OpinionConv: A Framework for Simulating Opinionated Conversations for Sales Negotiation

Vahid Sadiri Javadi, Conversational AI and Social Analytics (CAISA) Lab, University of Bonn
Prof. Martin Potthast, Text Mining and Retrieval (TEMIR) Group, Leipzig University & ScaDS.AI
Prof. Lucie Flek, Conversational AI and Social Analytics (CAISA) Lab, University of Bonn

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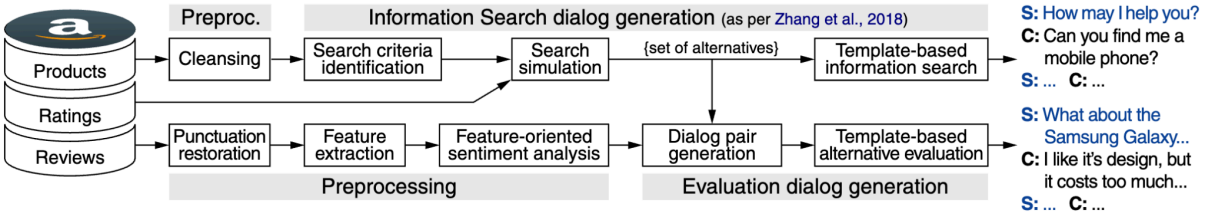
Abstract: When searching for products, the subjective experiences of others play a key role in making informed decisions. This is also true in sales negotiations, where a customer and a sales assistant exchange facts and opinions about products. However, training an AI agent for such conversations is complicated by the fact that: first, resources for training and evaluating a conversational agent that learns from customer experiences and communicates with users are not sufficient, second, language models do not possess authentic opinions for their lack of real-world experience. We address this problem by leveraging product reviews as a rich source of product opinions to ground conversational agents in true subjective narratives. With **OpinionConv**, we develop the first framework for simulating sales conversations in product search.

Motivation: In order to elucidate the mechanics of conversational product search, we simulate in-store dialogues between a customer and a sales assistant, where both parties incorporate grounded opinions, inspired by Kotler and Keller's five-stage process that encapsulates customer decision-making. In this work, our focus is on the third stage of the customer decision process. We conceive and operationalize the generation of grounded opinions by positing that a grounded opinion about a product is an opinion that has been verifiably expressed by a minimum of one individual in a product review that specifically discusses the product under scrutiny.

Methodology:



A high-level overview of our approach in OpinionConv for simulating opinionated sales negotiation.

Our approach is divided into two steps, the generation of pairs of talking points based on reviews of the alternative products, and their combination into a multi-turn conversation. For lack of public corpora of in-store conversations, we resort to a template-based approach, in which the templates are derived from common conversational negotiation strategies.

1. **Dialog Turn Pair Simulation**: In each turn of an evaluation dialog the customer and the sales assistant discuss the relative value of product features, as well as their benefits and shortcomings compared to alternative products. The most salient open question in this respect is: How should a sales assistant react to a customer's opinion in the context of a negotiation?
2. **Template-based Alternative Evaluation:** The last step of the OpinionConv framework simulates conversations composed of multiple dialog pairs, based on a negotiation strategy. Considering the diversity of real dialogs and the fact that a coherent conversation should have a smooth transition between turns, we define a diverse set of conversation templates inspired by past studies on negotiation in behavioral economics.

Research Enabled By OpinionConv: Our framework opens up a range of research opportunities in the field of opinionated sales negotiations. A key research task in conversational product search is generating fluent and informative natural responses while maintaining representative internal states in each dialogue utterance for product search optimization. Since OpinionConv has control over both the structure of the dialogue and the incorporation of subjective narratives into the conversation, it enables the researchers to conduct a detailed analysis of generation models from both customer and sales assistant perspectives, combining it with recent developments in RAG techniques.