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Chatbot Research and Design


4th International Workshop, CONVERSATIONS 2020
Virtual Event, November 23–24, 2020
Revised Selected Papers


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Preface

Introduction

Chatbots see continued uptake in a range of application areas. Spurred by interest from industry and service providers, chatbot research is a rapidly growing field with an exponential increase in scientific publications in the last few years. Research areas span from the examination of evolving patterns of use and user experience (UX) to conversational design and studies about the technologies underpinning chatbots such as natural language processing and machine learning. Research also increasingly addresses specific application areas and use cases. For example, research on social and relational chatbots is receiving growing attention; so are chatbots in areas such as customer service, education, health, and commerce. Research is also addressing the potential social implications of chatbots, exploring how chatbots impact individuals' patterns of technology use, how chatbots can provide information and support in challenging situations – such as the ongoing COVID-19 pandemic – and how to facilitate compliance with ethical norms or avoid ethical and normative pitfalls in chatbot development and applications.

In consequence of the increased interest in chatbot research, and the potential social and industrial impact of conversational technology, there is a need to establish arenas for chatbot researchers and practitioners to share, discuss, and collaborate. This is particularly important given the interdisciplinary nature of this field of research, spanning disciplines within the humanities, social sciences, human-computer interaction, technology research, design, and management.

Motivated by this need, we established an international workshop series for chatbot researchers to share work and experiences with fellow researchers, students, and practitioners. CONVERSATIONS 2020 (<https://conversations2020.wordpress.com/>) was the fourth event in this series, held on November 23-24, 2020. The University of Amsterdam hosted the workshop, in collaboration with SINTEF, CERTH, University of Leicester, University of Edinburgh, University of Agder, and University of Oslo. This year the workshop was organized as a fully virtual online event due to the COVID-19 pandemic. In total 150 participants from 31 countries registered for the online workshop.

Paper Invitation, Review, and Revision

We distributed the workshop call for papers to researchers in the field of chatbot research, and to relevant general mailing lists within fields such as human-computer interaction and information systems research. In the call for papers, three submission categories were outlined: Full papers, position papers, and demos. In total, 36 submissions were made to the workshop: 26 full papers, eight position papers, and two demos. A rigorous double-blind review process was conducted with three independent reviewers from the program committee providing detailed feedback on each submission. In addition, each paper was appointed a review lead from the group of workshop organizers coordinating the review process for the paper, proposing a decision

recommendation, and providing meta-reviews for accepted papers. Acceptance decisions were made in a dedicated workshop organizers meeting.

Fourteen of the papers were accepted as full papers. Two were accepted without changes, eight followed requests for minor revision, and four followed requests for major revision. Revised papers were checked for compliance with change requests prior to final acceptance. When necessary, a second round of revisions was requested. The acceptance rate for full papers was 54%, which is lower than for previous editions of the workshop.

For submissions authored by a workshop organizer, review and decision making was conducted by other organizers and blinded to the authoring organizer.

Workshop Outcomes

Over the two days, the workshop program included two keynote speakers, three groupworks, and six paper sessions. The workshop keynote speakers were Q. Vera Liao, IBM research AI, and Björn Schuller, Imperial College London and University of Augsburg. The three workshop groupworks addressed different topics: *chatbot development*, led by Raphael Meyer von Wolff and Sebastian Hobert, University of Göttingen, *chatbot concept co-creation*, led by Federica Tazzi, Assist Digital, and *chatbot ethics*, led by Symeon Papadopoulos, CERTH, Asbjørn Følstad, SINTEF, and Effie L.-C. Law, University of Leicester. The paper sessions included full papers and position papers. The final versions of the full papers are included in these proceedings.

The papers in the proceedings are structured in four topical groups: Chatbot UX and user perceptions, social and relational chatbots, chatbot applications, and chatbots for customer service. The papers provide new knowledge through empirical, theoretical, or design contributions.

Under the topic of *chatbot UX and user perceptions* five papers addressed the impact of chatbot self-presentation and communication style, as well as users' perceptions of chatbots and guidelines for chatbot design. De Cicco et al. presented an empirical study on how chatbots disclosing themselves impact trust, social presence, and attitudes towards online retailers. Liebrecht et al. studied how varying levels of formality in chatbot communication affect social presence, brand attitude, and quality of interaction. Ruane et al. showed how variations in chatbot and user personality can affect user experience. Etzrodt presented findings concerning users relating to chatbots as things, as persons, or as something in between – personified things. Finally, Crovari et al. discussed a set of guidelines on how to design for chatbots applied in a multi-modal context.

Three papers addressed *social and relational chatbots*, a topic of substantial current relevance following recent work on open-domain chatbots from Google and Facebook as well as the increased uptake of companion chatbots such as Replika. Croes and Antheunis presented a study comparing users' willingness to disclose information about themselves to chatbots or human conversation partners, van Wezel et al. surveyed the literature on social support in chatbots, and Löw et al. presented a design case of using a chatbot to strengthen social relations among university freshmen as part of a scavenger hunt.

Six of the papers addressed different applications for chatbots. Three of these are included in the general topic *chatbot applications* and three are included in the more

specific topic of *chatbots for customer service*. In the first cluster of papers, Höhn and Bongard-Blanchy presented a timely study on current chatbots providing information and support on COVID-19, Klopfenstein and Di Lorenzi presented a prototype chatbot design for presenting interactive narratives, and Catania et al. presented a prototype chatbot for teaching bodily concepts to children. In the cluster on chatbots for customer service, Janssen et al. presented a review of chatbots for business-to-business support, van der Goot et al. presented a study of users' perceptions of chatbots as part of a customer journey, and Kvale et al. presented a study exploring customer satisfaction scores as a source for insight into chatbot user experience.

New at this year's CONVERSATIONS workshop was a best paper award. Three papers with the highest review score were nominated for the award. Of these, one was selected as best paper based on rankings made independently by the workshop organizers. The best paper award was granted to Antje Janssen, Davinia Rodríguez Cardona, and Michael H. Breitner, for the paper *More than FAQ! Chatbot Taxonomy for Business-to-Business Customer Services*. The other best paper nominees were: Roberta De Cicco, Susana Cristina Lima da Costa e Silva, and Riccardo Palumbo, for the paper *Should a Chatbot Disclose Itself? Implications for an Online Conversational Retailer* and Margot van der Goot, Laura Hafkamp, and Zoë Dankfort, for the paper *Customer Service Chatbots: A Qualitative Interview Study into Customers' Communication Journey*.

The presented papers, along with the groupworks and keynote speakers, made CONVERSATIONS 2020 a successful venue for sharing and discussing chatbot research. Through these proceedings, a key outcome of the workshop – the presented full papers – are made available for a broader audience of chatbot researchers and practitioners, as a basis for future chatbot research. Motivated by the success of this year's workshop, we look forward to the continued sharing of chatbot research also in the coming editions of CONVERSATIONS.

November 2020

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