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Hua Xu · Hanlei Zhang · Ting-En Lin

Intent Recognition for Human-Machine Interactions

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Preface

The natural interaction ability between human and machine mainly involves human-machine dialogue ability, multi-modal sentiment analysis ability, human-machine cooperation ability, and so on. In order to realize the efficient dialogue ability of intelligent computer, it is necessary to make the computer own strong user intention understanding ability in the process of human-computer interaction. This is one of the key technologies to realize efficient and intelligent human-computer dialogue.

Currently, the understanding of the objects to be analyzed requires different levels of ability such as recognition, cognition, and reasoning. The current research on human-computer interaction intention understanding is still focused on the level of recognition. The research and application of human-computer natural interaction intention recognition mainly includes the following levels: intention classification, unknown intention detection, and open intention discovery. Intention understanding for natural interaction is a comprehensive research field involving the integration of natural language processing, machine learning, algorithms, human-computer interaction, and other aspects. In recent years, our research team from State Key Laboratory of Intelligent Technology and Systems, Department of Computer Science and Technology, Tsinghua University has conducted a lot of pioneering research and applied work, which have been carried out in the field of intention understanding for natural interaction, especially in the field of intention classification, unknown intention detection and open intention discovery based on text information of human-machine dialogue based on deep learning models. Related achievements have also been published in the top academic international conferences in the field of artificial intelligence in recent years, such as *ACL, AAAI, ACM MM*, and well-known international journals, such as *Pattern Recognition* and *Knowledge-based Systems*. In order to systematically present the latest achievements in intention classification, unknown intention detection, and open intention discovery in academia in recent years, the relevant work achievements are systematically sorted out and presented to readers in the form of a complete systematic discussion.

Currently, the research on intention understanding in natural interaction develops quickly. The author's research team will timely sort out and summarize the latest achievements and share them with readers in the form of a series of books in the future. This book can not only be used as a professional textbook in the fields of natural interaction, intelligent question answering (customer service), natural language processing, human-computer interaction, etc., but also as an important reference book for the research and development of systems and products in intelligent robots, natural language processing, human-computer interaction, etc.

As the natural interaction is a new and rapidly developing research field, limited by the author's knowledge and cognitive scope, mistakes and shortcomings in the book are inevitable. We sincerely hope that you can give us valuable comments and suggestions for our book. Please contact xuhua@tsinghua.edu.cn or a third party in the open-source system platform https://thuiar.github.io/ to give us a message. All of the related source codes and datasets for this book have also been shared on the following websites https://github.com/thuiar/Books.

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