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Chatbot Research
and Design

Third International Workshop, CONVERSATIONS 2019
Amsterdam, The Netherlands, November 19–20, 2019
Revised Selected Papers

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Preface

Introduction

Chatbots are conversational agents that allow the user access to information and services through natural language dialogue, including text and voice. Research on chatbots has advanced substantially in recent years, both in exploring the developments regarding their design and underlying technology, especially artificial intelligence and machine learning, and in advancing our knowledge about how people use and experience these agents. In addition, the ever-increasing usage of chatbots by people from many walks of life requires us to consider its societal impact and ethical implications. Chatbots are maturing for application areas including education, health, and information services, and may be designed for individual users or for supporting collaboration. They are an important emerging technology with potential to empower citizens to engage in societal issues, customers to obtain information and help from service providers, patients to get critical health-related information or advice, or professionals to get easy access to knowledge or resources for decision-making.

Within this evolving field, it is critical for researchers and practitioners to share findings and experiences, and to discuss challenges and future directions. In particular, we need meeting places that facilitate cross-disciplinary exchange, given the multi-faceted challenges of the field of chatbot research, and their potential for societal impact.

These goals motivated us to organize the third international workshop on chatbot research and practice – CONVERSATIONS 2019 which was held during November 19–20, 2019, at the University of Amsterdam, the Netherlands. Chatbot researchers were invited to share empirical, theoretical, and design results through full and position papers. 50 participants with different backgrounds, including informatics, interaction design, media and communication science, as well as psychology and social sciences, registered for the workshop, reflecting the cross-disciplinary character of this area of interest.

Chatbot research spans a broad range of topics, including user and communication studies, user experience and design, development platforms and frameworks, chatbots in networked collaboration, chatbots for all, and ethics and privacy. On the basis of the results from the two previous CONVERSATIONS workshops, we outlined a set of research challenges to guide the workshop contributions and output in terms of the papers submitted and of group and plenary collaboration.

Paper Invitation, Review, and Revision

We invited researchers within the emerging field of chatbot research to submit papers on novel results from their work. In total, 31 papers were submitted to the workshop; 28 full papers and 3 position papers. A rigorous single-blind review process was conducted. All papers were reviewed by three reviewers with relevant expertise providing detailed feedback to the authors. The reviewers were Program Committee members and workshop organizers.

18 of the papers were accepted as full papers, 10 following requests for minor revision and 8 with requests for major revision. The revised papers were thoroughly checked to ensure they met the quality standard.

For submissions authored by one or more of the workshop organizers, the entire review and decision-making process was led by other organizers without the authoring organizer being involved or given insight.

Workshop Outcomes

The full papers in these proceedings are structured according to three topics within basic chatbot research – user and communication studies, user experience and design, and chatbots for collaboration – as well as two key chatbot application areas – customer service and education. The papers provide valuable new insight into these topics.

Under the topic of User and Communication Studies, Müller et al. applied qualitative comparative analysis to understand user resistance to chatbots for medication, an approach which may be relevant also for user studies in other application domains. Jalota et al. presented an approach to assess chatbots that serve as user interfaces to knowledge repositories, such as the DBpedia chatbot, and Ischen et al. reported on a study of user perceptions of chatbots in commercial contexts, with particular concern for how human-likeness in such chatbots affect privacy perceptions.

User Experience and Design was addressed in four papers. Baez et al. presented an approach to a conversational paradigm in web browsing to particularly benefit visually impaired users but also of relevance to other use cases. Catania et al. reported on a study of users' experiences with a conversational agent for the cognitively impaired, providing rich insight into the variations of how chatbot interaction may be perceived. Contributing to our understanding of how to design for good user experiences in conversations, Liebrecht and Van Hooijdonk leveraged data from web care representatives, identifying conversational characteristics of particular importance. Finally, the question of gender in chatbot design was discussed by Feine et al. in a timely study of a large number of current chatbots.

Four papers concerned the increasingly relevant topic of Chatbots for Collaboration, that is, how chatbots may engage in collaborative relationships with users – individually or in groups. Nordberg et al. presented a study of how chatbots may be useful within online peer support groups, Väänänen et al. investigated how chatbots may encourage and facilitate social participation, and McAllister et al. discussed the benefit

of a chatbot to support therapists preparing for bibliotherapeutic counselling. Heyselaar and Bosse, addressed a precondition for such collaboration: users' perceptions of agency in chatbots and how this may be implicitly studied through a theory of mind task.

Several papers also addressed specific application areas, in particular Customer Service and Education. Within the customer service area, two papers addressed factors affecting chatbot uptake and use for this purpose: Van der Goot and Pilgrim explored the effect of age differences on perceptions of chatbot communication and Laban and Araujo reported on the relationship between service performance evaluation and perceptions of cooperation with the chatbot. The remaining two papers on chatbots for customer service, by Kvale et al. and by Følstad and Tylor, pointed towards the benefits of using chatbot dialogue data to understand and improve such chatbots. Within the education application area, von Wolff et al. presented a study on students' requirements for educational chatbots. Hobert and Berens reported on a field study where an educational chatbot had been applied throughout a full semester university course, and Tegos et al. presented a framework for chatbot applications in massive open online courses (MOOC).

While the immediate tangible outcomes of the workshop are the presented papers, the group and plenary discussions returned an overview of key challenges and directions within the main topics of the emerging field of chatbot research. As such, the discussions at the workshop, in addition to the presented papers, serve as a good basis for future collaborations within this field. We already look forward to continuing the sharing and discussions at CONVERSATIONS 2020 – to be announced.

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Organization

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