Diversity, Accessibility and Inclusivity are important considerations for cyber security, to ensure that security mechanisms are suitable for all users, who could have differing abilities as a result of physical or cognitive impairments. One way this can be achieved is by implementing accessible authentication, which is recommended as part of the Web Content Accessibility Guidelines (WCAG 2.1) defined by the World Wide Web Consortium (W3C). There have been recent examples where authentication has presented challenges for people with disabilities (BBC News, 2020). Other considerations include, deriving heuristics during the design of systems, to ensure that the accessibility requirements of potential users are satisfied. This Workshop will investigate the recent developments that aim to ensure cyber security is accessible and inclusive to all users. It will discuss the methods that can be implemented to develop such systems. It will also become a forum for researchers in the domains of accessibility, cyber security, human computer interaction, human centred design and System of Systems. Discussions during the Workshop will lead to the creation of a road map to enhance the diversity, accessibility and inclusivity of cyber security.

1. MOTIVATION

Identifying and specifying system security needs for users is difficult (Cheng and Atlee, 2009), but designing for a specific audience does not promote inclusivity for the wider audience. Mainstream research in security and privacy tends to focus on technical mechanisms and usability (Wang et al., 2018), but does not account for specific needs promoting accessibility. Worldwide there are 500 million people with disabilities, accounting for 15% of the total population (World Bank, 2021). Disability can be classified using the World Health Organization (2001) International Classification for Disability, Functioning and Health Framework (ICF). Kostanjsek (2011) states that disabilities should not characterise individuals, but be seen as “a complex interaction between the person and their environment”. It is important to consider accessibility and inclusion to ensure that this user community has equal access to opportunities. This can be achieved through the use of assistive technologies that can “increase, maintain or improve the functional capabilities of persons with disabilities” (Assistive Technology Industry Association, 2021). Dr Whittington (Organising Committee) is an academic representative for the Smart Homes and Independent Living Commission that provides recommendations to support the adoption of smart home technology in social care.

It has been identified that people with disabilities can encounter barriers due to web security and privacy technologies, for example, users with learning disabilities experiencing challenges when following multi-step procedures on websites (World Wide Web Consortium, 2020) and individuals with physical disabilities being unable to authenticate themselves using one time codes over the telephone. This results in poor accessibility and potentially being excluded from purchasing goods, accessing services or communicating with
organisations that result in frustration and cancelling of transactions. Accessible authentication mechanisms are recommended by the World Wide Web Consortium (2021) to promote inclusivity of computing to all abilities.

Due to COVID-19, financial services have been hardest hit by cyber security; therefore Financial Technology (FinTech) is the exemplar case study for this Workshop. Global smartphone penetration increased from 33.5% in 2016 to 46.45 % in 2020 (Statista, 2021). The ubiquitous nature of this device has provided the rails for inclusive services leveraging the smartphone. The financial services sector has benefitted from this penetration, where FinTech is being leveraged as a tool to provide financial services to over 1.7 billion people globally (Asli et al., 2018). Incumbents in the Financial Services sector have promoted FinTech through Mobile Financial Services to provide innovative products, reach new customer bases and reduce operational costs, while challenger banks are beginning to emerge. Whilst the advent of FinTech has brought financial services closer to a broader range of customers more than ever before, it has introduced the risks of cybercrime to these customers (Shetty, 2018, Stone et al., 2017). Strong technology countermeasures exist, but have not succeeded in minimising the threat, due to human factor concerns (West et al., 2009). To address this problem, there is a need to ensure security controls are usable to end-users and security Application Programming Interfaces are usable to developers and that these controls have considerations for various groups of users, accessibility needs and cognitive limitations.

This Workshop will examine various human factor approaches for making security controls in FinTech inclusive, to improve trust and consequently adoption. It follows the organisation of workshops on Human Centred Design for Intelligent Environments (HCD4IE) at British HCI 2016 (Bournemouth University, 2016) and 2018 (WikiCFP, 2021). Bournemouth University have also held two Assistive Technology Symposiums in 2018 and 2019 (BU Research Blog, 2018; 2019).

2. TOPICS

This Workshop aims to explore the application of solutions to promote diversity, inclusivity and accessibility for cyber security systems, to ensure they are suitable for all abilities. It will culminate a range of topics, focused on three themes:

- **Diversity**
  - Technology Acceptance
  - Technology Adoption
  - Technology Discrimination
- **Inclusivity**
  - Design for All
  - Inclusive by Design
  - Universal Design
- **Accessibility**
  - Accessible Authentication
  - Accessible Design
  - Assistive Technology
  - Usable Accessibility
  - User Experience
  - Visual Accessibility
  - Web Accessibility
- **Human Centred Design Approaches**
  - Design solutions and evaluations
  - Heuristics
  - Multimodal interactions
  - Participatory design
  - Privacy and security studies
- **Application Areas**
  - Aging Population
  - Ambient Assisted Living
  - Mobility
  - Smart Systems (homes, cities etc.)
  - Telecare and Telehealth
- **Industrial Case Studies**
  - Education
  - Financial Technology
  - Health

3. WORKSHOP FORMAT

The Workshop will be a full day event with a Call for Papers. The schedule will be as follows:

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>09:30 – 10:30</td>
<td>Keynote Speaker 1</td>
</tr>
<tr>
<td>10:30 – 10:45</td>
<td>Break</td>
</tr>
<tr>
<td>10:45 – 11:45</td>
<td>Keynote Speaker 2</td>
</tr>
<tr>
<td>11:45 – 12:30</td>
<td>Paper Presentations (Part 1)</td>
</tr>
<tr>
<td>12:30 – 13:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>13:30 – 15:10</td>
<td>Paper Presentations (Part 2)</td>
</tr>
<tr>
<td>15:10 – 15:30</td>
<td>Break</td>
</tr>
<tr>
<td>15:30 – 16:30</td>
<td>Panel Discussion</td>
</tr>
</tbody>
</table>
Keynote Speakers

Dr Dave Edyburn (Senior Research Scientist and Professor Emeritus, University of Wisconsin-Milwaukee) research interests focus on the use of technology to enhance teaching, learning and performance. He has authored over 175 articles and book chapters on the use of technology in special education and his work represents a variety of contributions to theory, research and practice. Professor Edyburn is the editor of the Journal of Research on Technology in Education and Past Chair of the AERA Online Teaching and Learning SIG.

Mr Srin Madipalli is a technology entrepreneur, executive and investor, who was the Founder/CEO of a startup that exited to Airbnb in 2017. Due to his physical disability, he is involved with advocacy work relating to disability inclusion in the workplace, helping technology companies to increase their accessibility and sharing experiences of being an entrepreneur with a disability. Mr Madipalli is on the Boards of leading advocacy groups in the UK and US, including an Advisory Board member at Included VC, which aims to help people from unrepresented groups find roles in the venture capital sector.

4. AUDIENCE

The intended audience for this Workshop will be academic and industries involved in the development of accessible cyber security solutions. Researchers in the domains of Human Computer Interaction, Human Centred Design and System of Systems will also be targeted.

5. PUBLICATION STRATEGY

Accepted Workshop papers will be included in the proceedings of British HCI 2021 and published in the BCS e-WIC repository and the ACM Digital Library. These papers will also be considered as chapters in a future book publication of proceedings.

6. ORGANISING COMMITTEE

Dr Huseyin Dogan is a Principal Academic in Computing at Bournemouth University and Co-Chair of the Human Computer Interaction (HCI) Research Group. His research interests include HCI, Usability Engineering, Ubiquitous Computing, Assistive Technologies, Soft Systems, Systems Design and Systems of Systems. He has been a reviewer for BCS HCI, IEHF, IEEE SMC, IEEE SoSE, IEEE Systems Journal and INCOSE. Dr Dogan was also the general co-chair for the 30th International British Computer Society Human Computer Interaction Conference (British HCI 2016).

Dr Paul Whittington is a Postdoctoral Researcher in Assistive Technology at Bournemouth University. Dr Whittington’s research focuses on Assistive Technologies, Accessible Authentication, Human Factors, Usability Engineering and System of Systems. He was a student volunteer at British HCI 2016. Dr Whittington is an academic representative on the Smart Homes and Independent Living Commission, run by the UK Parliament.

Dr. Edward Apeh is a Principal Academic in Computing at Bournemouth University. He has over 15 years industry experience and has led successful projects in the areas of cyber security, data analytics, data mining and web technologies. He has organised and delivered a number of academic and industry workshops in the areas of data analytics, knowledge management and cyber-security. He has also reviewed papers for various journals and published articles on data analytics, data mining, cognitive computation and neuro-computing.

Dr Duncan Ki-Aries is a Lecturer in Computer Science and Security at Bournemouth University and the Programme Leader for MSc Cyber Security and Human Factors. His previous PhD research focused on Security Risk Assessment in Systems of Systems (SoS), whilst integrating the use of tool-support with CAIRIS. Dr Ki-Aries’ work has been published in leading security and system engineering venues such as Computers & Security, IEEE SoSE and Evolving Security & Privacy Requirements Engineering (ESPRE). He has served as a student volunteer at British HCI 2016, Requirements Engineering (RE) 2017, 2018 and 2019. Dr Ki-Aries is part of the organising committee for the ESPRE Workshop.

7. TECHNICAL COMMITTEE

The Technical Committee will review papers submitted to the Workshop.

- Dr Huseyin Dogan (Principal Academic in Computing, Bournemouth University)
- Dr Paul Whittington (Postdoctoral Researcher in Assistive Technology, Bournemouth University)
- Dr Edward Apeh (Principal Academic in Computing, Bournemouth University)
- Dr Duncan Ki-Aries (Lecturer in Computer Science and Security, Bournemouth University)
- Dr Nan Jiang (Associate Professor in Human Computer Interaction, Bournemouth University)
8. ADVISORY COMMITTEE

The Advisory Committee will guide the selection process for submissions to the Workshop.

- Mr Stephen Ambore (Assistant Director, Central Bank of Nigeria)
- Dr Dave Edyburn (Senior Research Scientist and Professor Emeritus, University of Wisconsin-Milwaukee)
- Mr Stephen Giff (User Experience Manager, Google, Redmond, WA)

7. REFERENCES


