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Sense, Feel, Design


INTERACT 2021 IFIP TC 13 Workshops
Bari, Italy, August 30 – September 3, 2021
Revised Selected Papers


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Preface

This volume presents a series of revised papers selected from workshops organized by IFIP TC 13 Working Groups (WGs) during the 18th IFIP TC 13 International Conference on Human-Computer Interaction, INTERACT 2021, held in September 2021 in Bari, Italy. The University of Bari Aldo Moro organized INTERACT 2021 in cooperation with ACM and ACM SIGCHI.

Seven IFIP TC 13 workshops were held at INTERACT 2021. They had various aims, which are listed below.

- WG 13.1 Workshop on Human-centred Technology for Sustainable Development Goals: Challenges and Opportunities (HCT4SDG)—to build an agenda defining challenges and opportunities for the design of interactive technologies addressing one or more United Nations’ Sustainable Development Goals.
- WG 13.2 Workshop on Human-Centered Software Engineering for Changing Contexts of Use—to share knowledge and experiences that address how to deal with evolving contexts of use in today’s and future application domains and the influence on human-centered socio-technical system design and development practices.
- WG 13.4/2.7 and WG 13.1 Joint Workshop on HCI Engineering Education for developers, designers and more (HCI-E²)—to identify, examine, structure, and share educational resources and approaches to support the process of teaching and learning human-computer interaction engineering (HCI-E).
- WG 13.5 Workshop on Control Rooms in Safety Critical Contexts: Design, Engineering and Evaluation Issues—to share experiences in designing, implementing, and evaluating interactive systems in control rooms.
- WG 13.6 Workshop on Pilot Implementation: Testing Human-Work Interaction Designs (PILOT4HWID)—to help mature and formulate the research agenda on the pilot implementation technique for evaluating human-work interaction designs during the process of their development and implementation.
- WG 13.7 Workshop on Wearables, Humans, and Things: Addressing Problems in Education—to discuss new ideas on how wearable or even implantable devices can be used in an educational context (collocated with HCI-E²).
- WG 13.8 Workshop on Geopolitical Issues in Human Computer Interaction—to explore, address, and discuss geopolitical issues in human-computer interaction as a field of knowledge and practice.

The chapters in this volume are the outcome of a thorough and competitive selection process that started with selecting workshops for INTERACT 2021. The IFIP TC 13 WGs organizers were encouraged to propose workshops for extending the work of the working groups. The workshops could be in diverse formats, including paper and poster presentations followed by forum discussions or collaboration sessions with participants. All the workshops were held both on-site and online. The workshop selection process was juried by the INTERACT 2021 workshop co-chairs.

The workshop organizers selected the technical programs, and also picked which workshop papers were eligible for being extended to chapters in this volume. For the selected papers, authors were requested to revise their contributions taking into account the comments and remarks they received during the event. To ensure the quality of these post-proceedings, we requested that the proposed chapters were peer-reviewed by the workshop organizers. In addition, workshop organizers were invited to write a summary chapter for their workshop, reporting on the aims and outcomes of the workshops. We received summary chapters from five workshops, which were reviewed by the INTERACT 2021 workshop co-chairs.

The selected chapters in this volume show the state of the art of research according to the aims of the workshops and demonstrate the maturity of the work performed by IFIP TC 13 WGs. In total, 45 chapters are published in this volume, which are organized into seven sections corresponding to the IFIP TC 13 workshops held at INTERACT 2021.

Interested readers of this volume should note that IFIP TC 13 WGs are open to new members. The full list of IFIP TC13 WGs is available at <http://ifip-tc13.org/working-groups/>. Please contact the officers of the WGs for further information on how to get enrolled in WG activities such as the workshops organized at the INTERACT conference.

January 2022

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WG 13.1 Workshop on Human-centred Technology for Sustainable Development Goals: Challenges and Opportunities (HCT4SDG)

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Kamila Rodrigues	University of São Paulo, Brazil
Masood Masoodian	Aalto University, Finland

WG 13.2 Workshop on Human-Centered Software Engineering for Changing Contexts of Use

Carmelo Ardito	Polytechnic University of Bari, Italy
Regina Bernhaupt	Eindhoven University of Technology, The Netherlands
Stefan Sauer	Paderborn University, Germany

WG 13.4/2.7 and WG 13.1 Joint Workshop on HCI Engineering Education for Developers, Designers and More (HCI-E²)

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WG 13.5 Workshop on Control Rooms in Safety Critical Contexts: Design, Engineering and Evaluation Issues

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Susanne Boll University of Oldenburg, Germany
Chris Johnson Queen’s University Belfast, UK
Kristof Van Laerhoven University of Siegen, Germany

WG 13.6 Workshop on Pilot Implementation: Testing Human-Work Interaction Designs (PILOT4HWID)

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José Abdelnour Nocera University of West London, UK
Ganesh Bhutkar Vishwakarma Institute of Technology, India
Arminda Guerra Lopes Polytechnic Institute of Castelo Branco, Portugal

WG 13.7 Workshop on Wearables, Humans, and Things: Addressing Problems in Education

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Achim Ebert University of Kaiserslautern, Germany
Nahum Gershon The MITRE Corporation, USA
Peter Dannenmann RheinMain University of Applied Sciences, Germany

WG 13.8 Workshop on Geopolitical Issues in Human Computer Interaction

José Abdelnour Nocera University of West London, UK, and ITI/Larsys, Portugal
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IFIP TC 13

Established in 1989, the Technical Committee on Human–Computer Interaction (IFIP TC 13) of the International Federation for Information Processing (IFIP) is an international committee of 34 member societies and 10 Working Groups, representing specialists of the various disciplines contributing to the field of human–computer interaction. This includes (among others) human factors, ergonomics, cognitive science, and multiple areas of computer science and design.

IFIP TC 13 aims to develop the science, technology, and societal aspects of human–computer interaction (HCI) by

- encouraging empirical, applied, and theoretical research,
- promoting the use of knowledge and methods from both human sciences and computer sciences in design, development, evaluation, and exploitation of computing systems,
- promoting the production of new knowledge in the area of interactive computing systems engineering,
- promoting better understanding of the relation between formal design methods and system usability, user experience, accessibility, and acceptability,
- developing guidelines, models, and methods by which designers may provide better human-oriented computing systems, and
- cooperating with other groups, inside and outside IFIP, to promote user-orientation and humanization in system design.

Thus, TC 13 seeks to improve interactions between people and computing systems, to encourage the growth of HCI research and its practice in industry, and to disseminate these benefits worldwide.

The main orientation is to place the users at the center of the development process. Areas of study include

- the problems people face when interacting with computing devices;
- the impact of technology deployment on people in individual and organizational contexts;
- the determinants of utility, usability, acceptability, accessibility, privacy, user experience...;
- the appropriate allocation of tasks between computing systems and users, especially in the case of automation;
- engineering user interfaces, interactions, and interactive computing systems;
- modelling the user, their tasks, and the interactive system to aid better system design; and
- harmonizing the computing system to user characteristics and needs.

While the scope is thus set wide, with a tendency toward general principles rather than particular systems, it is recognized that progress will only be achieved through both general studies to advance theoretical understanding and specific studies on practical issues

(e.g., interface design standards, software system resilience, documentation, training material, appropriateness of alternative interaction technologies, guidelines, integrating computing systems to match user needs and organizational practices, etc.).

In 2015, TC 13 approved the creation of a Steering Committee (SC) for the INTERACT conference series. The SC is now in place, chaired by Anirudha Joshi, and is responsible for

- promoting and maintaining the INTERACT conference as the premier venue for researchers and practitioners interested in the topics of the conference (this requires a refinement of the topics above);
- ensuring the highest quality for the contents of the event;
- setting up the bidding process to handle the future INTERACT conferences (with decisions made at the TC 13 level);
- providing advice to the current and future chairs and organizers of the INTERACT conference;
- providing data, tools, and documents about previous conferences to the future conference organizers;
- selecting the reviewing system to be used throughout the conference (as this affects the entire set of reviewers, authors, and committee members);
- resolving general issues involved with the INTERACT conference; and
- capitalizing on history (good and bad practices).

In 1999, TC 13 initiated a special IFIP award, the Brian Shackel Award, for the most outstanding contribution in the form of a refereed paper submitted to and delivered at each INTERACT. The award draws attention to the need for a comprehensive human-centered approach in the design and use of information technology in which the human and social implications have been taken into account. In 2007, IFIP TC 13 launched an Accessibility Award to recognize an outstanding contribution in HCI with international impact dedicated to the field of accessibility for disabled users. In 2013, IFIP TC 13 launched the Interaction Design for International Development (IDID) Award that recognizes the most outstanding contribution to the application of interactive systems for social and economic development of people in developing countries. Since the process to decide the awards takes place after papers are sent to the publisher for publication, the awards are not identified in the proceedings. Since 2019, a special agreement has been in place with the International Journal of Behaviour and Information Technology (BIT), published by Taylor and Francis with Panos Markopoulos as editor in chief. In this agreement, authors of BIT papers whose work is within the field of HCI are offered the opportunity to present their work at the INTERACT conference. Reciprocally, the authors of a selection of papers accepted for presentation at INTERACT are offered the opportunity to extend their contributions to be published in BIT.

IFIP TC 13 also recognizes pioneers in the area of HCI. An IFIP TC 13 pioneer is one who, through active participation in IFIP Technical Committees or related IFIP groups, has made outstanding contributions to the educational, theoretical, technical, commercial, or professional aspects of analysis, design, construction, evaluation, and use of interactive systems. IFIP TC 13 pioneers are appointed annually and awards are handed over at the INTERACT conference.

IFIP TC 13 stimulates working events and activities through its Working Groups (WGs). Working Groups consist of HCI experts from multiple countries who seek to expand knowledge and find solutions to HCI issues and concerns within a specific domain. New Working Groups are formed as areas of significance in HCI arise.

Further information is available at the IFIP TC13 website: <http://ifip-tc13.org/>.

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WG 13.4/WG 2.7 - User Interface Engineering

The Working Group 13.4 (also WG 2.7) investigates the nature, concepts, and construction of user interfaces (UIs) for software systems, using a framework for reasoning about interactive systems and an engineering model for developing UIs.

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WG 13.5 - Resilience, Reliability, Safety and Human Error in System Development

The Working Group 13.5 seeks a framework for studying human factors relating to systems failure, develops leading edge techniques in hazard analysis and safety engineering of computer-based systems, and guides international accreditation activities for safety-critical systems.

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The Working Group 13.5 aims at establishing relationships between extensive empirical work-domain studies and HCI design. It promotes the use of knowledge, concepts, methods, and techniques that enable user studies to procure a better apprehension of the complex interplay between individual, social, and organizational contexts and thereby a better understanding of how and why people work in the ways that they do.

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WG 13.7 - Human-Computer Interaction and Visualization

The Working Group 13.7 aims to establish a study and research program that will combine both scientific work and practical applications in the fields of human-computer interaction and visualization. It will integrate several additional aspects of further research areas, such as scientific visualization, data mining, information design, computer graphics, cognition sciences, perception theory, or psychology, into this approach.

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WG 13.8 - Interaction Design and International Development

The Working Group 13.8 aims at supporting and developing the research, practice, and education capabilities of HCI in institutions and organizations based around the world taking into account their diverse local needs and cultural perspectives; promoting application of interaction design research, practice, and education to address the needs, desires and aspirations of people across the developing world; and developing links between the HCI community in general and other relevant communities involved in international development and cross-cultural aspects of ICT development.

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IIT Bombay, India

WG 13.9 - Interaction Design and Children

The Working Group 13.9 aims to support practitioners, regulators, and researchers to develop the study of interaction design and children across international contexts.

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Eindhoven University of Technology,
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WG 13.10 - Human-Centred Technology for Sustainability

The Working Group 13.10 aims to promote research, design, development, evaluation, and deployment of human-centered technology to encourage sustainable use of resources in various domains.

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