanced activities (e.g. personal finances, using transportation, cooking, performing household chores, and shopping), and other meaningful activities that help promote health and mental well-being (e.g. social occupations, intellectual pursuits, recreational pastimes). However, there is limited involvement of PLwDs and their informal carers (e.g. relatives or friends) in the design or use of technology that could be used to support their personal plans for independent living at home and to support engagement in daily and meaningful activities while also encouraging and facilitating shared decision making and care-planning.

The Smart Dementia Care project aims to develop a digital toolkit to support someone living with mild-to-moderate dementia, together with their informal carer(s), to self-manage their care, engage in shared decision-making, and to live independently for longer in their own homes. This first phase of the Smart Dementia Care project has focussed on researching and developing visual computerized support for planning and monitoring individual care goals for PLwDs. This phase involves three parts: 1. Development of a conceptual model that associates goal types with ADLs and meaningful activities as defined by PLwDs, to create taxonomies of activities that can be undertaken to improve quality of life. 2. Interviews and focus groups with PLwDs, informal carers and healthcare professionals to understand challenges faced and requirements for a visual application to support collaborative care planning and decision making 3. Iterative co-design and usability testing with relevant end-users (PLwD/care dyads) of the digital toolkit's visual application.

Initial findings from thematic analysis of the interviews and focus groups point to three key emergent themes: the importance of retaining a sense of self and purpose for PLwDs and the need for strategies to achieve this, the relationship between proxy-report and shared decision-making and the need to find the right balance, and the importance of collaboration with regard to care and activity planning in order to prevent a sense of learned helplessness. Co-design workshops with PLwD/carer dyads are currently being carried out to further expand on these initial themes and to explore how engagement in activities can be maintained, with a view to designing a

toolkit that can support PLwDs and their informal carers to set, track and achieve goals around ADLs and other activities considered meaningful or significant to the individual, while also allowing for shared decision-making around care-planning. The final toolkit will also include sensor devices for tracking goals or monitoring certain aspects of health and wellbeing (e.g., physical activity or sleep). The toolkit will be evaluated with six PLwD/carer dyads in their homes from early 2023.

ID: 17

Imagined Speech Classification from Electroencephalography with a Features-Guided Capsule Neural Network

Authors: Massoud Khodadadzadeh [1] , Damien Coyle [1]

Affiliations:[1] Ulster University, School of Computing, Engineering and Intelligent Systems, Northern Ireland, UK

Keywords: Brain-computer interface (BCI), Capsule Neural Network (CapsNet), Electroencephalography (EEG)

Abstract: Imagined speech commands can be decoded from imagined speech modulated electroencephalography (EEG) with a range of different Deep Learning (DL) methods. Among these methods, Convolution Neural Networks (CNNs) achieved an attraction due to intuitive feature extraction and classification. However, recently Capsule Neural Network (CapsNet), as the state-of-the-art DL method, has been proposed to address the shortcomings in CNN-based models. In CapsNet architecture, instead of mean/max pooling in CNNs, an alternative Dynamic Routing (DR) is employed. To elaborate, after several convolution layers, a vector representation of neurons called capsule in the first layer is grouped in DR to form the next level capsule called parent capsule so that the part-whole hierarchical relationships are modelled. In this study, we validated prior approaches used in this field and for the first time, proposed a CapsNet-based architecture called Features-Guided CapsNet (FGCapsNet) to decode speech recordings. In FGCapsNet, we modified CapsNet architecture using multi-level feature maps. The performance of the proposed method is compared with the baselines: a feature-engineered method (regularised Linear Discriminant Analysis (rLDA) using filter bank common spatial patterns (FBCSP)) and CNN-based methods. Hyperparameter optimisation is performed using nested cross-validation (Nested-CV). Furthermore, two different scenarios for datasets are considered to evaluate the performance of the models: A different pairing of imagined-words and multiclass classification of imagined-vowels. The average accuracy results corresponding to the pairing of imagined-words demonstrated that FGCapsNet significantly outperformed Deep-CNN (>7.08%), Shallow-CNN (>8.4%) and FBCSP (>11.42%) with the chance accuracy of 50% ($p<1x10^{-15}$). Similarly, FGCapsNet achieved 39.24% accuracy compared to baselines for Transfer Learning CNN (35.4%) and non-transfer CNN (32.67%) for imagined-vowels classification ($p<1x10^{-9}$) with a 20% chance accuracy. Although an open limited speech EEG dataset is employed, this preliminary analysis highlights the potential for FGCapsNet in brain-computer interface (BCI) applications involving imagined speech decoding.

ID: 18

Immersive virtual reality for educational transition training in children with autistic spectrum disorder (ASD): A feasibility study

Authors: Stefan O'Hare [1], Siobhan Murtagh [2], George Moore [1], Mark Donnelly [1]

Affiliations:[1] Ulster University, School of Computing, Northern Ireland, UK, [2] Ulster University, School of Education, Northern Ireland, UK

Keywords: Virtual reality, human computer interaction (HCI), interaction design, ASD, educational transition, immersive training and learning

Abstract: The beneficial relationship between immersive virtual reality (VR) and affective computing continues to receive exposure in the scientific community. Advancements in head-mounted display (HMD) accessibility has driven the exploitation of this relationship towards improved scientific investigation beyond laboratory conditions. Potential application shows great opportunity in studies supporting populations with disability through scenario-based training. For those with ASD, their condition continually challenges them in daily life. Contemporary research suggests significant focus of training on this population's communication difficulties. While an important challenge, there remains a lack of exploration in more specific application such as educational transition. This gap presents opportunity for a considerate approach that capitalises on the strengths of immersive VR in conjunction with affective computing.

This research is part of a wider aim towards the investigation of machine learning in the monitoring and interpretation of human emotion, whilst accommodating data collection variance. Current work focuses on a recent feasibility study outcome. Its aim was the application appropriateness of a structured framework for enabling the monitoring of affect within immersive VR. The use case for research focused on an ASD participant sample at the stage of pre and post educational transition. This initial study focused on data collection of participant psychophysiological response to the approach and experience. Work was conducted collaboratively between two researchers from computing and educational backgrounds. This multidisciplinary knowledge facilitated the research's development process and execution.

Student participants were selected from primary and secondary education. Inclusion criteria focused on those preparing for or already transitioned into an unfamiliar school setting. The immersive experience was delivered through a HMD headset and equipment. A wristband monitoring device enabled collection of several signals. These included electrodermal activity (EDA), blood volume pulse (BVP) from photoplethysmography (PPG), skin temperature (SKT) and 3-axis accelerometery data. Considering participant needs, affective data collection during experiment procedure was limited to the wristband whilst they were immersed in VR. Participants were further exposed to a shorter version of the experience, on a laptop following VR immersion. During this, eye movement behaviour and facial expressions were captured. The overall timescale for this study was ten months, including experiment preparation, development and execution. This excludes

cleaning, analysis and evaluation of the affective data collected. This is likely to take an additional two to three months at the time of writing.

Initial observations suggest the user experience positively engaged participants. Some improvements to the approach are required to increase generalisation and support task completion. While data analysis remains incomplete at the time of writing, initial findings suggest the feasibility study's success. Specifically, the appropriateness of the approach used towards supporting ASD individuals at the stage of educational transition through assistive technology.

The success of the feasibility study acts as an important foundation into subsequent work that will further improve ecological validity, scientific rigour and affective data quality of the approach used. Many important opportunities have been highlighted, the most notable of which suggests the strengths of narrowing the gap between affective computing and immersive VR.

ID: 19

Understanding User Acceptance, Inclusion, and the Societal Impact of Digital Health Technologies

Authors: Susan Quinn [1], Raymond R. Bond [2], Mark P. Donnelly [2], Shirley Davey [3], Kyle Boyd [4], James McLaughlin [1], Dewar Finlay [1]

Affiliations:[1] Ulster University, School of Engineering, Northern Ireland, UK, [2] Ulster University, School of Computing, Northern Ireland, UK, [3] Ulster University, Ulster University Business School, Northern Ireland, UK, [4] Ulster University, Belfast School of Art, Northern Ireland, UK

Keywords: technology adoption, user acceptance, usability, digital inclusion

Abstract: It is estimated that by 2030, 1 in 6 members of the global population will be aged 60 or over. This population group is at greater risk of experiencing chronic health conditions that can impact daily living activities. The availability of smart health solutions provides an opportunity to support healthy and active ageing, however, technology adoption may be impacted by several factors including a user's willingness to accept technology, and their perception of the usefulness and usability of digital services. Moreover, a lack of digital literacy skills may also reduce the benefits of using health technology. In this work we describe the development of a Europe-wide survey that seeks opinions regarding digital health technologies, in order to better understand user needs as a predictor of user acceptance. The survey focuses on the Smart and Healthy Ageing through People Engaging in Supportive Systems (SHAPES) [1] platform. The EU funded SHAPES project is developing a large-scale, EU-standardised open platform that will provide smart health solutions for older people. The platform includes smart health devices, telehealth services, IoT platforms and predictive modelling.

The survey instrument describes the use of SHAPES digital health solutions through four co-created digital story videos that describe the lifestyle of an older person and highlight how the symptoms of a health condition (e.g. diabetes, heart failure) affect their daily activities. Each video illustrates how digital health could be used by an individual to help manage their symptoms and support their lifestyle. The survey includes questions that focus on three categories that surround technology adoption - user acceptance, digital inclusion, and the societal impact of technology.

Several of the questions are based on the Technology Acceptance Model (TAM) and focus on two factors that are often found to be prominent determinants of whether a user will accept a technology, perceived usefulness and perceived ease-of-use. Trust is often identified as a factor that will predict a user's willingness to use a technology therefore the respondents' perception of the trustworthiness of the digital health technologies is also reviewed.

Digital inclusion refers to having the skills and connectivity to use digital technologies therefore several questions focus on whether potential users would have the skills and confidence to use the technologies, and the amount of training needed.

An individual is more likely to use a digital health technology if they can perceive a health benefit(s) therefore the survey also discusses the socioeconomic benefits that may be obtained from widespread adoption of health technologies. This includes whether using the technology could sustain the independence and quality of life of the user, and the economic impact on health systems.

It is the aim of this research that the survey will uncover factors that are likely to encourage adoption of the SHAPES digital health solutions or act as barriers, hence providing vital new information into the prediction of acceptance of digital health innovations.

[1] https://shapes2020.eu/

ID: 20

SEURO Project: Co-design of the ProACT CareApp for older people living with morbidities

Authors: Sarah Tighe [1], Julie Doyle [1], Séamus Harvey [1]

Affiliations: Dundalk Institute of Technology

Keywords: digital health, co-design, older adults, chronic disease, user experience, self-management

Abstract: Background: The ProACT technology system helps older people living with morbidities (PwMs) to measure symptoms and activities related to their health and well-being, while also allowing them to share this information with their care networks (e.g., family member or doctor). User centered co-design research has been undertaken as part of the SEURO project to further design the ProACT CareApp for these older people, based on the findings from a 12-month proof of concept trial (2018-2020). This co-design process engages older adults to collaboratively work with researchers to improve the existing technology system and design new features to be added to the CareApp.

Methods: Participants are PwMs aged ≥ 65 years living with two or more of the following types of health condition: diabetes, chronic respiratory disease (e.g., COPD, chronic asthma), heart-related conditions (e.g., chronic heart disease, congestive heart failure). A series of co-design workshops were undertaken approximately once a month over a 5-month period. Each workshop focused on a particular design consideration including front end design, education components, medication management, data summary design. Interactive activities and guided discussions used in workshops were inspired by participatory design techniques to promote proactive involvement of PwM participants who would not typically be familiar with participating in design research.

Findings: Data analysis is ongoing. Preliminary findings suggest that a concise data summary designed to show a ‘month in review’ could help PwMs to communicate key up-to-date health information to their healthcare professionals- optimising time-constrained healthcare appointments. A ‘priority list’ data summary design would highlight important health issues that the PwM could utilise for subsequent goal-setting. PwMs emphasised the potential of incorporating mixed media education content within the CareApp to improve self-advocacy and communication skills, and to create a sense of a ‘collective experience’ amongst users. Examples include videos depicting communication role-play scenarios or audio recordings of ‘more experienced’ PwMs describing their own approach to self-advocacy. PwMs’ design preferences for medication management were heavily influenced by the obstacles they face in coordinating numerous medications prescribed by separate healthcare professionals. The ProACT CareApp could include a digital comprehensive medication list that is easily updated by PwMs and can be used to track daily adherence. A print function for the medication list was another design consideration mentioned to replace hand-written lists which are typically out of date or are missing key information (e.g., dosage, frequency).

Conclusion: Based on these design recommendations, an updated iteration of the ProACT CareApp is in progress. Deployment of the upgraded ProACT CareApp is planned for mid-September (2022), which will be followed by usability testing of the upgraded system prior to the SEURO Effective Implementation Hybrid (EIH) trials later this year.

ID: 21

Design of an immersive learning experience for industrial safety critical training: the iWorksafe Platform

Authors: Richard Harte

Affiliations: Learnovate , Trinity College Dublin, Ireland.

Keywords:

Abstract: Health and safety (H&S) compliance training in organisations can often suffer from a number of short-comings which can make it ineffective in terms of both positive learning experience for the learner and beneficial learning outcomes. While organisations seek to fulfil legal and ethical obligations by delivering H&S training, it is regarded by employees as time-consuming, unengaging or uninteresting, as irrelevant to the context of their workplace and the kind of work they do, and as unrelated or inconsequential to the reality of their own behaviour or the impact safety could have on their lives. In the domain of safety critical environments, such as in complex manufacturing environments or in heavy industries, where injuries and fatalities are more commonplace, H&S training takes on an extra level of importance.

Immersive learning has been shown to increase engagement and motivation of learners, by making them a more active participant in the learning experience as opposed to passively obtaining information. Compliance training effectiveness could be greatly improved through a learning approach that employs a personalised immersive learning experience, through which learners can engage more actively with the content and are provided with opportunities to both reflect on their learning and understand its impact. However, immersive technology has proven somewhat inaccessible to industries because of high-cost, difficulty of implementation, and lack of accurate organisation specific context provided by the solution. These three reasons make it easier and more cost effective for organisations to allow the inertia of traditional compliance style H&S training to dictate their L&D solutions. Learnovate proposes the design of a cost-effective, customisable, immersive learning experience platform that would allow organisations to utilise technologies like virtual reality and augmented reality. The platform seeks to combine immersive technology with real world scenarios and outcomes, real-time and personalised feedback, and serious gamified elements.

In order to define the requirements for such a platform, a rigorous research methodology was followed which involved numerous subject matter experts and end-user representatives. The challenges encountered by specific learner and customer personas were defined through the use of ‘Jobs to be Done’ workshops. A comprehensive design thinking process was then followed which asked end-user representatives to prototype various solutions in an iterative manner. The result of this process was the creation of a Minimum Viable Product (MVP) immersive learning platform named iWorksafe. The iWorksafe platform brings the learner through a personalised immersive scenario-based journey, whereby they interact with a contextually accurate work environment, and complete task and challenges

related to safety knowledge. The platform allows learners to reflect on their learning journey and consider the impact the learning has on their daily work life.

It is expected that organisations will be interested in a platform like iWorksafe, as it will allow them to take a first foray into immersive learning, without the prohibitive costs currently associated with it. This will create a positive business value impact and increase the return on investment of immersive technology, particularly for SMEs.

Irish HCI presentation titles

VR SuperGun: Interfacing 1980s Arcade Hardware with Online Virtual Reality

Author(s):
Kieran Nolan

Affiliation:
Dundalk Institute of Technology, DkIT Creative Arts Research Centre, Ireland

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Exploring Virtual Reality for Quality Immersive Empathy Building Experiences

Author(s):
Gareth W. Young, Néill O'Dwyer, and Aljosa Smolic.

Affiliation:
School of Computer Science and Statistics, Trinity College Dublin, Dublin, Ireland

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The TAC Toolkit: Supporting Design for User Acceptance of Health Technologies from a Macro-Temporal Perspective

Author(s):
Camille Nadal, Shane McCully, Kevin Doherty, Corina Sas, Gavin Doherty

Affiliation:
Trinity College Dublin, School of Computer Science and Statistics, Ireland

A qualitative exploration into personal psychological agency in Instagram use

Author(s):
Emily Ryan, Conor Linehan

Affiliation:
School of Applied Psychology, University College Cork

Supporting personal preferences and different levels of need in online help-seeking for mental health

Author(s):
David Coyle, Claudette Pretorius

Affiliation:
University College Dublin, School of Computer Science, Dublin, Ireland

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A digital platform to support self-management of multiple chronic conditions (ProACT): Findings in relation to engagement during a one-year proof-of-concept trial

Author(s):
Julie Doyle, Emma Murphy, Shane Gavin, Alessandra Pascale, Stéphane Deparis, Pierpaolo Tommasi, Suzanne Smith, Caoimhe Hannigan, Myriam Sillevis Smitt, Cora van Leeuwen, Julia Lastra, Mary Galvin, Patricia McAleer, Lorraine Tompkins, An Jacobs, Marta M Marques, Jaime Medina Maestro, Gordon Boyle, John Dinsmore

Affiliation:
NetwellCASALA, Dundalk Institute of Technology, Dundalk, Co. Louth

Designing gamified rewards to encourage repeated app selection: Effect of reward placement

Author(s):
Diego Garaialde, Anna L. Cox, Benjamin R. Cowan

Affiliation:
University College Dublin, School of Computer Science

'She's Just My Life': Digital Design to Support Women's Self-Other Care in Relationships with their Mothers.

Author(s):
Kellie Morrissey, Doireann Peelo, Steve Warren

Affiliation:
University of Limerick

Public Views on Digital COVID-19 Certificates: a Mixed Methods User Study

Author(s):
Leysan Nurgalieva, Seamus Ryan, Andreas Balaskas, Janne Lindqvist, Gavin Doherty

Affiliation:
Trinity College Dublin, Ireland

Understanding How eHealth Coaches Tailor Support For Weight Loss: Towards the Design of Person-Centered Coaching Systems

Author(s):
Kathleen Ryan, Samantha Dockray, Conor Linehan

Affiliation:
School of Psychology, Dublin City University, Ireland

Comparing Command Construction in Native and Non-Native Speaker IPA Interaction through Conversation Analysis

Author(s):
Yunhan Wu, Martin Porcheron, Philip R. Doyle, Justin Edwards, Daniel Rough, Orla Cooney, Anna Bleakley, Leigh Clark & Benjamin R. Cowan

Affiliation:
University College Dublin, School of information and communication studies, Ireland

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Digital Interventions to Enhance Readiness for Psychological Therapy: Scoping Review

Author(s):
Jacinta Jardine, Robert Bowman, Gavin Doherty

Affiliation:
Trinity College Dublin, School of Computer Science and Statistics, Dublin, Ireland

Keynotes

Prof. Harold Thimblebey

Keynote Talk: How HCI can see and solve problems of healthcare

Prof Harold Thimbleby is See Change Fellow in Digital Health, based at Swansea University, Wales. He is Expert Advisor on IT to the Royal College of Physicians, a member of the World Health Organization's Patient Safety Network, and an advisor to the Clinical Human Factors Group, and to the UK Medicines Healthcare products Regulatory Agency (MHRA).

Despite being a computer scientist, he has been made an Honorary Fellow of the Royal College of Physicians, the Edinburgh Royal College of Physicians, and of the Royal Society of Arts; he's also a fellow of the Royal Society of Medicine. He has been a Royal Society-Wolfson Research Merit Award Holder and a Leverhulme Trust Senior Research Fellow, and he is 28th Gresham Professor of Geometry.

Harold's most recent book is Fix IT: See and Solve The Problems of Digital Healthcare was published by OUP in 2021: "This is an extraordinary book: a potent and engaging compendium of revelatory stories, bold insights, wise advice, and fresh thinking." — Daniel Jackson, Professor of Computer Science, MIT.

Harold thinks HCI remains the biggest fixable hole in healthcare.

Prof. Luigina Ciolfi

Keynote Talk: "Digitally Entangled Worklives Beyond the Pandemic"

Luigina Ciolfi is Professor of Human Computer Interaction in the School of Applied Psychology at University College Cork, Ireland. An experienced scholar in Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW), she researches the understanding, practicing and designing of digital interactive systems from a socio-technical perspective, with particular interest in collaborative and participatory practices.

She was previously Professor of Human-Centred Computing at Sheffield Hallam University (UK) and Lecturer and Senior Researcher at the University of Limerick (Ireland). She has authored over 100 refereed publications and has been an invited speaker in fifteen countries. She has held numerous scientific expert roles for research agencies and funding bodies nationally and internationally.

Service highlights include: General Co-Chair, ACM CSCW 2021; General Chair, ECSCW 2017; CHI Subcommittee Chair, 2018-2019; Papers Co-Chair, CSCW 2015; Associate Editor, The CSCW Journal. Professor Ciolfi is an ACM Senior Member and ACM Distinguished Speaker, Steering Committee member of EUSSET – The European Society for Socially-Embedded Technologies, and Member of the British Psychological Society

Dr. Benjamin Cowan

Keynote Talk: Hey Google- why am I speaking like this? The need for theory in understanding our interactions with speech interfaces.

Dr Benjamin R Cowan is Associate Professor at University College Dublin's School of Information & Communication Studies in Ireland. He completed his undergraduate studies in Psychology & Business Studies (2006) as well as his PhD in Usability Engineering (2011) at the University of Edinburgh.

His research lies at the juncture between psychology, human-computer interaction and communication systems in investigating how design impacts aspects of user behaviour in social, collaborative and communicative technology interactions. Dr Cowan is the co-founder and co-director of the HCI@UCD group, one of the largest Human-Computer Interaction groups in Europe.

He is also Co-Principal investigator in the SFI funded ADAPT Centre, a world leading €90+ million Research Centre on AI driven content technologies, where he leads the Interaction and Control research strand. Dr Cowan is also the co-founder of ACM SIGCHI International Conferences Series on Conversational User Interfaces (ACM CUI). He has also been involved in the ACM CHI conference, having acted as Associate Chair (AC-2017-2018; 2021) and Subcommittee Chair (SC- 2022; 2023) of theUnderstanding People: Theory, Concepts, Methods Subcommittee.

Irish HCI symposium programme

17th (evening) - 18th November (main day) 2022

17th November 2022

On the evening before the main iHCI event, we will have a keynote lecture at 6pm on the 17th November 2022 at the School of Art (Conor Lecture theatre), Ulster University, Belfast. Whilst associated with iHCI, **this keynote is free and open to all.** Hence, **please register separately for this lecture using Eventbrite - Register Here**

6.00pm Chair: Prof. Raymond Bond
Pre-symposium Keynote: Dr Simon Leigh, ORCHA / University of Warwick, 'Can we measure the 'quality' of health apps?'

7.00pm Pizza & donuts

18th November 2022

The programme for the iHCI 2022 Symposium on Friday 18th November 2022 at Belfast School of Art (Conor Lecture theatre), Ulster University Belfast. Supported by HSC R&D in Northern Ireland.

9.00 Registration, Coffee and Scones

9.45 Symposium Opening: Dr Brian Dixon & Prof. Luke Chen, Ulster University

10:00 Welcome from Dr. Kyle Boyd / Prof. Raymond Bond

Keynote Session Chair: Dr. Kyle Boyd

10:05 **Keynote 1: Prof. Harold Thimblebey, Swansea University, 'FixIT: Digital Healthcare' (45mins)**

11:00 Session 1: **Digital Health** (15 mins per presentation slot - this includes Q&A)

Chair: Prof. Dewar Finlay

- *Camille Nadal, **The TAC Toolkit: Supporting Design for User Acceptance of Health Technologies from a Macro-Temporal Perspective**, Trinity College Dublin, School of Computer Science and Statistics, Ireland.
- *Seamus Ryan, **Public Views on Digital COVID-19 Certificates: a Mixed Methods User Study**, Trinity College, Dublin, Ireland.
- *Julie Doyle, **A digital platform to support self-management of multiple chronic conditions (ProACT): Findings in relation to engagement during a one-year proof-of-concept trial**, NetwellCASALA, Dundalk Institute of Technology, Dundalk, Co. Louth.

- *Kathleen Ryan, **Understanding How eHealth Coaches Tailor Support For Weight Loss: Towards the Design of Person-Centered Coaching Systems**, School of Psychology, Dublin City University, Ireland.
- *Doireann Peelo Dennehy, **'She's Just My Life': Digital Design to Support Women's Self-Other Care in Relationships with their Mothers**, University of Limerick

12:15 Lunch (**Poster Session - refer to appendix**)

13:15 Rapid fire round (5 minute presentations by HCI Researchers - no Q&A)

Chair: Prof. Jonathan Wallace

- *Gillian Cameron, **Developing a toolkit for the analysis of real world anonymous digital mental health intervention events**, [1] Inspire, Northern Ireland, UK, [2] Ulster University, School of Computing, Northern Ireland, UK, [3] Ulster University, School of Psychology, Northern Ireland, UK
- *Stefan O'hare, **Immersive virtual reality for educational transition training in children with autistic spectrum disorder (ASD): A feasibility study**, [1] Ulster University, School of Computing, Northern Ireland, UK, [2] Ulster University, School of Education, Northern Ireland, UK
- *Alice Tenant, **Designing accessible immersive interfaces for sensory preparedness in daily-living: Engaging autistic users**, Ulster University, Belfast School of Art & Design, Northern Ireland, UK
- *Massoud Khodadadzadeh, **Imagined Speech Classification from Electroencephalography with a Features-Guided Capsule Neural Network**, Ulster University, School of Computing, Engineering and Intelligent Systems, Northern Ireland, UK,
- *Helen Sheridan, **Exploring User's Mental Models of an AI-Driven Recruitment System Using Design Thinking Methods as an Approach to Ideating XAI**, TU Dublin
- *Ozelle Kimalel, **A study protocol to measure the variability of user testing methods in the medical device industry**, Ulster University, School of Art and Design, Northern Ireland, UK

14:00 Chair: Dr. Brian Dixon

Keynote 2: Prof. Luigina Ciolfi, University College Cork, 'Digitally Entangled Work Lives Beyond the Pandemic' (45mins)

14:45 Session 2 **Digital Mental Health** (15 mins per presentation slot - this includes Q&A)

Chair: Prof. Maurice Mulvenna

- *David Coyle, **Supporting personal preferences and different levels of need in online help-seeking for mental health**, School of Computer Science, University College Dublin, Ireland

- *Andreas Balaskas, **The Functionality of Mobile Apps for Anxiety: Systematic Search and Analysis of Engagement and Tailoring Features**, Trinity College Dublin, School of Computer Science and Statistics, Dublin, Ireland.
- *Jacinta Jardine, **Digital Interventions to Enhance Readiness for Psychological Therapy: Scoping Review**, Trinity College Dublin, School of Computer Science and Statistics, Dublin, Ireland

15:30 Coffee Break

15:45 Chair: Prof. Raymond Bond

Keynote 3: Dr. Ben Cowan, University College Dublin, 'Hey Google- why am I speaking like this? The need for theory in understanding our interactions with speech interfaces' (45min)

16:30 Session 3 **Interactive Technologies** (15 mins per presentation slot - this includes Q&A)

Chair: Prof. Justin Magee

- *Gareth W. Young, **Exploring Virtual Reality for Quality Immersive Empathy Building Experiences**, School of Computer Science and Statistics, Trinity College Dublin, Dublin, Ireland.
- *Diego Garaialde, **Designing gamified rewards to encourage repeated app selection: Effect of reward placement**, University College Dublin, School of Computer Science
- *Emily Ryan, **A qualitative exploration into personal psychological agency in Instagram use,** School of Applied Psychology, University College Cork
- *Sarah Robinson, **Rural Islandness as a Lens for (Rural) HCI**, University College Cork
- *Yunhan Wu, **Comparing Command Construction in Native and Non-Native Speaker IPA Interaction through Conversation Analysis**, University College Dublin, School of information and communication studies, Ireland
- *Kieran Nolan, **VR SuperGun: Interfacing 1980s Arcade Hardware with Online Virtual Reality**, Dundalk Institute of Technology, DkIT Creative Arts Research Centre, Ireland

18:00 Close - voting closes shortly after the last presentation

18.15. **Buffet Dinner for Registered & Invited guests** in Ulster University Academy restaurant with Irish Music. Awards for Best Talk, Best Poster and Best Rapid Fire Talk and closing remarks by Dr. Gavin Doherty (Trinity College Dublin).

Appendix: Posters

These are in addition to those mentioned under the rapid fire round.

- *Susan Quinn, **Understanding User Acceptance, Inclusion, and the Societal Impact of Digital Health Technologies**, [1] Ulster University, School of Engineering, Northern Ireland, UK, [2] Ulster University, School of Computing, Northern Ireland, UK, [3] Ulster University, Ulster University Business School, Northern Ireland, UK, [4] Ulster University, Belfast School of Art, Northern Ireland, UK,

- *Mateus Bettio Moreira, **An Evolutionary Mismatch: Designing resistance against the exploitation of our primitive minds by technology**, Institute of Art, Design and Technology
- *Sarah Tigne, **SEURO Project: Co-design of the ProACT CareApp for older people living with morbidities, Dundalk Institute of Technology**. Dublin, County Dublin, Ireland.
- *Richard Harte, **Design of an immersive learning experience for industrial safety critical training: the iWorksafe Platform**, Trinity College Dublin
- *Vivien Leigh Johnston, **A User Experience Methodological Framework and Dashboard for the Measurement and Scoring of Dynamic, Adaptive and Intelligent Aspects of a Software Solution**, [1] Ulster University, School of Computing, Engineering and Intelligent Systems, Northern Ireland, UK, [2] Ulster University, School of Computing, Northern Ireland, UK.
- *Lilian G. Motti Ader, **Identifying Design Opportunities for Digital Cues in Gait Rehabilitation**, [1] University of Madeira, Campus Universitário da Penteada, 9020-105 Funchal, Portugal, [2] ITI/LARSyS, Polo Cientifico e Tecnológico da Madeira, Caminho da Penteada, piso-2, 9050-105, Funchal, Portugal, [3] Dept. Computer Science and Information Systems, University of Limerick, Castletroy V94 T9PX Co. Limerick, Ireland
- *Maciej Hyzy, **Ways to Quantify the User Experience of Healthcare Apps**, Ulster University
- *Kate Turley, **Assessing the transparency of a visualisation platform displaying the activity of individuals with dementia who are experiencing circadian lighting**, [1] Ulster University, School of Computing, Northern Ireland, UK, [2] Ulster University, School of Nursing, Ageing and Health, Northern Ireland, UK, [3] Chroma Lighting, Northern Ireland, UK
- *Tochukwu Ikwunne, **Supporting the Design of Mobile Health Technologies for a Better User Engagement**, ADAPT Centre, Trinity College Dublin, Ireland.
- *Michael Wilson, **Requirements and design of a technology toolkit to support people living with dementia and their carers to engage in shared care planning**, [1] NetwellCASALA, Dundalk Institute of Technology, Dundalk, Ireland, [2] ASCNet Research Group, Department of Computer Science, Technological University Dublin, Dublin, Ireland
- *Lilian G. Motti Ader, **mHealth use in healthcare facilities: a review under the People-Policy-Technology (PPT) framework**, [1] Dept. of Computer Science and Information Systems, University of Limerick, Ireland [2] Lero – the Science Foundation Ireland Research Centre for Software, University of Limerick, Ireland
- *Philip O'neill, **User testing of a prototype six degrees of freedom (6DoF) Virtual Reality (VR) experience by expert user groups**, [1] Ulster University, School of Art and Design, Faculty of Arts, Humanities and social sciences, Northern Ireland, UK. [2] Ulster Screen Academy, Dean's Office Faculty of Arts, Humanities and social sciences, Ulster University, Northern Ireland, UK. [3] National Museums Norther Ireland (NMNI).

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