

iHCI 2023

Proceedings of the 16th Annual
Irish Human Computer Interaction
(iHCI) Symposium, Dundalk
Institute of Technology



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iHCI 2023 at DkIT

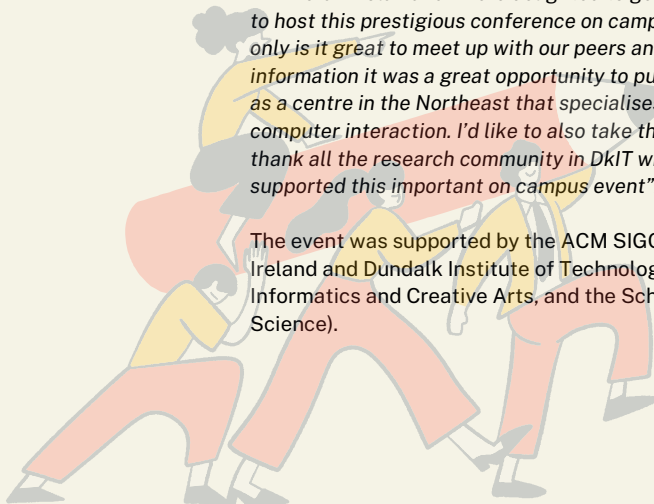
Dundalk Institute of Technology (DkIT) were proud to host the extremely well attended Irish Computer Interaction Conference on Campus on 17th November 2023. This was the 16th Irish Human Computer Interaction (iHCI) Symposium which has previously been held in universities throughout the Island of Ireland.

This face-to-face event showcased leading HCI research happening across Ireland and Northern Ireland. As in previous years, the event included keynote addresses, a paper presentation track for showcasing a selection of publications by researchers in leading HCI and related venues, a rapid-fire poster session, as well as opportunities to network. Keynote speakers on the day included Dr Dymrna O'Sullivan, Head of Research, Faculty of Computing, Digital and Data, TU Dublin and Dr Trevor Hogan a Lecturer in UX Research and Design in the Media Communications department at Crawford College of Art and Design, MTU, Cork.

Dr Julie Doyle Director, NetwellCASALA Research Centre, DkIT said:

“Dr Kieran Nolan and I were delighted to get this opportunity to host this prestigious conference on campus in DkIT. Not only is it great to meet up with our peers and share research information it was a great opportunity to put DkIT on the map as a centre in the Northeast that specialises in human computer interaction. I'd like to also take this opportunity to thank all the research community in DkIT who so actively supported this important on campus event”.

The event was supported by the ACM SIGCHI Chapter Ireland and Dundalk Institute of Technology (School of Informatics and Creative Arts, and the School of Health and Science).



SIGCHI Ireland

SIGCHI Ireland is the Irish chapter of ACM SIGCHI, the international society for human-computer interaction (HCI). It serves as a local community for researchers, designers, and professionals in Ireland to share knowledge and discuss developments in HCI through events like the annual Irish Human Computer Interaction (IHCI) symposium. The chapter was officially launched at Trinity College Dublin in 2008 and provides a forum for networking and showcasing HCI research from across the island.

Key aspects of SIGCHI Ireland:

- Community and networking: It provides a local forum for researchers and practitioners to connect and share experiences in the field of HCI.
- Annual symposium: The chapter hosts an annual Irish Human Computer Interaction (IHCI) symposium to showcase the latest research from Ireland and Irish researchers working internationally.
- Focus on HCI: The group is dedicated to the design, evaluation, implementation, and study of interactive computing systems for human use.
- Affiliation: It is a local chapter of the global ACM SIGCHI, which is the premier international society for HCI professionals.
- Research showcase: Through its events, SIGCHI Ireland highlights work published at major HCI conferences and journals, and provides platforms for presentations and posters.
- For more on SIGCHI Ireland visit: <https://sigchi.scss.tcd.ie/>



01

Keynotes

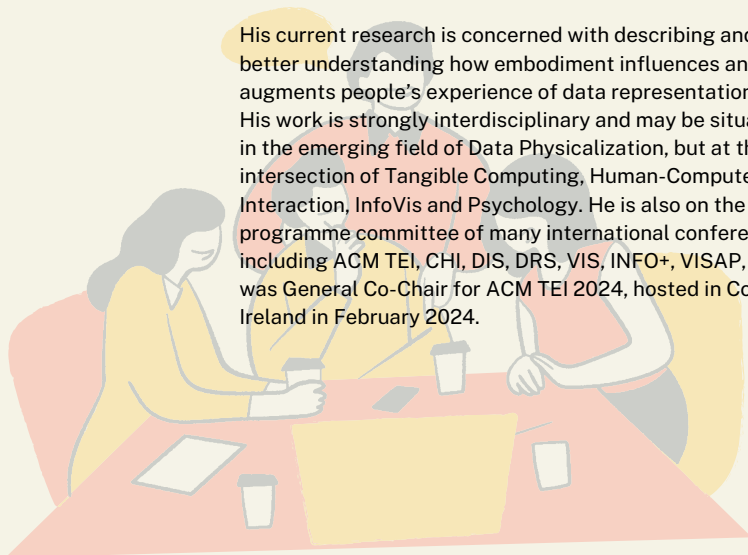


Keynote: Data on the Edge/ On the Edge of Data

Dr Trevor Hogan, Munster Technological University

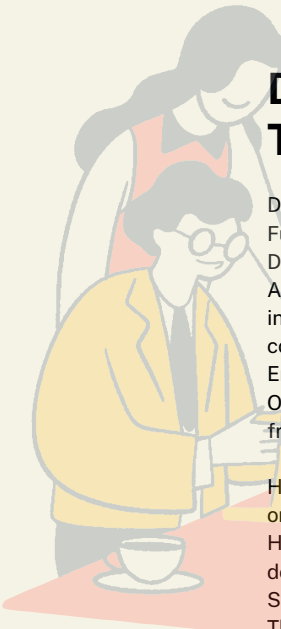
Dr. Trevor Hogan is a Lecturer in UX Research and Design in the Media Communications department at Crawford College of Art and Design, MTU, Cork. He also leads the Human-Data Interaction Group. The goal of this group is to broaden the use modalities for data representation and also to extend its evaluation criteria, design methodologies and target audience. He has a background in Ceramic Design and Interactive Digital Media and was awarded a Ph.D degree (Magna cum laude) from the Bauhaus-Universität Weimar, Germany in 2016.

His current research is concerned with describing and better understanding how embodiment influences and augments people's experience of data representations. His work is strongly interdisciplinary and may be situated in the emerging field of Data Physicalization, but at the intersection of Tangible Computing, Human-Computer Interaction, InfoVis and Psychology. He is also on the programme committee of many international conferences, including ACM TEI, CHI, DIS, DRS, VIS, INFO+, VISAP, and was General Co-Chair for ACM TEI 2024, hosted in Cork, Ireland in February 2024.



Keynote: HCI4AI: The EU AI Act and the Crucial Role of Human Computer Interaction in Developing Human-Centric AI

**Dr Dympna O'Sullivan,
TU Dublin**



Dympna O'Sullivan is the Academic Lead for Digital Futures Research Hub at TU Dublin. Prior to joining TU Dublin, she worked as a lecturer in Computer Science at Aston University in Birmingham and as a Senior Lecturer in Health Informatics at City, University of London. She completed her post-doctoral work with the Mobile Emergency Triage research group at the University of Ottawa. She holds a BSc and PhD in Computer Science from University College Dublin.

Her research is in Applied Social Computing with a focus on Health Informatics and Computing Ethics. In terms of Health Informatics, her research interests include the design, development and evaluation of Decision Support Systems to support clinician and patient decision making. This work involves research across many aspects of the domain including electronic and personal health records, machine learning and intelligent algorithms, explainable AI, sensors and smart home technologies and accessible user interfaces.

In terms of Computing Ethics, her research is focused on studying the societal impacts of emerging technologies and includes topics such as data ethics and privacy, artificial intelligence including fairness, transparency and bias implications of AI, pervasive technologies as well as relevant governance and legislation.



02

Paper Presentations



Extended Reality, Augmented Users, and Design Implications for Virtual Learning Environments.

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<https://ieeexplore.ieee.org/document/10305947>



Signal to Noise Loops: A Cybernetic Approach to Musical Performance with Smart City Data and Generative Music Techniques.

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<https://direct.mit.edu/leon/article-abstract/56/1/87/112358/Signal-to-Noise-Loops-A-Cybernetic-Approach-to>



“Listen to Music, Listen to Yourself”: Design of a Conversational Agent to Support Self-Awareness While Listening to Music.

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<https://dl.acm.org/doi/10.1145/3544548.3581427>



Patient acceptance of self-monitoring on smartwatch in a routine digital therapy: A mixed-methods study.

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<https://dl.acm.org/doi/10.1145/3617361>



Responsible Human-AI Interaction Design in Digital Healthcare.

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<https://www.jmir.org/2023/1/e43051/>



Exploring participants' representations and shifting sensitivities in a hackathon for dementia.

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<https://dl.acm.org/doi/10.1145/3544548.3581427>



JournalMate: An Accessible Academic Reading Tool for Third-Level Students with ADHD.

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<https://ebooks.iospress.nl/volumearticle/63849>



Usability Scale Benchmarking for Digital Health Apps: Meta-analysis.

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<https://mhealth.jmir.org/2022/8/e37290>



Integrating Fairness in the Software Design Process: An Interview Study With HCI and ML Experts.

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<https://ieeexplore.ieee.org/document/10078394>



Exploring the Integration of a Patient Generated Health Data in a FAIR Digital Health System in Low-Resourced Settings: A User-Centered Approach.

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<https://dl.acm.org/doi/10.1145/3628096.3629059>



Feel the Music! — Audience Experiences of Audio-Tactile Feedback in a Novel Virtual Reality Volumetric Music Video.

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<https://www.mdpi.com/2076-0752/12/4/156>



Patients' Experiences of a National Patient Portal and Its Usability: Cross-Sectional Survey Study.

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<https://dl.acm.org/doi/10.1145/3544548.3581427>

03

Poster Abstracts



An Exploration of the Potential Contribution of Mobile Health Apps in Older Outpatients' Cardiac Care.



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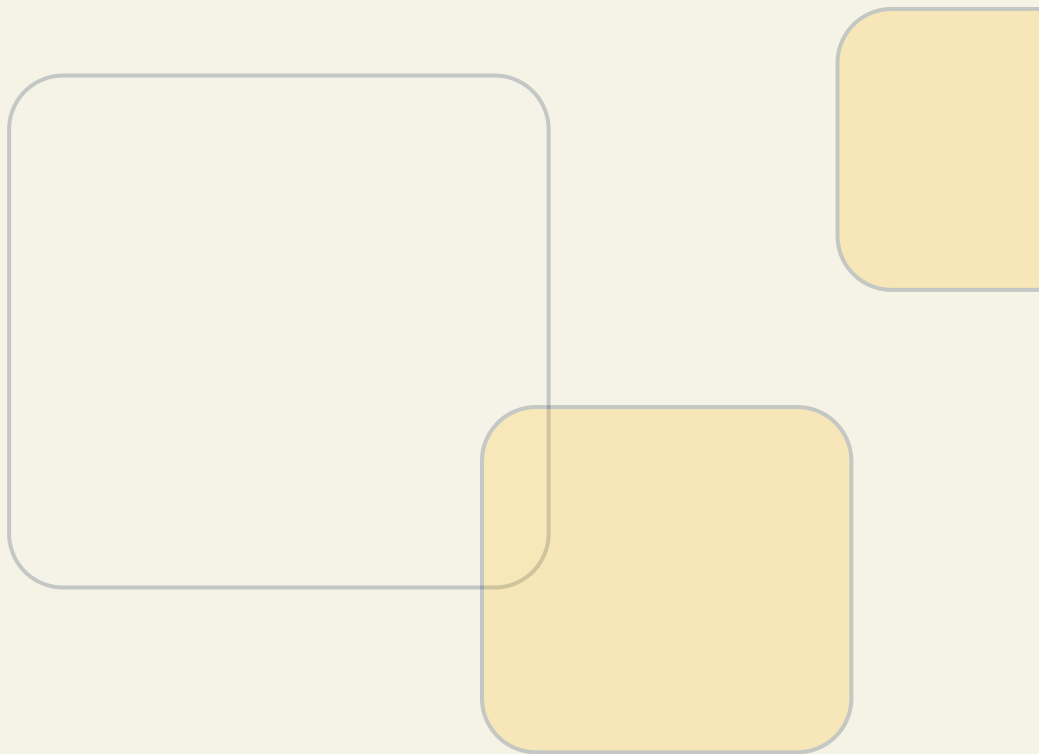
Abstract:

Yohanca Diaz-Skeete, Lucia Carragher, Natacha Carragher, 1etwellCASALA Advanced Research Centre, DkIT, Ireland. National Drug and Alcohol Research Centre, University of New South Wales, Sydney, Australia. Alcohol, Drugs and Addictive Behaviours, Department of Mental Health and Substance Use, WHO, Geneva, Switzerland. Corresponding author email address: yohanca.diaz@dkit.ie

Background: Heart Failure (HF) is increasing globally, and is the only cardiovascular disease currently increasing in Europe. In Ireland, it is estimated that around 10% of 75-84-year olds have HF, rising to 15% in people 85+. The progressive use of multiple drugs is common for HF patients. Concerns have been growing around polypharmacy, particularly management of HF by older people at home. Medication non-adherence and medication errors are common for older HF patients.

Methodology: A systematic search of apps was conducted to identify commercially available apps with a medication functionality, followed by an evaluation of apps using a validated tool. The optimal app was selected and implemented in a three-month intervention with patients attending the HF clinic. Observations of clinical practice were conducted followed by semi-structured interviews with healthcare professionals (HCPs) and patients pre-and-post intervention. A case study strategy was used to present the experiences and opinions of HCPs and patients using the app. Results: Patients found the app easy to use after training and to be effective for medication management at home. They also reported a higher medication adherence and were more familiar with their medication name, dose and frequency. The data entered in the app can be shared easily and in a timely manner.

This functionality was found to be useful by HF nurses during consultation. Patients shared an up-to-date medication list, reducing medication and dosing errors. The app most used functionalities by patients were medication reminders, medication history logs and vital parameter tracking. Conclusions: The use of a medication app to assist older people with HF in maintaining an up-to-date medication list was beneficial to both HF nurses and patients. Incorporating apps in HF care would require the Health Service Executive to be prescriptive in recommending specific app(s). Funding acknowledgement: This study was funded by the Eastern Corridor Medical Engineering Centre (ECME) and by the Higher Education Authority (HEA).



Is There Evidence That Playing Games Promotes Social Skills Training for Autistic Children and Youth?

 **Orla Walsh, University College Cork.**
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Abstract:

Abstract:

The present review provides an examination of published literature on the use of games as a social skills intervention for autistic youth. There is increasing interest in the use of games to scaffold social skills training for autistic children and youth. However, there is no consensus on how to best approach the design of such interventions. Therefore, this paper presents a systematic scoping review of empirical studies that use games as social skills interventions for autistic youth. We set out to describe the different types of game-based interventions observed, to identify those that typically bring successful outcomes, to note the social skills targeted in each, and the psychological intervention approach. We have also looked at whether research is representative of gender diversity amongst participants, and neurotype diversity amongst researchers.

Five databases were screened. PsychInfo, EBSCO, SCOPUS, Web of Science, and PubMed. Such provide data across social sciences, and human computer interaction. 3, 070 studies were initially identified, cut down through screening to a final sample of 17 studies. The eligibility criteria for the studies was determined according to the SPIDER model. Each study reported that their game successfully promoted social skills training for autistic people. However, across the sample, there was also a lack of specificity in how “social skills” were defined and in which skills were chosen as the focus of the intervention. Additionally, it was observed that researchers exhibited a limited level of reflexivity in their approaches to defining social skills. Furthermore, in the design process, there was often a missed opportunity to recognize and include the valuable insights and perspectives of autistic individuals. Moving forward, we recommend a more theoretically driven approach to defining behavioral targets for game-based interventions, the inclusion of autistic voices earlier and more centrally in the design processes and addressing the gender imbalance in autism research.

Tailoring the Fight Against Misinformation: The Personalised Adaptive Inoculation Framework.



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Abstract:

Social media serves as a potent channel for quick and broad dissemination of information. However, this advantage is counterbalanced by the prolific spread of misinformation, which poses detrimental consequences ranging from simple misunderstandings to serious public health risks. While prior research has offered various strategies to counter this problem, these solutions have often employed universal, one-size-fits-all interventions. These generic interventions fail to account for the intricate and varied characteristics of social media users, leaving a substantial gap in the effectiveness of such approaches.

To address this lacuna, we introduce the Personalised Adaptive Inoculation (PAI) framework, a novel model that aims to customize interventions by leveraging the specific traits and behaviours of individual users. Unlike traditional approaches, PAI gathers a rich set of user data to create a comprehensive model that encapsulates both explicit and implicit features. Explicit features include attributes like personality traits, cognitive biases, and digital literacy, which are extracted from user-provided questionnaires. Implicit features, such as sharing patterns, engagement with different types of content, and interaction behaviours, are inferred through machine learning algorithms that analyze social media activity. PAI employs this personalised model to categorize users based on their vulnerability to misinformation into low, medium, or high-risk groups. This information guides the selection of an optimal inoculation strategy from an extensive repository of interventions designed to bolster information literacy and critical thinking.

These interventions combine educational messaging with preemptive refutation, aimed at enabling users to more effectively scrutinize and question misleading information they encounter. An adaptive interface then delivers these targeted interventions to users, thereby augmenting their resilience against misinformation. The PAI framework significantly advances the field by moving beyond universal solutions that do not consider the complex array of factors that make individuals susceptible to misinformation. It aligns with a growing body of research suggesting that personalised applications often outperform generic counterparts, especially in the context of persuasion — which is the underlying tactic of misinformation campaigns. While the PAI framework is currently conceptual, empirical validation is crucial for its future development. Creating a robust dataset, featuring detailed characteristics of users, their behaviours across various social media platforms, and a representative sampling of misinformation, will be pivotal for thorough testing. By spearheading the exploration of tailored inoculation strategies, PAI aims to significantly elevate the effectiveness of interventions and empower users with personalised tools for combating online misinformation.

Remotely Delivered and In-Person Cardiac Rehabilitation Exercise – A Comparison of the Subjective and Objective Outcomes.

 Oonagh Giggins, NetwellCASALA, Dundalk Institute of Technology.

Abstract:

Cardiac rehabilitation (CR) is recognised as a core component of cardiovascular disease (CVD) management. New models of CR, using information, communication and digital technologies have been proposed to engage and motivate more patients to participate. ECME-CR is a digital health platform designed to support CR exercise and enhance uptake. A mixed methods pilot trial was conducted to evaluate the ECME-CR platform and compare outcomes between those participating in an online CR exercise (CRE) program to those in a control group who participated in a traditional in-person exercise class.

Both groups performed the same 8-week exercise program. Objective outcomes were assessed at baseline and repeated following the intervention period, with the primary outcome being exercise capacity, which was assessed using a six-minute walk test (6MWT). In addition to clinical outcome measurements, qualitative interviews were conducted with participants enrolled in the trial. In this paper, we integrate the quantitative outcomes with participant qualitative reports, to examine the difference between objectively measured outcomes and participant perceptions of benefits and improvements gained from participation in the CRE program.

Regarding 6MWT distance, the primary objective outcome measure, only five participants in total demonstrated a clinically meaningful improvement following the 8-week CRE program. However, most participants reported improvements in their physical or mental health and wellbeing following participation in the program. The findings from this study may offer a useful starting point for further study of community-based, phase IV CRE and also highlight the benefit of adopting a mixed methods approach which considers both the objective outcomes measured as well as the subjective reports obtained from participants.

Health Apps: Challenges and Recommendations.

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Abstract:

Currently there are more than 350,000 health apps in the app stores. However, with new technology comes new challenges and to ensure that health apps are effective and safe to use, they should be assessed for quality. The objective of this study was to identify challenges with the use of health apps and review recommendations on how to deal with those challenges. Reviewing the current literature showed that health apps have challenges associated with their use and their quality. The current challenges for health apps include: validity, usability, technology, use and adherence, data privacy and security, patient-physician relationship, knowledge and skill, individuality, implementation, and costs. When a user makes a choice regarding what health app to use, it can be challenging to keep in mind all the risks associated with the use of a health app. There are ways to mitigate the challenges and risks associated with selecting health apps.

Health app libraries, such as ORCHA library or M-health index and navigation database (MIND), can be used to select health apps that have already been assessed for quality. Allowing users to check how well each health app adheres to best practice standards may currently be the best way to select high quality health apps. Other ways of selecting quality health apps include app recommendations from health experts or NHS staff. Looking for evidence of quality assessment or health experts' involvement in health app development may indicate that the health app is of good quality. Previous research has shown that the number of days since an app was last updated is correlated with the quality of apps, however, there is no guarantee that this is always the case. Health apps that have not been updated for more than 180 days, scored significantly less on quality assessment. Aforementioned solutions to mitigating the risk of health apps address only three out of ten challenges mentioned (validity, usability, and data privacy and security). As a result, more research and consideration is needed to facilitate the adoption of high quality health apps that are effective and safe to use.

Everyday moments that make or break recruiting postgraduate academics with dyslexia in HCI studies: Learning to unlearn.

 **Eileen Healy. University of Limerick.**
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Abstract:

Human-Computer Interaction (HCI) has a duty to listen to unheard voices. Capturing the viewpoints of those unique voices, however, is not as simple as it seems, but it is critical to learn lessons and own unlearned lessons. Relying on traditional methods may not be the best way to recruit participants in sensitive HCI studies. To provoke new thinking, one perspective is to unlock and listen to those invisible voices that often go unheard. Providing a means of seeing behind the paradoxes and highlighting the struggles of academics with hidden disabilities and poorly understood experiences. Understanding individual lived experiences is an attempt to learn a better way of recruiting academics with dyslexia to prevent the exclusion of voices explicitly in the Universal Design (UD) conversations about the 'Equitable Use' principle and the guidelines to 'avoid stigmatising or segregating any users'.

To help break down barriers and encourage fellow scholars to tell their stories, I openly disclose my dyslexia and dyscalculia. Having an open dialogue may bring new understanding to the table. Because most adults with dyslexia choose non-disclosure in the workplace for fear of stigmatisation and discrimination (Shaw and Anderson 2017; Macdonald and Cosgrove 2019). It is also suggested that perceived stigma is associated with assistive technology use (Schröppel et al. 2021; Tsatsou 2021). After trying many recruitment methods grounded in traditional ideas, such as advertising on academic research platforms, directly emailing independent postgraduate academics and professors with dyslexia who openly disclose on blogs and engaging with university disability support services, all ended in poor responses. Thus highlighting the missed opportunities to gather nuanced understanding and insight to learn lessons for the future. This has set a number of challenges for participant recruitment. In this context, it is perhaps time to quickly recognise misguided approaches to participant recruitment and retention for this specific cohort.

This research aims to build a clearer picture to find out why postgraduate academics with dyslexia are hesitant to participate and/or drop out from HCI studies – even though they confirm their intention to share their experience. Specific focus on issues relating to using mainstream technology in assistive ways for dyslexic issues and the perceived stigma of assistive technology use through gathering data by interacting with postgraduate academics with dyslexia over social media e.g. X (formerly Twitter) to get the inside scoop about why they choose (or not) to engage in this first step. The results will outline a few lessons on why academics with dyslexia are doing this. By using this strategy, it is possible that postgraduate academics with dyslexia could engage more in HCI studies, and their own thoughts could be used to refine these strategies. The outcomes may help researchers rethink how to recruit participants in sensitive HCI studies.

References:

Macdonald, S.J. and Cosgrove, F. (2019) 'Dyslexia and policing: Understanding the impact that dyslexia has in the police service in England and Wales', *Equality, Diversity and Inclusion: An International Journal*, 38(6), 634-651, available: <http://dx.doi.org/10.1108/EDI-11-2018-0218>.

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Tsatso, P. (2021) 'Is digital inclusion fighting disability stigma? Opportunities, barriers, and recommendations', *Disability & Society*, 36(5), 702-729, available: <http://dx.doi.org/10.1080/09687599.2020.1749563>.

The Role of Telephone Triage Nurses in Supporting People with Multimorbidity to Digitally Self-Manage their Health.

 **Patricia McAleer, NetwellCASALA, Dundalk Institute of Technology.**
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Abstract:

Background: Remote monitoring of health and well-being is increasing, and is being driven by an ageing population who frequently live with chronic illnesses. 50 million people in the EU live with multimorbidity (the presence of two or more chronic diseases), the risk of which increases with age. Multimorbidity imposes a significant burden on those who live with it. That burden includes symptom monitoring, attending multiple medical appointments, managing numerous medications and following contradictory lifestyle advice. Further, the cost and complexity of managing multimorbidity to healthcare systems, and shortages of medical staff, necessitate digital solutions to support people aged 65+ years to self-manage their illnesses. However, older people with complex conditions can experience challenges in using digital technology: human support from a nurse-led telephone triage monitoring service offers a potential solution.

Aim: To explore the role of a nurse-led telephone triage service in supporting digital self-management of multimorbid conditions.

Method: This PhD research project was part of the larger SMILE project undertaken in the South-East of Ireland. Due to Covid-19 restrictions, one focus group on Zoom was conducted with three telephone triage nurses (TTNs), and telephone interviews were conducted with a sub-set of 10 older people with multimorbidity (PwMs). Qualitative data were thematically analysed using Nvivo 12 software. Findings: Six themes relating to participants' experiences of being supported by TTNs to use digital technology emerged: (i) the impact and challenges of multimorbidity; (ii) engagement in self-management; (iii) the relationship between PwMs and TTNs; (iv) the role of the TTNs; (v) technology; and (vi) the benefits of the SMILE programme. Conclusions and implications: The relationship between TTNs and PwMs, and the motivating effect that the TTNs had on participants is important in enabling engagement with digital self-management. Further research will assess digital engagement between two groups: those with support from TTNs and those without it.

Funding acknowledgement: PhD funding granted under Landscape Funding.

Exploring the Potential of Augmented Reality and Generative AI and Their Potential To Add Enhanced Consumer Appeal in Interaction With Printed Textiles Fashion Accessories.

 **Jacqueline Toal, Dundalk Institute of Technology.**
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Abstract:

Generative AI(Artificial Intelligence) for Fashion and textiles is on the rise and has the “potential to affect the fashion ecosystem....including increasing sales and customer satisfaction” (1) and marketing. Augmented reality can create curiosity and stimulate stronger emotions in customers adding to enjoyment and positive experiences (2). So the purpose of this research is to explore the potential of Augmented Reality and Generative AI for luxury bespoke fashion accessories and to assess the impact on a user-consumer experience. It aims to present an idea of adding wearable animated narratives of virtual nature to a fashion artifact to investigate if this could potentially add value, enhance digital commerce and retail. It will seek to combine an emotional connection via nature in surface pattern printed textiles with augmented reality and AI.

This exploration aims to increase consumer interest, interaction and engagement between a traditional artifact (silk scarf surface pattern design) through human computer interaction(HCI) with prototyping of augmented reality and a Generative AI overlay. It intends to use and generate emotion using visual and audio stimulus to engage the consumer to help make product more memorable (3). Nature from Irish countryside was the inspiration for developing the creations of the surface pattern prints.

Methodology: A design thinking approach was adopted researching firstly current trends, users, then developing the designs using a combination of both traditional and digital tools. The surface pattern prints have been created in Adobe Photoshop and then digitally printed onto silk to be more environmentally sustainable. The use of Generative AI tools Mid Journey, Runway, Dall-e are used to develop the virtual nature narrative overlay. With development of Web AR the choice of 8th Wall was adopted as this is quite accessible to the user via a smart phone without any need to download an app, it is also cross platform (IOS and Android). The target audience are female adults and a small sample used, their behavior analyzed from feedback from semi-structured interviews using mainly qualitative data.

Key words: surface pattern print, HCI, AI, AR, fashion accessories, e-commerce

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(3) Kim, YK., Sullivan, P. Emotional branding speaks to consumers' heart: the case of fashion brands. *Fash Text* 6, 2 (2019). <https://doi.org/10.1186/s40691-018-0164-y>

They Followed The Cheese: Visual experiments showcasing the opportunities available for the presentation of information in AR.

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Abstract:

The desktop paradigm bridged a sizeable usability gap at a time before the term “usability” became a conscious objective goal of developers. Mapping the capabilities of the computer to how a user understands their work desk, helped users understand how to interact with a computer. The Desktop was the first major graphical user interface (GUI) that enabled more users to use computers, by utilising a tangible metaphor. The paradigm evolved and was appropriated by software and web design and continues to evolve and reshape itself in different platforms such as the mobile space, as users learn new ways to interact with the range of different screen based devices. As the screen and input devices have evolved, so too have the users who have experienced and learned through the different iterations that allow users to interact with highly polished and sophisticated user interfaces (UIs) across a number of different devices. While the UIs have evolved it still relies heavily on established laws and principles that suit the conditions of screens.

But what happens when you remove the screen? With screen-less UIs becoming more prevalent with technologies such as gesture UIs, voice UIs, Augmented Reality (AR), Virtual Reality (VR) and immersive environments what baseline visual communicators have the potential to help users navigate information in these spaces. In particular, AR has the opportunity to utilise context relevant UIs that rely on the focus of the real-time view to inform the user. While this sounds interesting it is an approach outside of the established design patterns that may cause frustration for both the designers and the users. It is an area that needs defining and experimentation, to find levels of communication that work for AR. This poster presents a screen based visual experiment that posed the question; can simple visual cues change the user's interaction behaviour with a system. If so, is there a threshold between the communication value of different visual cues and their compositions, where no behavioural change can be identified. The experiment utilised a number of visual communication theories in the creation of the visuals used in the experiment. The results include findings that suggest a willingness in the evolution of the user and their perception of visuals and the influence they can have over established mental models.

Pedagogical Agents: Transforming Mathematics Education for All.



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Abstract:

A pedagogical agent (PA) is an animated interface within an interactive online learning environment that guides users through instructions and engages in face-to-face discussions (Martha & Santoso, 2019; Castro-Alonso et al., 2021). Several studies have shown the value of pedagogical agents in education. These virtual interactive tools provide a dual role not only in teaching but also in differentiating learning to foster inclusivity (Schroeder et al., 2013). They can potentially support students with specific learning needs, such as vision-impaired and dyslexic students (Moreno et al., 2001; Goenka et al., 2021). Technology integration is essential in the educational environment, and one area where this integration is greatly beneficial is mathematics education.

The poster underlines the promising area of developing interactive multimodal pedagogical agents (PAs), which can combine visual and audio elements to facilitate a deeper understanding of mathematical concepts. These PAs have the potential to adapt to the different learning needs of students, making mathematics more accessible and engaging. The authors explore enhancements that can be incorporated into PAs to make them even more suitable for assisting students with learning disabilities (e.g., dyslexia) or sensory disabilities (e.g., vision impairments). The poster highlights the importance of Human-Computer Interaction (HCI) in shaping the design and functionality of PAs, ensuring that they are not just technologically advanced but also genuinely helpful to those who need them.

PA aims to integrate artificial intelligence (AI) into classrooms to enhance vision-impaired and dyslexic students' engagement and motivation during mathematics learning. Technology has become a more influential part of our lives, making education better for everyone. These improvements in teaching tools are changing how we learn, making education more equitable for everyone.

Design and development of an activity-planning mobile app for people living with early-stage dementia.



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Abstract:

Dementia is a progressive and degenerative disease, characterized by cognitive limitations and degradation of everyday practical capabilities, which impact on the person living with dementia's (PLwD's) ability to access, process or remember information. There is increasing recognition that those particularly in the early stages of dementia have many years in which they can live meaningful lives while managing their condition. A key element of maintaining quality of life is the ability to engage in both independent activities of daily living (IADLs), as well as other meaningful activities that help promote health and mental well-being (e.g., social occupations, intellectual pursuits, recreational pastimes).

This 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. User-centred research and design activities have been carried out to support the development of a digital application for planning and monitoring personalised care goals, engaging in daily and meaningful activities, and encouraging and facilitating shared decision making. Initial interviews were conducted with three cohorts: PLwDs, informal carers, health professionals. Following this a series of co-design sessions were held with three PLwD/carers dyads to further explore the themes identified from the interviews. Parallel to this, a comprehensive list of daily and meaningful activities was developed and further refined in collaboration with health professionals who work with PLwDs. This involved adapting and expanding existing scales used to measure engagement in IADLs and meaningful activities, as well as categorising each activity according to skill, theme, potential to support and maintain another IADL, and cognitive domain. This categorisation was conducted in order to inform a computational model which would allow for suggested replacement activities in the event of a user no longer engaging in a particular activity, either through declining ability or lack of interest.

The goal in this case is to encourage the user to explore a new activity which closely matches the lost activity with regard to each of the categories, thereby limiting the potential loss of any skills or abilities associated with that activity. From here an interface was designed which incorporated the ability to set, track and achieve goals around IADLs and other activities considered meaningful or significant to the individual, while also allowing for shared decision-making around care-planning. As well as this, educational information was provided on each activity and the potential benefits of engagement, along with more general wellbeing education for both PLwDs and informal carers. These designs were then used for six individual usability testing sessions with people living with dementia, older adults with a mild cognitive impairment, and older informal carers. Feedback from these sessions was analysed to allow for further refinement to the overall designs. The final version of the mobile application is due to be trialled with six PLwD/carers dyads in their homes for six months commencing in late 2023.

Technology as a Language (TaaL): Older Adult Perception of Value and Sharing Patient Generated Health Data.



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Abstract:

Patient Generated Health Data (PGHD) which refers to data that is generated or gathered from a patient outside of the clinical settings are increasingly becoming important to attain a complete view to health diagnosis. Many studies have concluded that PGHD portends great opportunities for the individual and public health. In this study, we seek to understand the older adults' experiences and perception of sharing PGHD with health professionals. Using a Focus Group Discussion approach, the study explores older adults' perception of sharing personal health information outside a health facility.

Our preliminary findings reveals that most participants think that sharing PGHD is valuable for personal, public health (for national and cross border) use, and community good (research), given that appropriate security will be in place. They expressed delight that PGHD (wearable data as an example) is able to support them during clinic visits to assist in recalling information, and that helps them to age positively. However, they had express significant concern about how technology is not well introduced to them, with lots of misconceptions and assumptions made which makes it difficult for them – some participant opined that they have simply missed the boat (i.e it is not meant for them). Also, a lack of friendlier support system that makes them lose interest was reported as a factor - they likened it to a 'good language' which needs to be learnt.

There is also some interest about agency, and how they will prefer to be able to do things on their own over a period of time (self-paced), stating that the younger family members or people around them are sometimes 'impatient' to educate them well on these tools or technologies. In addition, implicit and explicit cost of the technologies, were factors shared as barriers to sharing PGHD, given that most of them are living on a fixed income / retirement budget.

Human-AI Collaboration for Sustainable Security: Opportunities and Challenges.



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Abstract:

As digital technology continues to advance, the proliferation of cyber-threats and attacks targeting individuals or organizations also increases in both quantity and complexity. To tackle this challenge, AI-powered autonomous and adaptive security approaches, such as self-protecting software systems, and autonomous threat detection have been proposed to enhance the security of systems with minimum human interaction. However, to establish a resilient and sustainable security ecosystem, we rely on different stakeholders to contribute their efforts at different stages of securing systems. For example, during the system development phase, software developers are expected to integrate security within the development lifecycle and implement correct security controls that address the root cause of existing vulnerabilities (secure development). At run time, end users are expected to behave securely such as using a secure Wi-Fi connection and making a secure mobile payment (secure interaction).

Moreover, maintaining system security requires security professionals to detect potential threats, respond to incidents, and protect critical assets and data from potential breaches. Instead of viewing “human as problem”, it is suggested to consider “human as solution” and use AI to augment human capability in implementing security measures and improve resilience. In recent years, HCI researchers have studied human-AI collaboration (i.e., the use of AI to empower people) in different domains, e.g., data science, user experience evaluation and qualitative analysis, suggesting the potential to increase people’s productivity in their tasks. Yet, little research has investigated the collaboration between humans and AI to maintain sustainable security. Drawing on previous research on human-AI collaboration, we believe AI can act as a collaborator to augment multiple stakeholders’ efforts in safeguarding systems against threats at different stages, including secure development, secure interaction, and incident response.

AI can also act as an educator to provide educational training and guide stakeholders to implement sustainable security practices, so as to create a resilient and sustainable security ecosystem. In this poster, we review what we know about sustainable security, and discuss the potential of human-AI collaboration for ensuring sustainable security, as well as the opportunities and challenges of empowering different stakeholders in implementing security practices. We hope this may stimulate further discussions surrounding human-AI research for maintaining sustainable security.

Sharing, Support-Seeking, and Managing Safety: A Qualitative Study of Online Platform Engagement After Pregnancy Loss.



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Abstract:

As pregnancy loss has been associated with various psychological difficulties, including anxiety, trauma, and depression, it is important for those that experience pregnancy loss to be properly supported during this time. However, research has shown that locating support after pregnancy loss can be difficult, due to the societal stigmatisation of the experience. In this case, past studies have shown that online social platforms (i.e. social media, online forums, online groups) can serve as valuable resources for individuals to seek social support, to share their experiences, and to find relevant information following pregnancy loss. However, while this research has provided insights into user experiences on specific platforms, such as Facebook and Instagram, we currently lack an understanding of how users manage their engagement with multiple different platforms after pregnancy loss.

Therefore, this study aimed to understand contemporary online platform experiences after pregnancy loss, by examining how users manage their engagement with multiple online platforms in order to meet their specific needs. By administering a qualitative online survey and conducting semi-structured interviews focused on this topic, we recruited 92 total participants who had experienced pregnancy loss. A reflexive thematic analysis was then conducted to analyse this data. Our findings show that participants were thoughtful and strategic in their engagement with online platforms, as they actively worked to locate relevant pregnancy loss content, to share loss-focused content only with desired audiences, and to find safe online pregnancy loss spaces/groups.

However, we also found that despite their careful navigation of online platforms, users still struggled with issues related to algorithm-driven content, online toxicity, and discomfort within online pregnancy loss spaces. Reflecting on these findings, we discuss how the study has built upon past research in the area, by providing an extensive insight into how individuals choose to engage with different online platforms after pregnancy loss. Additionally, we consider how the existing challenges experienced by this population can be addressed in the future, as we outline potential implications of the work for supporting safer online platform engagement after pregnancy loss.

User-centred design of a VR based rehabilitation system- A preliminary study to overcome the barriers of rehabilitation from Anterior Cruciate Ligament Reconstruction.

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Abstract:

In Ireland, team-based sports such as Gaelic football, soccer, hurling/camogie, and basketball are the most popular among the population. The second most common reason to stop participating in competitive sports is incurring injuries while playing. This is not surprising given that the aforementioned sports require sudden changes of direction that can result in an Anterior Cruciate Ligament (ACL) injury, a type of injury that can keep an athlete off the field for several months and even permanently. Normally, athletes go through an ACL Reconstruction surgery (ACLR), followed by physical therapy and a rehabilitation programme. Completion of the prescribed Home Exercise Programme (HEP) is essential for regaining strength and Range of Motion (ROM) of the knee, so the athlete can return to pre-injury levels. However, studies have shown that between 50-70% of patients never complete their HEP. This is a result of different barriers that the patient faces in the process of rehabilitation.

These can be psychological (false expectations, fear of reinjury, lack of motivation, feelings of isolation) or physiological (pain level, age), combined with situational barriers (access to services). Ways to overcome these barriers are a key to the successful recovery of athletes. Gamification is a way of incorporating game-like characteristics to situations and tasks that would normally not include them. The tendency to add game dynamics to activities such as physical rehabilitation can help patients to engage more in their recovery process by completing their rehabilitation program. Some studies have identified different factors that influence engagement in a rehabilitation programme in patients with ACLR. Based on these factors, we have selected the following as goals to create a user interface to tackle: Kinesiophobia, lack of motivation (boredom), unclear instructions, and failure to see progress. We are following a user-centred design approach to iterate the design of a virtual reality home rehabilitation system.

The application in the virtual environment consists of an open field scenario, and a set of games that will guide the patient to perform certain exercises, making the exercises more natural by using an immersive environment that simulates a real training session. The exercises include side to side movements (to simulate sudden changes of direction), lunges (to strengthen the knee), and acceleration and deceleration (to simulate rapid changes in movement). At the current stage of research different options for the gamification of these exercises are being designed with a physiotherapist. The needs of the clinician and patient are being taken into account to determine the requirements for kinematic sensing.

Given that a commercially available VR headset does not track full body measurements, we have incorporated the use of wearable devices (Inertial Measurement Units, foot pressure sensors) that will help us measure ROM, smoothness of movement, and the load on the injured leg. These are parameters necessary for the physician to assess the progress of the patient and their readiness to go back to sports. A prototype VR environment has been created to get feedback on the design, and ethical approval has been granted to start trials with the VR and wearable sensing systems. The first iteration of the application will be tested and evaluated by participants that have recovered from an ACL injury. By getting feedback from the users, we aim to improve our application to target the real needs of the patients and to support their injury recovery plan effectively.

Exploring Inter-Personal and Intra-Personal Variance in Heart Activity as a Key Modality in HCI: Towards Personalised and Responsive Interfaces.



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Abstract:

Heart activity analysis, which involves the examination of electrocardiogram (ECG) waveforms and metrics such as heart rate variability (HRV), presents a valuable opportunity to enhance Human-Computer Interaction (HCI) systems by integrating automated psychophysiological analysis. This abstract explores the importance of inter-personal and intra-personal variance in heart activity and its implications for HCI, particularly in designing personalised and responsive interfaces. Polyvagal Theory proposes that the autonomic nervous system responds to psychological states with measurable physiological changes. As such, the connection between heart activity and psychological states becomes evident. Although previous studies have successfully detected changes in psychological states through heart activity analysis, further research needs to address the key challenge of inter/intra variance. This variance refers to the variation in heart activity and psychological states among individuals and within individuals over time, which can complicate the accurate interpretation of the relationship.

Accurate discrimination of psychological states from heart activity has considerable implications for HCI, offering a non-invasive and objective approach to gauge individual psychological responses. Integrating psychological state recognition technologies within HCI systems enables dynamic interfaces that adapt based on the user's psychological state in real-time. For example, adjusting difficulty levels or ambience following the player's detected psychological state in gaming interfaces. Heartbeat analysis can also be integrated into wellness applications, facilitating stress management, meditation, and biofeedback training. Furthermore, immersive virtual environments can dynamically adapt content based on user psychological states. HCI interfaces can assist individuals with regulating their psychological states, such as those with anxiety disorders.

Overcoming this inter/intra variance requires integrating personalised data analysis methods, machine learning techniques, and adaptive algorithms to accommodate the unique characteristics of individuals. Personalised data analysis methods allow for examining individual-level data, facilitating a deeper understanding of individual characteristics and behaviours. Researchers and practitioners can better understand the intricate patterns, behaviours, and factors contributing to the observed variances by collecting and analysing data specific to each person.

This personalised approach enables the identification of individual-specific trends and correlations that might otherwise remain hidden in aggregated analyses. Machine learning techniques further enhance the capacity to overcome inter/intra variance by leveraging the power of algorithms to learn from and make decisions based on data. These techniques should be trained on large datasets encompassing diverse populations, enabling the development of models capable of capturing the complexity and nuances of human characteristics and behaviours. In addition to personalised data analysis and machine learning, adaptive algorithms are integral to the solution. Adaptive algorithms are designed to dynamically adjust and optimise their behaviour based on feedback, changing circumstances, or evolving individual characteristics. By continuously adapting and fine-tuning their processes, these algorithms can account for the intrapersonal variance that arises as individuals change over time. This adaptability ensures the analysis remains relevant and effective even as individuals' physiology or psychology changes. Heart activity analysis offers a promising modality for advancing HCI by considering individual differences and psychological states. Interfaces that respond to users' physiological and psychological cues foster empathetic, engaging, and effective interactions.

Unlocking the Black Box: Evaluating XAI Through a Mixed Methods Approach Combining Quantitative Standardised Scales & Qualitative Techniques.

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Abstract:

In 1950 when Alan Turing first published his groundbreaking paper, computing machinery and intelligence and asked “Can machines think?” a new era of research exploring the intelligence of digital computers and their ability to deceive and/or imitate a human was ignited. From these first explorations of AI to modern day artificial intelligence and machine learning systems many advances, breakthroughs and improved algorithms have been developed usually advancing at an exponential pace. This has resulted in the pervasive use of AI systems in the processing of data. Concerns have been expressed related to biased decisions by AI systems around the processing of personal data in domains such as recruitment, medicine and the judicial system, AI systems which make life changing decisions for users. However, legislation such as the EU’s AI act has called for greater regulation of artificial intelligence in the EU including categorising according to risk, developing systems with greater transparency and the right to an explanation of AI systems’ decisions.

Explainable artificial intelligence (XAI) can be best described as a model which produces details or reasons which make the functioning of an AI system clear or easy to understand. Much research and development has been done in this area to demystify the black box nature of some AI systems. With the right to an explanation XAI will play a leading role in the compliance of high-risk AI systems for companies and in the delivery of explanations for those who engage with AI. However, when an XAI method is presented to a user how do we know that the user understands the explanation? When we factor in other metrics which might be crucial when evaluating users’ understanding of an XAI output such as; user satisfaction, user curiosity or need for an explanation, user trust in the system following an explanation and users’ mental models of the AI system we can see the multiple evaluation methods, scales and tests which may need to be considered.

Also, bear in mind the breath of user types who require explanations and the volume of domains which utilise AI in automated decision-making which may also influence the evaluation method employed.

Evaluation methods traditionally used within the IT industry for software and websites have been utilised, examined, evaluated and verified extensively. Although there are many standardised scales and evaluation methods used to evaluate software and websites such as SUS, PSSUQ and SUMI, few of these methods translate specifically to the domain of XAI. Those designed specifically for XAI such as SCS, goodness check, satisfaction scale, and trust scale have not been as thoroughly tested and validated as those for software and websites. Also, many qualitative evaluation methods such as AAR/AI, explainability scenarios and counterfactual scenarios specifically tailored for evaluating AI and XAI suffer the same fate. This is to be expected since XAI in comparison to software and websites is a relatively new field of research.

As part of a larger study, we present an overview of quantitative methods in the form of standardised scales and qualitative techniques considered user experience methods which evaluate more traditional forms of information technology such as software or websites but with an emphasis on those which are best suited and have been validated in the evaluation of XAI. We also present an overview of evaluation methods specifically designed to evaluate XAI and discuss how these might be used in conjunction with traditional evaluation methods to determine users' understanding of XAI outputs.

The Role of Artificial Intelligence in Human-Computer Interaction in Computer-Aided Laparoscopy.



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Abstract:

Computer-aided laparoscopy (CAL) has emerged as a transformative approach in modern surgical practice, offering minimally invasive procedures with enhanced precision and reduced invasiveness. As technology continues to evolve, the integration of artificial intelligence (AI) into human-computer interaction (HCI) plays a pivotal role in shaping the future of laparoscopic surgery. This poster delves into the multifaceted role of AI in HCI within the realm of computer-aided laparoscopy, exploring its impact on surgical decision-making, real-time feedback, training, and the overall patient experience. Surgical trainees can benefit from AI-based simulators and virtual reality platforms that offer realistic surgical scenarios for practice and skill development. These AI-driven training tools provide objective performance assessments, enabling trainees to hone their skills in a safe and controlled environment. The incorporation of AI-driven HCI not only accelerates the learning curve for surgeons but also contributes to standardized training practices.

The poster begins by elucidating how AI-driven image analysis and recognition empower surgeons with real-time, intelligent insights during laparoscopic procedures. Advanced computer vision algorithms, including convolutional neural networks (CNNs) and capsule networks, facilitate the automatic identification of anatomical structures, tumors, and anomalies within laparoscopic images and videos. By providing immediate, context-aware feedback to surgeons, AI enhances decision-making, reduces errors, and augments surgical precision. This aspect of AI in HCI ensures that laparoscopic surgeries remain patient-centric and outcome-driven. Images from trained models for tool detection are presented. The models can tag tools in realtime with a high accuracy. For a variety of tools used in cholecystectomy, the model has achieved a high accuracy for detecting them. The results also show the confidence of predictions. Confusion matrices for different classes of tools are shown. They show the accuracy with which certain tools were tagged and what they were normally mis-classified as. Other results related to the model are also shown.

We also show figures of a couple of state of the art robotic devices currently used for robotic surgeries. Our models are production ready and can be integrated into any MLOps related workflow. Our ambition is to keep striving for achieving highly accurate as well as computationally efficient models. We are currently disseminating our work and results through scholastic literature.

The poster concludes by envisioning the future of AI in HCI for CAL. As AI systems continue to evolve, they have the potential to offer personalized surgical solutions based on patient-specific data, thereby tailoring treatments for optimal outcomes. Additionally, collaborative robotic systems, driven by AI, are poised to enhance the surgeon's capabilities. In summary, the role of AI in human-computer interaction in CAL is multifaceted and transformative. AI-driven image analysis and recognition empower surgeons with real-time insights, AI-based training tools expedite skill development, and AI-driven monitoring enhances patient safety and experience. Ethical considerations are crucial in AI integration, and the future promises even more personalized and collaborative approaches to laparoscopic surgery. This poster sheds light on the evolving landscape of AI in HCI within the realm of computer-aided laparoscopy, paving the way for safer, more precise, and patient-centered surgical interventions.

Managing Organizational Factors in the Era of Hybrid Work: Unveiling the Invisible Work.

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Abstract:

My doctoral research focuses on how the implementation of hybrid work models impact workers in the IT sector in the wake of the pandemic. Work models such as hybrid work, emerged as a result of a combination of factors, including changes in technology, shifting attitudes towards work-life balance, and the COVID-19 pandemic. Both organizations and individual workers played a role in championing these models (Quam, 2010). Technological advances, such as remote communication and collaboration tools (Olson et al., 2014) played a significant role in enabling them (Aroles et al., 2021). Moreover, O'Neill (2022) shows that post-COVID-19 pandemic, many managers and their employees preferred a hybrid work model with the option of selecting specific days to go to the office, rather than fully working remotely, to use the office space to amplify cooperation and team working, and hybrid work is hoped to improve personal and organisational performance (Katsenos & Pierrakeas, 2022), although the reality may be more complex as it is suggested, for example, by earlier literature on flexible work (Gray et al., 2021).

Research on remote work during the pandemic has been conducted (Tang et al., 2022), yet research on how hybrid work post-pandemic is still limited, but growing (Hoggan et al.; Mark et al., 2022; Smite et al., 2023). Due to these and many other challenges, a need to study more detailed practices of hybrid work is crucial, indicating the need for my PhD study, which will connect several aspects of Computer-Supported Cooperative Work (CSCW), Human-Computer Interaction (HCI) as well as Information Systems (IS)

In particular, I focus on the organisational factors shaping the way in which hybrid workers work. A complex interaction of organizational dynamics has been introduced into the workplace as a result of the introduction of hybrid work arrangements, which combine in-person and remote work. Such organisational dynamics shape the way in which hybrid work is structured and done, and also the practices of the workers themselves. The concept of "invisible work" is an important one in relation to organizational variables that affect hybrid work.

The concept of "invisible work" represents the often unacknowledged or overlooked tasks and efforts that are integral to interactive processes but remain hidden or unrecorded by traditional work systems. (Hatton, 2017). This concept will guide a focused investigation of the important (and possibly overlooked) tasks that are necessary in doing hybrid work within an organization.

In the context of organizational factors, invisible work includes policy development and alignment, leadership and culture fostering, technology integration and infrastructure management, and the ongoing measurement and adaptation of hybrid work models. (Roy, 2022). These tasks, though often hidden from view, play a crucial role in shaping the effectiveness of an organization's approach to hybrid work. Key themes and topics to be explored in the poster include: 1.) Policy Development and Alignment 2.) Leadership and Culture 3.) Technology Integration and Infrastructure Management 4.) Measuring and Adapting

Exploring older adults lived experiences of digital exclusion: A case study from a Citizen Think In in Ireland.



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Abstract:

Although the number of older people who are digitally connected continues to rise, there are still millions of people over the age of 55 who are digitally excluded. Factors such as income and education play a part, however, age is still the biggest indicator of who is digitally excluded. Many older adults face problems in performing basic tasks such as accessing government services or banking. Another challenge is social exclusion faced by elderly because they cannot connect with peers through networks due to lack of digital skills.

To address concerns about digital exclusion in everyday life for older adults and to capture their lived experiences, a group of researchers from Technological University Dublin, Trinity College Dublin and Dublin City University organized a Citizen Think In (an interactive public discussion) to engage a community of 60 older adults to allow them to share their insights.

The participants were divided into five groups each discussing specific scenarios focusing on opportunities, impacts, risks and benefits of technology use. The scenarios related to topics including online banking, home support technologies and social platforms. Through the discussion, participants acknowledged the important role technology plays in their lives but urged innovators to ensure that their tech innovations are inclusive and have tutorials that are easy to access, particularly for the older population and people with disabilities. They also expressed a need for continued personalised learning and technical support to help them to develop and maintain digital skills. This poster will present an overview of our methodology in organizing a Citizen Think In, co-creating scenarios about digital exclusion with older adults and outline our findings from the session.

Breaking Accessibility Barriers: Reimagining Conventional Health Data Representation for Older Adults.



Peterson Jean, TU Dublin.

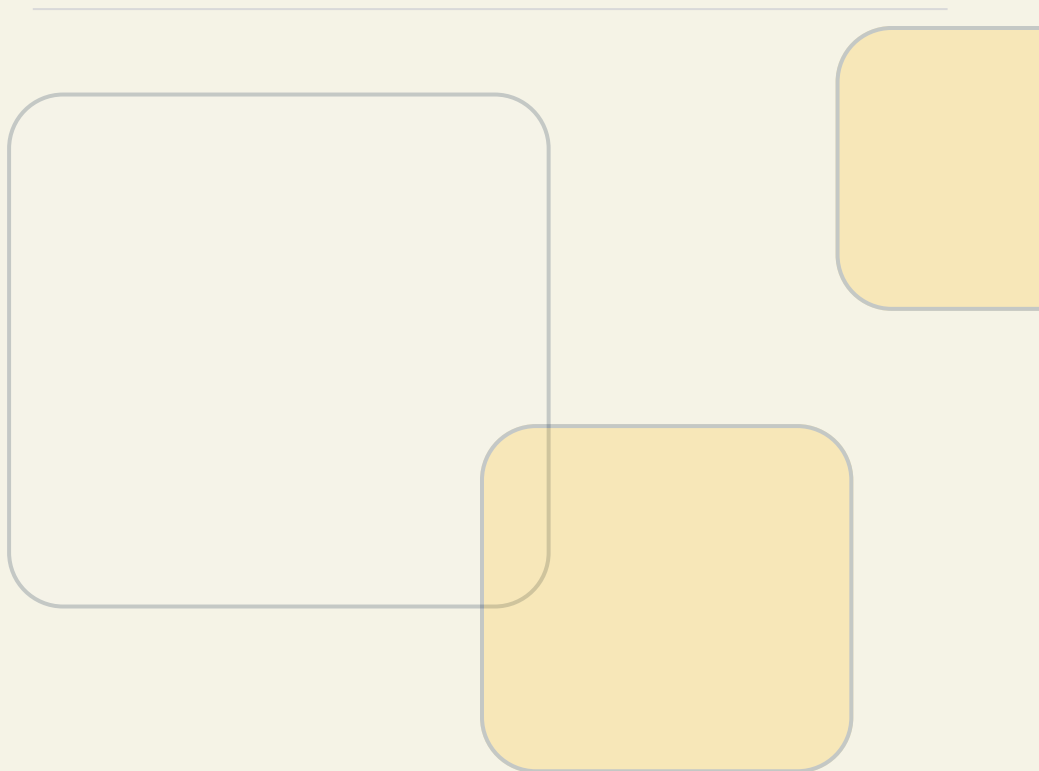
<https://github.com/petersonjean>

Abstract:

The prevalence of off-shelf wearable devices increases the monitoring and measurement of critical physiological parameters like activity, sleep, heart rate, and blood pressure over time through health applications. The related analysis feedback is often presented through conventional graphical representation directly to the end-users. Health data representations are often ad hoc, rooted in long clinical conventions, and need more standardisation for non-expert user-centric design. This ad-hoc nature results in a notable disparity between the complexities of clinical-oriented representations and the diverse needs of older adults who rely on them for managing their health. It often presents a significant challenge for older adults due to age-related cognitive, physical and sensory changes. While extensive research has been conducted on improving health literacy and digital literacy for older adults, there remains a critical gap in addressing the specific accessibility barriers associated with the actual health data representations.

Furthermore, this gap widens for older adults as they inevitably face age-related impairments, affecting their self-efficacy, cognitive abilities, and sensory perceptions, thus reinforcing the "cycle of injustice" in technology utilisation. These challenges extend beyond health and digital literacy, influencing their ability to process and understand such complex and nuanced health data and the critical response action taken. Beyond these existing conventional graphic representations, there are potential opportunities to widen health data representations to incorporate other modalities, such as sound (speech and non-speech) and haptics(touch), to complement or reinforce visual cues. Harnessing the multisensory capacities of users may provide a more comprehensive and accessible approach to the design of health data representations.

Therefore, this research aims to identify the barriers associated with current data feedback cues and design requirements for a novel, multimodal health data representation system tailored to the needs and preferences of older adults. By evaluating prototypes iteratively with experts and older adult end-users, we seek to determine the most appropriate modality cues. These cues will harness end-users multisensory capacities to empower them to engage actively with their health data. Such novel end-user feedback as an emerging and innovative research area will establish an ecology of multimodal cues portable to any sensor technologies. Designing such context-aware prototypes with multimodal feedback cues may shift the power dynamics away from experts and towards older adult users. It will foster a more equitable and beneficial utilisation of digital health technologies through inclusive and accessible health data representations.



Co-design of an interactive outdoor interface with older adults to promote physical activity and rehabilitation.

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Abstract:

Authors: Fatima Badmos, Emma Murphy, Damon Berry

Key words: older adults, co-design, outdoor activity, technology

Engaging in outdoor activity is a socially valued and anticipated behaviour that is frequently endorsed in physical activity and rehabilitation programmes. Public health authorities, such as the World Health Organisation (WHO) advocate for this practice. Furthermore, research and physical activity guidelines prescribe outdoor activities as a means to prevent adverse health outcomes and promote the recovery of mental and physical well-being in older adults. Prescribed outdoor physical exercise has been shown to promote social interaction and improve quality of life. While much research exists on different technologies to promote physical activities outdoors among older adults, little research explores how physical web technology can promote outdoor physical activities and rehabilitation among this demographic.

We propose that an innovative approach that leverages web technology to craft an interactive wellness park will promote outdoor physical engagement among older adults. Physical Web is an approach, that allows mobile device users to use web technologies to navigate and interact with nearby physical objects or to consume web services on mobile devices that depend in some way on nearby physical objects. This approach enables barrier-free measurement and management of physical activities and allows minimum technology commitment from end-users, by enabling easy access to personalised physical activity resources, rehabilitation guidance, and social interaction. Physical web technology has the potential to enhance quality of life for older adults.

This research will adopt a co-design approach prioritising collaboration supported by design thinking tools and techniques. The user interface will be co-designed by older adults, physiotherapists and activity coordinators informed by behaviour change theory to create a personalised and accessible outdoor digital rehabilitation intervention. To initiate the development process of this application, we organised four focus group workshops with older adults. Older adults from different older adult clubs in Ireland were recruited to take part in this study. The primary objective of the workshops was to investigate the obstacles and motivators influencing the participation of older adults in outdoor physical activities. The purpose was to gain insights that would inform the ideation and prototyping stage of the design process and to help in the development of technology solutions that are both appealing to and effective for this demographic. This approach aligns with the current trend of adopting a comprehensive perspective in designing for older adults.

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Thank You

Thank you everyone who presented their research for iHCI 2023 at Dundalk Institute of Technology and for contributing to the discussions. It was great to see so much vibrant activity in the Irish HCI community. We hope to reconnect soon at a future edition of the iHCI symposium!

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