Artificial Companion for Second Language Conversation

Sviatlana Höhn

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Chatbots Support Practice Using Conversation Analysis

Springer

Sviatlana Höhn
University of Luxembourg
Esch-sur-Alzette, Luxembourg

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Preface

I started the research described in this book with the attractive and inspiring idea of Artificial Companions that will be our helpers, our little artificial friends. They will know us and our preferences and serve us in many different tasks without having a specific purpose. They will interact with us for a prolonged period of time. They will entertain us and help us to manage our duties and leisure activities. And they will do all this using natural language and have a nice personality. It was April 2011 and I was a beginner PhD student at the University of Luxembourg.

But why should a person with a normal social life be interested in engaging in longer interactions with a machine instead of talking to their relatives, friends or neighbours? It was not difficult for me to find an answer to this question. I was born in the Soviet Union, and I grew up in Belarus. I started learning German as a second language when I was seven years old and continued learning and studying it after my school graduation. All the language teachers and university lecturers were non-native speakers of German. There was no possibility to practice German with native speakers in my home town, and it was not affordable for my family to go to Germany for vacations. With this background, it was quite an intuitive decision to create a machine that helps learners of a foreign language to practice conversation and behaves like a language expert in order to help learners like me that time.

In the very first discussions of these ideas with my thesis advisory board I was confronted with questions that further challenged not only my own understanding of what is given and what needs to be discovered, but also the views of other computer science persons on the board. What is *a natural language*? What is *a personality*? Who is *a language expert*? And who is *a human*? As Gudrun, the board member who asked me all these questions, put it: *there is no such animal as a bird. There is a parrot, there is a pigeon, there is a penguin, which in turn has a bit of a bird but also a bit of an animal. And it is not much different with humans*.

These questions were the reason I started learning and digging deeper and deeper into Conversation Analysis, where researchers believe that every tiny detail in talk between people plays a role and nothing is unimportant, asking *why that now?* Conversation Analysis became one of the most important tools that I had at hand to accomplish this work. Conversation Analysis inspired and shaped my approach to

dialogue research at that time, and it still plays a huge role in my view of understanding and modelling conversation.

From my perspective, a close collaboration between Conversation Analysis and Natural Language Processing would be beneficial for the two disciplines. While many books on Conversation Analysis and many books on Natural Language Processing and Dialogue Processing exist, it would be hard to find a book handling both, as they sometimes have contrasting and conflicting views on the rules of conversation and language in a broader sense. I hope that this book starts a movement bringing together researchers from the two worlds, Dialogue Processing and Conversation Analysis, in order to build better dialogue systems and, finally, better understand ourselves when we are talking.

Overview of the book

This book presents a novel approach to design of dialogue systems. Starting with the general idea of creating a machine that behaves like a language expert in conversations with non-native speakers, this book shows how Conversation Analysis can be included in the multidisciplinary research paradigm of Communicative Intelligent Computer-Assisted Language Learning (Communicative ICALL), sometimes also referred to as Dialogue-based ICALL. While many other books focus on implementation questions, this book concentrates on the detailed analysis of the specific type of dialogues that should be simulated with an artificial conversation partner. Therefore, a lot of space in this book is dedicated to intensive discussions of multiple examples, and only one chapter focuses on practical advice on a possible implementation.

This book is divided into three parts. Part I offers an introduction to the research area and provides a cross-disciplinary perspective on the research subject. Part II presents a detailed analysis of the dataset collected for this research and makes generalisations necessary for an operationalisation of the findings in a dialogue system. Part III explains how a possible implementation of the models introduced in Part II can be done. Because this research opened more new questions than it provided answers, several future research directions are outlined in Part III. Part IV contains supplementary material.

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I thank lecturers from the Masherov University Olga Sheverinova, Marina Zuy and Ludmila Galchenko who helped me to collect my data, which formed the basis of the whole research. I also thank the anonymous chat participants from Belarus, Germany and Luxembourg who spent hours chatting and, as I came to know later, found the chat pleasant most of the time.

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I thank Jean and Detlef Wotschke who helped me to discover myself as a researcher and to develop my passion to do research. I also thank Marie desJardins, my mentor at the AAAI doctoral consortium, in which I participated while I was expecting my first child. Marie gave me a few important pieces of advice about finding the right balance between my two identities – mother and researcher.

Last but not least, I thank my family: Winfried, Philipp, Sandra and Mom for their support during the time of doing this research and writing this book. I would never have even started writing this book without your encouragement and help.

October 2017 *Sviatlana Höhn*

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