

# CHItaly 2021 - Frontiers of HCI

11-13 July, Bozen-Bolzano (Italy) and online (www)

---

## Proceedings of the 14<sup>th</sup> Biannual Conference of the Italian SIGCHI Chapter

CHItaly '21, 11-13 July 2021, Bozen-Bolzano, Italy, and online (www)

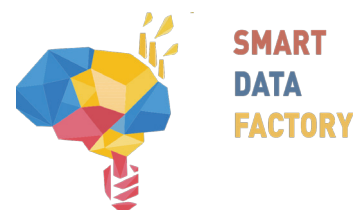
**General Chairs:** Antonella De Angeli and Luca Chittaro

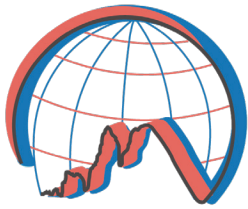
**Long Research Papers Chairs:** Rosella Gennari, Maria De Marsico

**Short Research Papers Chairs:** Alessandra Melonio, Cristina Gena

**Proceedings Chairs:** Luigi De Russis, Lucio Davide Spano

**Organisers and sponsors:**





# CHItaly 2021 - Frontiers of HCI

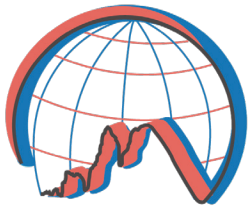
11-13 July, Bozen-Bolzano (Italy) and online (www)

---



*In memory of Gregorio Convertino  
(1972-2021)*

We dedicate CHItaly21 to Gregorio, the Italian pioneer who chartered frontiers of common-ground, awareness and collective intelligence around the USA building bridges between theory and practice, industrial needs and academic rigour. Not only was Gregorio an excellent manager and a fine scholar, he truly was a wonderful person who will be deeply missed.



# CHIItaly 2021 - Frontiers of HCI

11-13 July, Bozen-Bolzano (Italy) and online (www)

---

## Foreword

### CHIItaly 2021: Frontiers of Human-Computer Interaction

*Rosella Gennari, Maria De Marsico, Alessandra Melonio, Cristina Gena, Luigi De Russis, Lucio Davide Spano, Luca Chittaro and Antonella De Angeli*

*Where are the frontiers of Human-Computer Interaction? What theories, methodologies, tools, and sensitivities do researchers, designers and practitioners need to explore uncharted territories?* These are the questions that inspired CHIItaly 2021, the 14th edition of the biannual conference of the Italian SIGCHI Chapter. Some initial answers are documented in the proceedings and summarised in this foreword alongside a reflection on future frontiers of hybrid scientific conferences.

The original focus of inquiry was on transcending disciplinary, communication and national boundaries, reaching out to new scholars, engaging the public, and supporting internationalisation. The COVID-19 pandemics abruptly challenged us to explore unexpected frontiers of space and time in evolving virtualities fraught with uncertainties. Unlike most human-computer interaction conferences, CHIItaly 2021 was planned as a hybrid meeting with the aim of reconfiguring physical and digital spaces to mutual benefit. The Free University of Bozen-Bolzano infrastructured the physical space for scholars and citizens within changing local, national and international safety legislation. The technical chair (Fabio Butussi) and the digital frontiers chairs (Fabio Morreale and Ilaria Torre) infrastructured the connection between Bozen-Bolzano and the rest of the world.

The conference started on July the 11th with the first edition of the Interactive Experiences track at CHIItaly. Maria Menéndez-Blanco, Ceçil Uğur Yavuz and Jennifer Schubert curated this hybrid exhibition to connect artists, the conference attendees, the local population and the virtual public. It included eleven artefacts authored by international artists, researchers and designers to spark foundational critical discourses, such as reflections on AI and user profiling, human-technology symbiosis, and digital obsolescence. In parallel, six workshops (selected by Barbara Rita Barricelli and Catia Prandi) provided the venues for speculating about equality, diversity and inclusion in machine learning and virtual reality, imagining trans-urban futures, reflecting on socio-political consequences of digitalisation in rural regions, and exploring the space of outdoors-related HCI, virtual games and extended realities. Finally, the doctoral colloquium, chaired by Fabio Paternò and Daniela Fogli, provided a venue for young researchers to share and refine their work.

Prof. Albrecht Schmidt opened the conference with a keynote about the effect of AI on serendipity while exploring the overlapping frontiers between recommendations, choices and chances in human behaviour. The scientific program consisted of 13 long papers (about 24% acceptance rate) and 22 short papers selected from all the remaining long and short-paper submissions. The final resulting overall acceptance rate is about 42%. Following the conference theme, they addressed cognitive, societal and technological frontiers between HCI & Education, HCI & AI, and HCI & well-being, with a unique focus on equality, diversity, and inclusion of heterogeneous users. Finally, Prof. Paola Bertola closed the conference with a keynote on the influence of big data on fashion, reflecting on how active customers may give rise to virtual communities of practice that promote sustainability and equality principles.

When writing this editorial, CHIItaly 2021 eagerly awaits its participants for an inspirational and engaging meeting. Several indicators show that the conference has successfully mobilised a diverse, international audience. Thanks to the publicity chairs (Mehdi Rizvi and Federica Caruso) and the website chair (Eftychia Roumelioti), the call for contributions exceeded expectations. CHIItaly 2021 achieved the highest number of contributions ever recorded by the Italian SIGCHI Conference. They included 83 papers (54 long and 29 short), 11 workshops, 15 interactive experience contributions, 11 doctoral consortium abstracts. Around half of the papers were authored by Italian scholars, 37% by European Scholars, 8% American and 6% Asian scholars.

The scientific reputation of SIGCHI Italy and the effort of the internationalisation chairs (Andreas Bollin, Fernando de la Prieta Pintado, Netta Iivari, and Valentina Nisi) played an instrumental role in this achievement. Nevertheless, such an outstanding performance warrants speculation on the impact of hybrid conferences in opening up local academic communities, increasing the number of voices and democratising participation across boundaries of space, time, economic and environmental resources. Thanks to the sponsorship of Sparkasse and the Free University of Bozen-Bolzano CHIItaly 2021 offered very competitive fees to both physical and virtual attendees, challenging economic models of scientific dissemination in practice and pioneering the frontiers of post-COVID HCI conferences.

# Organizing Committee

## Steering Committee

Maristella Matera  
Politecnico di Milano  
maristella.matera@polimi.it

Massimo Zancanaro  
University of Trento  
massimo.zancanaro@unitn.it

## General Chairs

Antonella De Angeli  
Free University of Bozen-Bolzano  
antonella.deangeli@unibz.it

Luca Chittaro  
University of Udine  
luca.chittaro@uniud.it

## Long Research Paper Chairs

Rosella Gennari  
Free University of Bozen-Bolzano  
gennari@inf.unibz.it

Maria De Marsico  
Sapienza University of Rome  
demarsico@di.uniroma1.it

## Short Research Paper Chairs

Alessandra Melonio  
Free University of Bozen-Bolzano  
alessandra.melonio@unibz.it

Cristina Gena  
University of Torino  
cristina.gena@unito.it

## Digital Frontiers Chairs

Ilaria Torre  
University of Genova  
ilaria.torre@unige.it

Fabio Morreale  
University of Auckland  
f.morreale@auckland.ac.nz

## Internationalisation Chairs

Andreas Bollin  
University of Klagenfurt, Austria  
andreas.bollin@aau.at

Netta Iivari  
University of Oulu, Finland  
netta.iivari@oulu.fi

Valentina Nisi  
University of Lisboa, Portugal  
valentina.nisi@tecnico.ulisboa.pt

Fernando De La Prieta Pintado  
University of Salamanca, Spain  
fer@usal.es

## Proceedings and Accessibility Chairs

Luigi De Russis  
Politecnico di Torino  
luigi.derussis@polito.it

Lucio Davide Spano  
University of Cagliari  
davide.spano@unica.it

## Interactive Experiences Chairs

María Menéndez-Blanco  
Free University of Bozen-Bolzano  
maria.menendezblanco@unibz.it

Seçil Uğur Yavuz  
Design & Arts, Free University of Bozen-Bolzano  
secil.uguryavuz@unibz.it

Jennifer Schubert  
Design & Arts, Free University of Bozen-Bolzano  
jschubert@unibz.it

## Workshop Chairs

Barbara Rita Barricelli  
University of Brescia  
barbara.barricelli@unibs.it

Catia Prandi  
University of Bologna  
catia.prandi2@unibo.it

## Doctoral Consortium Chairs

Daniela Fogli  
University of Brescia  
daniela.fogli@unibs.it

Fabio Paternò  
CNR-ISTI  
fabio.paterno@isti.cnr.it

## Publicity Chairs

Mehdi Rizvi  
Politecnico di Milano  
syedmehdi.rizvi@polimi.it

Federica Caruso  
University of L'Aquila  
federica.caruso1@graduate.univaq.it

## Sponsors Chairs

Floriano Zini  
Free University of Bozen-Bolzano  
floriano.zini@unibz.it

Angela Locoro  
Carlo Cattaneo University - LIUC  
alocoro@liuc.it

## Technical Chairs

Fabio Buttussi  
University of Udine  
fabio.buttussi@uniud.it

Christian Zeni  
Free University of Bozen-Bolzano  
christian.zeni@unibz.it

## **Local Chair**

Hannes Hell

Free University of Bozen-Bolzano  
hannes.hell@unibz.it

## **Webmaster**

Eftychia Roumelioti

Free University of Bozen-Bolzano  
eroumelioti@unibz.it

# Program Committee

- Ignacio Aedo, University Carlos III of Madrid
- Margherita Antona, ICS-FORTH
- Barbara Rita Barricelli, University of Brescia
- Andreas Bollin, University of Klagenfurt
- Letizia Bollini, Free University of Bozen-Bolzano
- Elizabeth Bonsignore, University of Maryland
- Yuri Borgianni, Free University of Bozen-Bolzano
- Stefano Burigat, University of Udine
- Marina Buzzi, IIT-CNR
- Maria Claudia Buzzi, IIT-CNR
- Federica Caruso, University of L'Aquila
- Tiziana Catarci, Sapienza University of Rome
- Federica Cena, University of Torino
- Luca Chittaro, University of Udine
- César Alberto Collazos, University of Cauca
- Maria Francesca Costabile, University of Bari
- Daniela D'Auria, Free University of Bozen-Bolzano
- Berardina Nadja De Carolis, University of Bari
- Fernando De La Prieta Pintado, University of Salamanca
- Maria De Marsico, Sapienza University of Rome
- Luigi De Russis, Politecnico di Torino
- Giuseppe Desolda, University of Bari
- Tania Di Mascio, University of l'Aquila
- Paloma Díaz, UC3M
- Monica Divitini, Norwegian University of Science and Technology
- Gabriella Doderò, ASLERD
- Emmanuel Dubois, IRIT, Elipse, University of Toulouse
- Mehdi Elahi, University of Bergen
- Daniela Fogli, University of Brescia
- Rita Francese, University of Salerno
- Franca Garzotto, Politecnico di Milano
- Cristina Gena, University of Torino
- Rosella Gennari, Free University of Bozen-Bolzano
- Walter Gerbino, University of Trieste



- Michail Giannakos, Norwegian University of Science and Technology
- Carina Soledad González González, University of La Laguna
- Eelco Herder, Radboud University
- Netta Iivari, University of Oulu
- Mladjan Jovanovic, Singidunum University, Belgrade
- Tsvi Kuflik, The University of Haifa
- Rosa Lanzilotti, University of Bari
- Chiara Leonardi, Bruno Kessler Foundation
- Barbara Leporini, ISTI-CNR
- Angela Locoro, Carlo Cattaneo University
- Marco Manca, ISTI-CNR
- Maurizio Mancini, Sapienza University of Rome
- Ivana Marenzi, L3S Research Center
- Raul Masu, Nova University of Lisbon
- Maristella Matera, Politecnico di Milano
- Alessandra Melonio, Free University of Bozen-Bolzano
- Eleonora Mencarini, University of Trento
- Marcelo Milrad, Linnaeus University
- Giulio Mori, ISTI-CNR
- Fabio Morreale, University of Auckland
- Elena Not, Bruno Kessler Foundation
- Emanuele Panizzi, Sapienza University of Rome
- Fabio Paternó, ISTI-CNR
- Maria Angela Pellegrino, University of Salerno
- Fabio Pittarello, Ca' Foscari University of Venice
- Elvira Popescu, University of Craiova
- Marco Porta, University of Pavia
- Catia Prandi, University of Bologna
- Amon Rapp, University of Torino
- Daniele Riboni, University of Cagliari
- Francesco Ricci, Free University of Bozen-Bolzano
- Laura Anna Ripamonti, University of Milan
- Mehdi Rizvi, Politecnico di Milano
- Eftychia Roumelioti, Free University of Bozen-Bolzano
- Giuseppe Sansonetti, Roma Tre University
- Carmen Santoro, ISTI-CNR

- Riccardo Scateni, University of Cagliari
- Gianluca Schiavo, University of Trento
- Jennifer Schubert, Free University of Bozen-Bolzano
- Alessandro Soro, Queensland University of Technology
- Anna Spagnolli, University of Padova
- Lucio Davide Spano, University of Cagliari
- Laura Tarantino, University of l'Aquila
- Marco Temperini, Sapienza University of Rome
- Marko Tkalcic, University of Primorska
- Ilaria Torre, University of Genova
- Genny Tortora, University of Salerno
- Seçil Uğur Yavuz, Free University of Bozen-Bolzano
- Stefano Valtolina, University of Milan
- Fabiana Vernerio, University of Torino
- Giuliana Vitiello, University of Salerno
- Pierpaolo Vittorini, University of L'Aquila
- Gualtiero Volpe, InfoMus, DIST, University of Genoa
- Max Willis, University of Trento
- Massimo Zancanaro, University of Trento
- Floriano Zini, Free University of Bozen-Bolzano

# Table of Contents

## SESSION: Keynotes

- 1. The End of Serendipity: Will Artificial Intelligence Remove Chance and Choice in Everyday Life?**  
*Albrecht Schmidt*
- 2. Fashion Within the Big Data Society: How can Data Enable Fashion Transition Towards a More Meaningful and Sustainable Paradigm?**  
*Paola Bertola*

## SESSION: Long Papers

- 3. Automated Feedback to Students in Data Science Assignments: Improved Implementation and Results**  
*Alessandra Galassi, Pierpaolo Vittorini*
- 4. Wearable Mapping Suit: Body Mapping for Identification Wearables**  
*Marie Beuthel, Friederike Fröbel, Gesche Joost*
- 5. Complementing Studies on Vulnerable Youths with Reddit Data**  
*Andrea Mauri, Achilleas Psyllidis, Alessandro Bozzon, Ju-Sung Lee, Jason Pridmore, Liesbet van Zoonen, Sarah Giest*
- 6. Comparing Persona Analytics and Social Media Analytics for a User-Centric Task Using Eye-Tracking and Think-Aloud**  
*Joni Salminen, Sercan Şengün, Soon-Gyo Jung, Bernard J. Jansen*
- 7. Supporting Depression Screening with Multimodal Emotion Detection**  
*Rita Francese, Pasquale Attanasio*
- 8. Pict-Place Authentication: Recognition-based Graphical Password using Image Layout for Better Balance of Security and Operation Time**  
*Tetsuji Takada, Mitsuhiro Yoshida*
- 9. The Influence of Personas' Gender in Design**  
*Milena Ribeiro Lopes, Carl Vogel*
- 10. Bringing Human-Centredness to Technologies for Buildings: An Agenda for Linking New Types of Data to the Challenge of Sustainability**  
*Clara Vite, Anca-Simona Horvath, Gina Neff, Naja L. Holten Møller*
- 11. The Use of Interactive Technologies for Education in Pandemic and Post-Pandemic Contexts: Design Implications**  
*Duarte L. Sousa, Pedro F. Campos, Sónia Matos*
- 12. Unpacking the Challenges and Future of Assistive Technology Adaptation by Occupational Therapists**  
*Leila Aflatoony, Shreya Shenai*
- 13. 'Thinking Problematically' as a Resource for AI Design in Politicised Contexts**  
*Anette C. M. Petersen, Marisa Leavitt Cohn, Thomas T. Hildebrandt, Naja Holten Møller*
- 14. HCI in K12 Computer Science Education – Using HCI as a Topic and a Didactic Tool**  
*Andreas Bollin, Max Kesselbacher, Nina Lobnig, Stefan Pasterk, Elisa Reci, Markus Wieser*

**15. Design of a Recommender System for Video Games based on In-Game Player Profiling and Activities**

*Lorenzo De Simone, Davide Gadia, Dario Maggiorini, Laura Anna Ripamonti*

**SESSION: Short Papers**

**16. At the Frontiers of Art and IoT: the IoTgo Toolkit as a Probe for Artists**

*Rosella Gennari, Mehdi Rizvi*

**17. The AI Style Experience: Design and Formative Evaluation of a Novel *Phygital* Technology for the Retail Environment**

*David Harrison Ferrell II, Giorgio Grando, Massimo Zancanaro*

**18. Forward Reasoning Decision Support: Toward a More Complete View of the Human-AI Interaction Design Space**

*Zelun Tony Zhang, Yuanting Liu, Heinrich Hußmann*

**19. Charlie: A Chatbot to Improve the Elderly Quality of Life and to Make Them More Active to Fight Their Sense of Loneliness**

*Stefano Valtolina, Liliana Hu*

**20. Engaging Children in Remotely Ideating and Programming Smart Things**

*Maria Angela Pellegrino, Eftychia Roumelioti, Mauro D'Angelo, Rosella Gennari*

**21. Virtual Assistants for Personalizing IoT Ecosystems: Challenges and Opportunities**

*Barbara Rita Barricelli, Daniela Fogli*

**22. Automatic Emotion Recognition from Facial Expressions when Wearing a Mask**

*Giovanna Castellano, Berardina De Carolis, Nicola Macchiarulo*

**23. Expressive Digital Place Making as Means of Aggregation: A Case Study from the COVID-19 Pandemic**

*Beatrice Gobbo, Andrea Benedetti*

**24. A Qualitative Analysis of Users' Attitudes Towards the Italian Contact Tracing App**

*Cristina Bosco, Martina Cvajner*

**25. Challenges for Recommender Systems Evaluation**

*Francesco Ricci, David Massimo, Antonella De Angeli*

**26. Player Behaviour Metrics for Adjusting Content in VR Games: The Case of Fear**

*Stefano Palma, Laura Anna Ripamonti, Alberto Nunzio Borghese, Davide Gadia, Dario Maggiorini*

**27. VoiceWriting: A Completely Speech-based Text Editor**

*Maria De Marsico, Francesca Romana Mattei*

**28. Boris: a Spoken Conversational Agent for Music Production for People with Motor Disabilities**

*Fabio Catania, Pietro Crovari, Eleonora Beccaluva, Giorgio De Luca, Erica Colombo, Nicola Bombaci, Franca Garzotto*

**29. What is it Like to be a UX Designer in Italy? An Initial Analysis of Job Advertisements to Improve Training and Education in HCI**

*Ana Dalila Butiurca, Massimo Zancanaro*

**30. Reporting Revenge Porn: a Preliminary Expert Analysis**

*Antonella De Angeli, Mattia Falduti, Maria Menendez Blanco, Sergio Tessaris*

31. **Visual Analysis of Goal-Leading Phases in Soccer**  
*Paolo Buono, Miguel Ceriani, Maria F. Costabile, Paola Valdivia*
32. **Sail with Columbus: Navigation through Tangible and Interactive Storytelling**  
*Luca Ciotoli, Mortaza Alinam, Ilaria Torre*
33. **MONICA Vision: An Approach, a Model and the Interactive Tools for Cyber-Physical Systems Designers**  
*Federica Caruso, Tania Di Mascio, Giacomo Valente, Laura Tarantino*
34. **Pandemics throughout History and Geography – An Interactive Environment to Educate the New Generation of Students**  
*Marianna Di Gregorio, Monica Sebillio, Genny Tortora, Giuliana Vitiello*
35. **Realizing Ontology-based Reusable Interfaces for Data Access via Virtual Knowledge Graphs**  
*Diego Calvanese, Linfang Ding, Alessandro Mosca, Guohui Xiao*
36. **A System to Support Children in Speech Therapies at Home**  
*Giuseppe Desolda, Rosa Lanzilotti, Antonio Piccinno, Veronica Rossano*
37. **Integrating Security and Privacy in HCD-Scrum**  
*Maria Teresa Baldassarre, Vita Santa Barletta, Danilo Caivano, Antonio Piccinno*

## **SESSION: Workshops**

38. **VR-ISLAND: Virtual Reality, Inclusion and Special Language Needs**  
*Giulia Staggini, Rita Cersosimo*
39. **Critical Tools for Machine Learning: Situating, Figuring, Diffracting, Fabulating Machine Learning Systems Design**  
*Goda Klumbytė, Claude Draude, Alex Taylor*
40. **The Role of Digitalization in Improving the Quality of Live in Rural (Industrialized) Regions**  
*David Unbehau, Volker Wulf, Johannes Schädler, Myriam Lewkowicz, Chiara Bassetti, Mark Ackerman*
41. **Joint workshop on Games-Human Interaction (GHItaly21) and Multi-party Interaction in eXtended Reality (MIXR)**  
*Laura Anna Ripamonti, Davide Gadia, Dario Meggiorini, Ilaria Mariani, Maria De Marsico, Maurizio Mancini, Fabio Pellacini, Giovanna Varni, David Murphy, Laura Maye, Patrick O’Toole*
42. **Designing for/with/around Nature: Exploring new Frontiers of Outdoor-related HCI**  
*Eleonora Mencarini, Amon Rapp, Linda Tonolli, Maurizio Teli, Roberto Cibir, Vincenzo D’Andrea, Massimo Zancanaro*

## **SESSION: Interactive Experiences**

43. **Interactive Experiences**  
*Maria Menendez-Blanco, Secil Ugur Yavuz, Jennifer Liesbeth Schubert*