**Popular topics in HCI:**

**Special issue of selected extended papers from the 32nd International BCS Human Computer Interaction Conference**

Raymond Bond, Maurice Mulvenna

School of Computing, Ulster University, Northern Ireland, UK

The 32nd International BCS Human Computer Interaction Conference was held in Belfast, Northern Ireland in July 2018. The conference proceedings included over 230 papers with various topics and applications in Human Computer Interaction (HCI). There were over 60 full papers, more than 90 work-in-progress papers, almost 30 position papers, 17 industry talks (2 submitted papers), around 25 workshop papers, 17 doctoral consortium papers and 4 interactions gallery papers. Pre-conference activities included a doctoral consortium, a masterclass in chatbot design and five workshops.

This introduction presents an analysis of the topics presented at the 2018 conference providing a reflection of the popular themes that exist in HCI as a research discipline. Interestingly, the doctoral consortium papers included topics such as affective computing, tangible user interfaces, information quality, behaviour change interventions in digital healthcare, playful interactions, storytelling, trust, human-data Interaction, reading behaviour, interactive public displays, haptic devices, visualizing personal health data and decision-making. The five workshops included the topics: affective computing; using data to design user interfaces; human-centred design in intelligent environments; digital technology for older people; and digital health. Perhaps as expected, the two application areas include interactive technologies for older people and digital health which is well aligned to the current public need and growing demands.

The conference included five keynotes that focused on research topics related to: the value of human interaction in the building of intelligent systems; designing better digital health tools; designing conversational user interfaces and chatbots; revisiting how we evaluate the user experience of a system; and digital empathy or human-computer empathy. The latter involved a bilateral discussion of how humans could be more empathic to computers and how computers could be more empathic to humans.

The papers presented at the conference fell under a number of themes which reflect topics that are currently popular in the HCI research discipline. These themes are presented in Table 1. Unsurprisingly, the most common theme was ‘design and psychology’. In addition to design, psychology including cognitive and behavioral psychology are core areas of HCI and will likely remain popular as a research topic. Another popular theme was ‘digital health’. The use of interactive systems to support clinical decision making or technologies to help people self-manage their personal health has been a popular topic in research over the last number of years and is therefore likely to remain a key topic at HCI conferences. Another expected theme was ’UX and Usability’, which are themes that are core to the HCI discipline and are likely to always remain a core theme in research akin to design and psychology. Another theme was ‘Societal, Cultural and Social Aspects in HCI’. This was arguably anticipated given the effects of digital technology in society have always been a key area of research in HCI and is likely to remain an important topic due to the emergence of new human-AI interactions which have new socio-cultural implications. These new social challenges might also explain the emergence of the theme in ‘Child Computer Interaction’. Since the democratisation of television and gaming, and more recently the emergence of social media, smart touch screen devices and wearables, there is a market for interactive technologies for children. Hence research in this field is necessary to optimise the UX of these technologies and to also study the positive and negative effects of digital technology on a generation of digital natives. Another very popular but expected theme was ‘Security and Trust’. Security of interactive systems will remain an important topic since a trade-off between usability and security is a key HCI research problem. Also secure access to systems and privacy of personal data is important research in this era of GDPR and other emerging governance and ethical requirements. Moreover, trust between humans and machines is a growing problem given the emergence of new human-AI interactions. Disappointedly, one would have expected the theme of ‘Accessibility’ to have been more popular given accessibility includes topics such as assistive technologies and web accessibility which have traditionally been core topics, however, the community might expect more submissions related to this area in the future.

As the community would expect, there was a theme related to ‘Virtual Environments’. Virtual reality is changing gaming and also skills training in areas such as the military and medicine as well as many other disciplines. There are still many interactive applications to be discovered using VR technologies and there are also technical challenges that need solved. It was also interesting to see a theme related to ‘Eye tracking’ emerge. Eye tracking can be used to either understand the UX and the cognitive effort required to use a system. Eye tracking can also be used to control a system. Eitherway, eye trackers are becoming more cost-effective, which is perhaps why this has emerged as a theme.

It was also interesting to see the emergence of an ‘affective computing’ theme. Modelling emotions is key challenge in artificial intelligence and modelling emotions during user interactions has also become a popular area of research in HCI. However, very few papers at the conference used the term ‘affect’ or ‘affective computing’ in their paper titles. In a similar vein, chatbots was another contemporary theme that emerged. Chatbots have become prevalent through channels such as smart speakers and messaging applications. Chatbots provide a new way to interact with computers since they remove the need for graphical user interfaces and rely on natural language understanding and dialogue. Chatbots require new UX design methods for conversational design as well as new usability evaluation techniques.

Gamification and music were merged as one session due to a lack of core papers in this area. Gamification has been a popular concept in the last decade. The latter related research often includes sonification and other research that can involve using music to enhance the user experience, or to interact with music or for the creation of music. Finally, like most conferences miscellaneous papers fell into more arbitrary themes which were ‘Bespoke HCI Technologies’ and ‘Novel Interaction‘. The former session included topics such as animal computer interaction and new methods to enhance eReaders, whereas the latter included research on new ways to interact, for example with the use of gestures.

A number of highly rated papers from the conference were invited to submit a more detailed paper with new methods and/or results. A total of 9 papers were invited. These papers are presented in this special issue and represent the best studies that were accepted at the conference. These special issue papers are largely varied in their topics. One paper is related to digital health: Enhancing Patient Motivation through Intelligibility in Cardiac Tele-rehabilitation, two papers related to virtual environments: A Virtual Reality Platform for Analyzing Remote Archaeological Sites; and Navigation Comparison between a Real and a Virtual Museum. Another paper is related to honesty: Honesty, Social Presence, and Self-service in Retail; while one paper related to gamification: How Different Personalities Benefit From Gamification. There were two papers involving chatbot research: Understanding and Measuring User Experience in Conversational Interfaces; and Chatbots and Gender Stereotyping. One paper is related to behaviour change: Investigating the Impact of Reinforcement on Implementation Intentions to Support Behaviour Change; and finally, one paper by Boyd et al. is related to measuring usability at different points in time.

This special issue serves as a journal to represent the variety of high quality HCI research that is being carried out today. We trust that you will enjoy reading these papers and take inspiration from their works.

**Table 1. Sessions/themes at 32nd International BCS conference in HCI.**

|  |  |  |
| --- | --- | --- |
| **Theme/Session** | **# papers  in oral session** | **Word frequency (and similar words) in paper titles** |
| **Design and Psychology** | 9 | ~58 papers (paper titles including the words: design [47] and cognitive/cognition [11]) |
| **Digital Health** | 9 | ~18 papers (paper titles including the words: health [14] and medical [4]) |
| **UX and Usability** | 5 | ~22 papers (paper titles including words: usability [6], user experience [5,] UX [1], experience [10 excluding user experience]) |
| **Societal, Cultural and Social Aspects in HCI** | 5 | ~21 papers (paper titles including the words: social [16] and cultural [5]) |
| **Affective Computing** | 4 | ~14 papers (paper titles including the words: emotion [12], happiness [2]) |
| **Chatbots** | 3 | ~10 papers (paper titles including words: chatbot [5] conversational [2], voice Activated virtual assistants [2] and Alexa [1]) |
| **Security and Trust** | 3 | ~10 papers (paper titles including the words: security [4], trust [4] and privacy [2]) |
| **Child Computer Interaction** | 3 | ~9 papers (paper titles including the word: child [9]) |
| **Music and Gamification** | 3 | ~9 papers related to gamification (paper titles including the words: gamification [3], game-based [2], games [2] and exergame [2]) ~2 papers related to music(paper titles including the word: music]) |
| **Eye Tracking** | 4 | ~8 papers (paper titles including the words: eye tracking [7] and eye-gaze [1]) |
| **Accessibility and user modelling** | 3 | ~8 papers (paper titles including the words: accessible [1], disability [1] and impaired [3]) |
| **Virtual Environments** | 3 | ~7 papers (paper titles including the words: virtual reality [4] and Mixed Reality [3]) |
| **Bespoke HCI Technologies** | 5 | NA |
| **Novel Interaction** | 3 | NA |