

Interacting with Assistive Technology (IAT) Workshop

Abstract:

Assistive Technology (AT) is designed to increase, maintain or improve the functioning of people with disabilities [1]. These products include hardware, software or mechanical devices, such as wheelchairs. The purpose of AT is to improve the quality of life for people with a wide range of disabilities. The user community can experience varying levels of abilities and it can be challenging to develop a single AT solution to suit the needs of all users.

There are an estimated 1.3 billion people (16% of the global population) who have a significant disability that affects their daily lives [2] and over 2.6 billion people requiring one or more assistive products [3]. Therefore, the World Health Organization (WHO) has developed the International Classification for Disability, Functioning and Health (ICF) Framework [4], which has become the worldwide standard for measuring health and disability. One of the challenges of AT is awareness, and the WHO identified that 1 in 10 people worldwide do not have access to the required AT products [5]. To address this issue, Whittington et al. [6] developed the EduAbility Android application as a solution to recommend AT based on physical and cognitive abilities, as well as to provide AT training to teachers, support staff, parents and carers. Furthermore, the Global Disability Innovation (GDI) Hub has created the Assistive Technology Insights Portal to provide access to over 800 AT resources across 112 countries [7]. This challenge has also been highlighted by Policy Connect, who operates the All-Party Parliamentary Group for Assistive Technology in the United Kingdom (UK), where Whittington and Dogan (Organizing Committee members) are academic representatives.

The complexities of disability can result in individuals requiring more advanced interaction mediums, such as Sip and Puff technologies, instead of touch-based interactions. It is important that a variety of AT products are available to prevent marginalization and promote an inclusive society. AT can be designed to be customisable to improve accessibility (e.g. by enabling users to adjust display preferences on screen for visibility). A growing number of AI-enabled ATs employ machine learning to sense and interpret contextual information for users with disabilities, such as object recognition for visually impaired users [8] and sound sensing tools for those with hearing impairments [9]. Adaptive AT can provide real-time personalization by automatically monitoring a user's current abilities and status [10]. Recently, advances in large language models have enabled generative AI to assist people with and without disabilities in daily living, e.g., AI-augmented communication [11], AI-assisted writing for people with dyslexia [12] and AI-based remote learning [13]. However, such AI-enabled systems may have a negative impact. For example, AI-assisted communication may increase partner uncertainty and reduce relationship satisfaction [11]. While increased data collection enhances system performance and enables personalization tailoring services to individual needs, it often requires access to and analysis of personal data and thus raises privacy concerns, which is particularly significant, as AT may handle sensitive personal health information. Further, transparency of automated systems is related to users' trust and continued use [14]. Therefore, it is necessary to consider trade-offs carefully to balance usability with various concerns in the design of such systems.

We have organized several previous workshops, including the previous Interacting with Assistive Technology (IA Tech) Workshop at the Interact 2023 Conference, the Diversity, Accessibility and Inclusivity (DAI) Workshops at BCS HCI 2021 and 2022 conferences and the Human Centered Design for Intelligent Environments (HCD4IE) Workshop at British HCI 2016 and 2018 conferences. During all the workshops, themes were explored in relation to increasing awareness of AT and the best practices that should be implemented to ensure that people with disabilities have equal opportunities to benefit from assistive technology. Bournemouth University (UK) also hosted two Assistive Technology Symposiums in 2018 and 2019, as well as the BU-Dundee AT Summit in September 2023, in collaboration with the University of Dundee and Policy Connect.

The IAT Workshop will aim to continue researching the themes through contributions associated with the development of AT solutions to improve daily living. It will also discuss the lessons learnt and approaches that can be applied to increase knowledge of AT, both for the end users and individuals

providing support for people with disabilities. Further, it will facilitate discussions around potential issues in AI-enabled ATs to improve users' acceptance and experience, as well as to minimise negative impact that may result from its deployment and use.

List of Topics:

The IAT Workshop will explore the utilization of AT to improve quality of life and ensure that products are available and inclusive for all abilities. The topics of interest focus on the following seven themes related to AT:

- **Accessibility** (Accessible Authentication, Accessible Design, Usable Accessibility, User Experience, Visual Design, Web Accessibility)
- **AI-Enabled AT and Issues** (AI-Assisted Learning/Communication, Fairness, Trust, Privacy)
- **Diversity** (Technology Acceptance, Technology Adoption, Technology Discrimination)
- **Human Centered Design Approaches** (Design Solutions and Evaluations, Heuristics, Multimodal Interactions, Participatory Design)
- **Inclusivity** (Affordability, Availability, Design for All, Inclusive by Design, Universal Design)
- **Application Areas** (Aging Population, Ambient Assisted Living, Mobility, Smart Systems, Telecare, Telehealth)
- **Industrial Case Studies** (Education and Training Programmes, Healthcare)

Goals:

The intended audience for this workshop will be academics and industries involved in the development of AT. This includes software developers, user experience researchers, healthcare professionals, social scientists, psychologists, and policy makers who contribute to the development of such interactive AT solutions. The workshop will cover the following key aspects:

Insights from Research Studies: Delving into cutting-edge AT research to understand the current state-of-the-art.

Practical Applications and Training Resources: Examining lessons learned from recent practical applications and training resources. This includes exploring projects, evaluating various AT tools and devices, organizing them based on their effectiveness for specific needs and situations, and assessing their social acceptability.

AI-Supported AT: Investigating the impact of AI-supported Assistive Technologies. This involves exploring the latest tools that leverage AI to enhance visual tracking skills, support students with social disabilities, improve time-management skills, and more. The discussion will also encompass defining limitations and delimitations of these technologies.

Organizing Committee:

Dr Paul Whittington, Bournemouth University (UK), whittingtonp@bournemouth.ac.uk

Prof Huseyin Dogan, Bournemouth University (UK), hdogan@bournemouth.ac.uk

Dr Ruijie Wang, Bournemouth University (UK), rwang3@bournemouth.ac.uk

Dr Chris Porter, University of Malta (Malta), chris.porter@um.edu.mt

Prof Annalu Waller, University of Dundee (UK), a.waller@dundee.ac.uk

Dr Dena Al-Thani, Hamad Bin Khalifa University (Qatar), dalthani@hbku.edu.qa

Dr Sezin Eşfer Öndüncü, Bahçeşehir University (Turkey), sezin.esferondunc@bau.edu.tr

Advisory Committee:

Prof Nan Jiang, Bournemouth University (UK), njiang@bournemouth.ac.uk
Prof Jane Seale, The Open University (UK), jane.seale@open.ac.uk
Prof Kerem Rızvanoğlu, Galatasaray University (Turkey), krizvanoglu@gsu.edu.tr
Prof Raian Ali, Hamad Bin Khalifa University (Qatar), raali2@hbku.edu.qa
Stephen Giff, Google (US), sgiff@google.com

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