Playful, Curious, Creative, Equitable: Exploring Opportunities for AI Technologies with Older Adults

Ewan Soubutts[1], Aneesha Singh[1], Bran Knowles[2], Amid Ayobi[1], Nervo Verdezeto Dias[3], Britta Schulte, Julia McDowell[2], Caroline Swarbrick[2], Andrew Steptoe[1], Jasmine Fledderjohann[2], Helen Petrie[4], Richard Harper[2], Yvonne Rogers[1]

[1] UCL Interaction Centre, University College London, 66-72 Gower Street, London, WC1E 6EA
[2] University of Lancaster, Bailrigg, Lancaster, LA1 4YW
[3]School of Computer Science and Informatics, Cardiff University, Senghennydd Road, Cardiff, CF24 4AG
[4] University of York, York YO10 5GH, United Kingdom
[5] Bauhaus Universitat Weimar, Geschwister-Scholl-Straße 8/15, 99423 Weimar, Germany

Abstract. There has recently been much discussion around OpenAI, Generative AI, use of chatbots and the use of other immersive technologies in the mainstream. These developments have much to offer to older adults in terms of playful, accessible and creative ways to engage with technology in everyday life. In this workshop, we are interested in developing a research agenda for HCI research with older adults to explore, enjoy, build new and extend existing interactions with such technologies. What are the possibilities they offer simply for introducing creativity, playfulness, enjoyment and 'fun' for older adults in everyday life? Or are there other goals that older adults want to achieve using them, such as new ways of socially engaging with their grandchildren, developing hobbies and knowledge, or simply making their lives easier? Can these tools empower older adults to explore various interaction modalities to help them achieve their goals? Finally, what are the new ways that these tools can be used to engage with older adults in the research and design of new emerging technologies? In this workshop, we will aim to generate discussion, develop a community and a roadmap for older adults' use of technology that is playful, curious, creative and equitable. We will focus on five themes for the role of such technologies: (i) for enabling expression and creativity, (ii) as a catalyst for experience and action, (iii) for enabling reflection and awareness, (iv) for communication and (v) supporting the design process for (re) inventing new products and avenues for use. This workshop will feature co-creation and exploration of research methods and technologies, with panel and multidisciplinary discussions bringing together researchers who are interested in designing for and with older adults. We will explore new technology interactions including AI and immersive technologies within HCI; discussing methods, opportunities, and challenges in using these technologies and leveraging them for ideation, and form a multidisciplinary community for future synergies and collaborations.

1   Introduction

Artificial intelligence (AI) enabled technologies are being used to enable creative approaches in many different ways. Some notable examples recently have been AI generated art and music to create unique compositions; video creation by stitching together pre-existing footage or generating entirely new footage, writing poems and prose, answering questions and expanding knowledge on areas of interest. AI-enabled chatbots and voice interfaces provide interaction and fun in staying connected and also making it easier and more natural to engage with technology. There has been much discussion around the use of these technologies but most of the discourse has focused on younger people.

 To re-contextualise this, our workshop particularly focusses on older adults, posing a range of questions, including: How do older adults perceive and experience AI-based technologies? How can these technologies empower older people and what are the possibilities and concerns? Can these technologies offer a playful and engaging way for older adults to stay connected and active? What roles can they play - as companions, mediators or just fun tools to allow people to engage with technology in new creative ways? Can these technologies also potentially help to engage older adults with the design and research process by supporting the generation of new and innovative ideas, and bring those ideas to life in ways that might not have been possible otherwise?

This workshop seeks to develop a 'roadmap' for researchers and practitioners within HCI and adjacent fields to explore technologies that are playful, creative and equitable in collaboration with older adults and discover what role they may play in everyday contexts. Whilst HCI has an extensive body of work investigating the ways in which technology can be designed creatively for older adults [3,4,11], there has been less of a focus on the ways in which older adults think or act creatively, much less the tools they use for creative ideation [1,9]. Most of these endeavors have either focused on medical interventions [7,8], the home [6,12], or speculative but focused activities towards the design of a specific technology [2,5,10].

These efforts towards understanding creative practice through the lens of aging, have largely been tailored around specific empirical outcomes. What is needed, is a deeper conversation around how to enable and draw out individualised and unique creativity, stemming from older adults' diverse life experiences. There is potential, stemming from this, to build models based on playful approaches and leveraging older adults' creativity that can in turn, enable HCI researchers and practitioners' future investigations, allowing older adults greater creative freedom within technology studies, without the need to turn to conventional approaches to draw out people's creativity.

2   Workshop Objectives

This workshop has an open-ended exploratory tone and the starting point of our discussions include the following themes:

Experience: A detailed understanding of the AI needs of older adults is crucial to inform the design of agency and creativity supportive AI technologies.
- How do older adults perceive and experience different types of AI technologies, from voice-based user interfaces to generative AI design tools?
- What are the possibilities offered by new AI technologies for supporting creativity, playfulness, enjoyment and 'fun' for older adults in everyday life?
- What other roles can AI play in the lives of older adults?

Methods: We will reimagine how we can adopt and adapt human-centered methodologies to engage with older adults within the AI context:
- How can researchers and older adults be supported in collaboratively informing the design of AI technology?
- What methods and theories are particularly suitable to understand and support the AI needs of older adults?
- What key principles can be applied to support the agency and creativity of older adults throughout human-centered AI design processes?
- What are the new ways that these tools can be used to engage with older adults in the research and design of new technologies?
- Are these playful ways of creating content rich mediations (using AI-generation tools, for example) enjoyable for older adults?

Design: We will explore how technologies can be designed to support the AI needs of older adults:
- How can AI tools be designed to empower older adults to leverage different interaction modalities in daily life?
- How can AI chatbots be designed to support how older adults intertwine digital and non-digital worlds?
- How can AI systems be designed to support older adults to creatively self-manage their lifestyles during a cost of living crisis?

3   Expected Outcomes

This workshop will produce discussions, understandings and methodological tools for identifying and conducting research with older adults using emerging AI technologies and services, such as OpenAI. The aim of this will be to enable research into older adults' creative practices, their sources of inspiration and personal creativity and to derive methodologically rich insights for researchers conducting research with older adults in the future e.g. through co-design or participatory design workshops and interview studies.

4   Workshop Outline

The workshop will begin with introductions from the group and an outline of the workshop goals for the day by the organisers. Following this, we will lhave a round of 3 minute presentations for 15 mins by attendees before kicking off in full. These will be introductions to existing research or novel provocations around older adults and AI within HCI. Interactive presentations by expert speakers for the workshop will follow this. Following this will be a facilitated panel discussion where presenters from the earlier presentations will be invited to present ideas around AI as a tool for older adults' creativity and as a way of scoping their needs. Participants will then break into groups to discuss the themes in the above sections Lastly, we will wrap up the workshop summarising the day's discussion and outlining future directions and challenges. We will also outline the creation of future plans and actions including creation of an opt-in mailing list from the workshop attendees and organising future collaborations and discussions.

5   Target Audience

The target audience for this workshop include researchers and practitioners working with older adults, those doing design research (e.g. co-design and research through design) and those working with OpenAI and other AI related, immersive and playful tools and technologies. We are also interested in perspectives from people working in the social sciences, psychology, health and environment spaces. We also encourage early-career researchers and PhD students to submit either existing relevant work or works in progress here too.

6   Organising Committee

Ewan Soubutts is a Research Associate in Human Computer Interaction for health and care at University College London. His research is interested in older adults and the study of health and wellbeing, in particular within the home. Ewan has published to venues such as ACM CHI and CSCW on topics such as emotional acceptance, social facilitation of smart home technologies and labour in shared care spaces.

Aneesha Singh is an Associate Professor in Human Computer Interaction at University College London. She is interested in the design, adoption and use of personal health and wellbeing technologies in everyday contexts. She has a broader interest in questions of identity and inclusion and how they (should) shape the technologies we use. Her research areas include digital health and wellbeing, ubiquitous computing, multisensory feedback and a focus on marginalised populations.

Bran Knowles is a Senior Lecturer in the School of Computing and Communications at Lancaster University. Her research explores the social impacts of computing, with a

particular interest in trust, privacy, and ethics, including work exploring these issues at both ends of the age spectrum. Bran currently leads the EPSRC funded DigiAge project, and serves as a member of the ACM Europe Technology Policy Committee.

Amid Ayobi is a Lecturer in Digital Health at University College London. His work has included multidisciplinary projects aimed at supporting self-tracking in multiple sclerosis care, understanding the mental health needs of people from ethnic minority backgrounds, and developing machine learning models with clinicians, data scientists, and people with diabetes. His overarching research aims is to inform the design of agency and creativity supportive health and wellbeing technologies.

Britta F. Schulte is a postdoc at Bauhaus University Weimar. Their work explores our relationships towards technologies for elderly care and the ageing body, with a strong focus on intimacy and sexuality. In their works they often use speculative and creative approaches such as storytelling and design fictions in many forms.

Julia McDowell (PhD) brings over twenty years' experience as a researcher-practitioner in the fields of technology-enhanced learning, web programming and digital humanities more widely. Her current interests are centred around exploring the cross-cutting and interdisciplinary themes emerging from the EPSRC-funded 'Equity for the Older: Beyond Digital Access' project, undertaking the day-to-day research to help improve understanding of structural contributors to older adult marginalisation in the digital economy, and to develop insights into mitigation of these contributors.

Jasmine Fledderjohann is a Senior Lecturer in Sociology at Lancaster University. She holds a dual-title PhD in Sociology and Demography from the Pennsylvania State University and was a postdoctoral fellow in Sociology at the University of Oxford before joining Lancaster in 2016. Since 2020, she leads the Food Security for Equitable Futures project, a UKRI funded Future Leaders Fellowship on the consequences and measurement of food insecurity in Global Majority countries. She is a mixed methods researcher. Broadly speaking, her substantive interest is in social inequities, including social justice in the design and application of digital technology, the social causes and consequences of food insecurity, and reproductive justice. *Caroline Swarbrick* is Director of Education and Senior Lecturer in Ageing in the Division of Health Research at Lancaster University and Senior Qualitative Methods Lead for the Research Design Service (Lancashire and South Cumbria). Her research utilises a socio-ecological perspective of dementia, developing participatory approaches through a range of qualitative creative and sensory methods, including film, animation and music-making. Her research involves working collaboratively with people living with dementia and care partners as co-researchers having co-designed the CO-researcher Involvement and Engagement in Dementia (COINED) model.

Nervo Verdezoto Dias is a Senior Lecturer in Human-Computer Interaction and Digital Health and Lead of the Human-Centred Computer Research Unit at Cardiff University. He has expertise in ethnographically informed design, user-centred and participatory design, and design and evaluation of sociotechnical systems. His previous work has investigated how older adults and pregnant women use self-care technologies in everyday life and how these shape their everyday practices, clinical encounters and decision making. His recent work investigates socio-technnical healthcare

infrastructures in the Global South (India, Ecuador, Peru, Ghana, South Africa, etc.). Research funded by GCR, MRC, AHRC, EPSRC, Newton Fund, GW4.

Helen Petrie is Professor Emerita of Human Computer Interaction at the University of York. She is a Chartered Psychologist and Associate Fellow of the British Psychological Society and has degrees in both psychology and computer science Her research interests are mainly focused on the design and evaluation of technologies to improve the quality of life of people with disabilities and older people. She has been involved in over 30 British and international projects in this area, has published widely and provided consultancy to government and industry on accessibility and usability of new technologies She has received numerous awards for her work including a Social Impact Award from the ACM (2009), a Lifetime Achievement Award from the Royal National Institute for Blind People (2017) and a Fellowship from IFIP (2021).

Richard Harper Is Professor of Computer Science and Director of the Institute for Social Futures at Lancaster University. He is a Fellow of the IET, Fellow of the SIG-CHI Academy of the ACM, Fellow of the Royal Society of Arts, and Visiting Professor in the College of Science at the University of Swansea, Wales. His research is primarily in Human Computer Interaction, though it also includes social and philosophical perspectives. His research on trust in HCI has ranged from explorations of file abstractions, the role of trust in the self, and how trust is a taken for granted feature of interaction. He has written 13 books, including 'Trust, Computing and Society' (Ed. CUP, 2015) the IEEE award winning 'Myth of the Paperless Office' (MIT: 2003)); and 'Choice' (Polity: 2016). He holds 26 patents, including ones for new cloud-based interaction devices (such as the 'Cloud Mouse'), new secure data stores and lightweight mobile phone data exchange protocols. Prior to joining Lancaster he was Principal Researcher at Microsoft Research.

Yvonne Rogers is a Professor of Interaction Design, the director of UCLIC and a deputy head of the Computer Science department at University College London. Her research interests are in the areas of interaction design, human-computer interaction and ubiquitous computing. A central theme of her work is concerned with designing interactive technologies that augment humans. She is particularly interested in how humane applications of AI and smart technologies can be developed that benefit and disrupt society. She was awarded the ACM SIGCHI Lifetime Achievement Research Award in 2022, "presented to individuals for outstanding contributions to the study of human-computer interaction." In the same year, she was elected as a fellow of the Royal Society as "one of the leaders who created the field of Ubiquitous Computing".

References

[1]   Phil Adams, Elizabeth L. Murnane, Michael Elfenbein, Elaine Wethington, and Geri Gay. 2017. Supporting the self-management of chronic pain conditions with tailored momentary self-assessments. *Conf. Hum. Factors Comput. Syst. - Proc.* 2017-May, (2017), 1065–1077. DOI:https://doi.org/10.1145/3025453.3025832

[2]   Audrey Desjardins, Jeremy E Viny, Cayla Key, and Nouela Johnston. 2019. Alternative Avenues for IoT : Designing with Non-Stereotypical Homes. *Proc. 2019 CHI Conf.*

Hum. Factors Comput. Syst. (2019), 1–13. Retrieved from https://doi.org/10.1145/3290605.3300581

[3] Elisa Giaccardi, S.C Kuijer, and Louis Neven. 2016. Design for Resourceful Ageing : Intervening in the Ethics of Gerontechnology. *Proc. DRS 2016, Des. + Res. + Soc. Futur. Think.* June (2016).

[4] Christina N. Harrington, Lauren Wilcox, Kay Connelly, Wendy Rogers, and Jon Sanford. 2018. Designing health and fitness apps with older adults: Examining the value of experience-based co-design. *ACM Int. Conf. Proceeding Ser.* (2018), 15–24. DOI:https://doi.org/10.1145/3240925.3240929

[5] Tom Jenkins, Anna Vallgårda, Laurens Boer, Sarah Homewood, and Teresa Almeida. 2019. Careful Devices. (2019), 1–5. DOI:https://doi.org/10.1145/3363384.3363474

[6] Bethany Kon, Alex Lam, and Jonathan Chan. 2017. Evolution of Smart Homes for the Elderly. *Proc. 26th Int. Conf. World Wide Web Companion - WWW '17 Companion* (2017), 1095–1101. DOI:https://doi.org/10.1145/3041021.3054928

[7] Reena Lasrado, Therése Bielsten, Mark Hann, Linda Davies, James Schumm, Siobhan Reilly, Caroline Swarbrick, John Keady, and Ingrid Hellström. 2018. Designing and Implementing a Home-Based Couple Management Guide for Couples Where One Partner has Dementia (DemPower): Protocol for a Nonrandomized Feasibility Trial. *JMIR Res. Protoc.* 7, 8 (August 2018), e171. DOI:https://doi.org/10.2196/resprot.9087

[8] Rob Procter, Joe Wherton, and Trisha Greenhalgh. 2018. Hidden Work and the Challenges of Scalability and Sustainability in Ambulatory Assisted Living. *ACM Trans. Comput. Interact.* 25, 2 (2018), 1–26. DOI:https://doi.org/10.1145/3185591

[9] Antti Salovaara, Andrea Bellucci, Andrea Vianello, and Giulio Jacucci. 2021. Programmable smart home toolkits should beter address households' social needs. *Conf. Hum. Factors Comput. Syst. - Proc.* (2021). DOI:https://doi.org/10.1145/3411764.3445770

[10] Britta Friederike Schulte and Eva Hornecker. 2022. Care Stories: Understanding People's Hopes and Fears for Technologies of Care through Story Elicitation. (2022), 117–128. DOI:https://doi.org/10.1145/3569219.3569309

[11] Yolande Strengers, Melisa Duque, Michael Mortimer, Sarah Pink, Rex Martin, Larissa Nicholls, Ben Horan, Alicia Eugene, and Sue Thomson. 2022. "Isn't this Marvelous" Supporting Older Adults' Wellbeing with Smart Home Devices Through Curiosity, Play and Experimentation. *DIS 2022 - Proc. 2022 ACM Des. Interact. Syst. Conf. Digit. Wellbeing* (2022), 707–725. DOI:https://doi.org/10.1145/3532106.3533502

[12] Matteo Zallio and Niccolò Casiddu. 2016. Lifelong Housing Design: User Feedback Evaluation of Smart Objects and Accessible Houses for Healthy Ageing. *Proc. 9th ACM Int. Conf. PErvasive Technol. Relat. to Assist. Environ.* 29-June-20, (2016), 70:1--70:8. DOI:https://doi.org/10.1145/2910674.2935828