

1 Research interests

My research interests encompass two key areas: **measuring user satisfaction** in goal-oriented dialogue systems and exploring the potential of **multi-modal** interactions. In the context of goal-oriented dialogue systems, I am particularly focused on evaluating and enhancing user satisfaction throughout the interaction process. Task-oriented dialogue systems play a vital role in facilitating efficient and effective task completion for users. However, assessing user satisfaction goes beyond simply measuring task success rates and accuracy. It involves capturing the user's subjective perception of satisfaction, which requires the development of comprehensive evaluation methodologies and metrics. I aim to investigate novel approaches for measuring user satisfaction in goal-oriented dialogue systems, addressing the limitations of existing evaluation techniques and proposing innovative strategies for improvement.

Additionally, I am intrigued by the possibilities offered by multi-modal dialogue systems. These systems leverage multiple modes of communication, such as speech, text, gestures, and visuals, to enhance the user experience and improve the overall quality of interactions. By incorporating different modalities, multi-modal dialogue systems have the potential to provide more natural and immersive conversations.

1.1 Evaluating user satisfaction in task-oriented dialogue agents

As the field of dialogue agents development continues to advance, it becomes crucial to evaluate their performance and measure user satisfaction. Traditional approaches to evaluating textual documents or tweets may not directly translate to dialogue agents due to the dynamic nature of dialogues and the contextual changes that occur over time (Yang et al., 2022). To ensure user engagement and coherence throughout the conversation, it is important to address the challenges of fulfillment of the user's needs. Additionally, incorporating paralinguistic cues, such as intonation and emotional recognition, can significantly impact the user experience and effectiveness of dialogue agents. I aim to explore different methodologies and ap-

proaches for evaluating dialogue agent user satisfaction, considering both subjective and objective measures. By understanding the factors that contribute to user satisfaction, we can enhance the development and deployment of dialogue agent systems to better meet user needs and expectations.

1.2 Multimodality in dialogue system

Additionally, my focus extends to the exciting domain of multi-modal dialogue systems, which offer a wide range of possibilities and advancements over traditional text-based solutions. Notably, my team and I have finished developing AMUseBot (Christop et al., 2023), a multi-modal dialogue system designed to assist users in the cooking process. AMUseBot boasts a rich multi-modal interface encompassing speech, text, and dynamic graphs that are presented during conversations. By incorporating multiple modes of communication, AMUseBot creates a more immersive and intuitive user experience, enabling users to interact naturally and obtain information efficiently.

One of the key advantages of multi-modal dialogue agents lies in their ability to leverage different modalities to convey information effectively. While text-based solutions have been predominant in dialogue systems, the inclusion of speech and visual elements adds a new dimension to the interaction, mimicking real-life conversations more closely. With AMUseBot, users can converse through speech, type text, and even receive visual representations of recipes and cooking instructions. This multi-modal approach enhances the system's ability to provide comprehensive assistance and accommodates users with varying preferences or accessibility needs.

Moreover, the architecture of AMUseBot combines both machine-learning and rule-based components, leveraging the strengths of each approach. The machine-learning components enable the system to learn from data and adapt to user preferences, while the rule-based components provide explicit control and enable domain-specific knowledge integration. This hybrid approach ensures the system's flexibility, adaptability, and accuracy in understanding user queries, offering tailored recommendations, and guiding users throughout the process.

2 Spoken dialogue system (SDS) research

- **Where do you think the field of dialogue research will be in 5 to 10 years?** I anticipate a greater emphasis on multi-modal dialogue systems. With advancements in technologies such as Computer Vision and gesture recognition, integrating visual and textual cues into dialogue interactions will provide richer and more immersive experiences. This opens up new possibilities for dialogue systems to understand and respond to not just spoken language but also visual and non-verbal communication, making the interactions more natural and intuitive.
- **What are the most important things for users of SDSs?** SDSs that exhibit context awareness are highly valued. Users expect SDSs to remember the context of the conversation, maintain continuity, and intelligently handle follow-up questions or references. Understanding and retaining contextual information enable SDSs to provide more personalized and relevant responses, enhancing user satisfaction.
- **Will SDSs be more widely used in the future? How? In what scenarios?** While multi-modal dialogue systems contribute to the wider usage of SDSs, their application extends beyond that. SDSs will find extensive use in customer service, healthcare, education, smart homes, and accessibility domains.
- **Is there a difference between SDS research in academia and industry?** Academic researchers delve into fundamental questions, such as dialogue management, state tracking, and user satisfaction metrics, conducting controlled experiments and developing benchmark datasets. In contrast, industry-focused SDS research prioritizes practical applications and real-world deployment, aiming to create commercially viable systems that address user needs and enhance experiences. Industry researchers focus on scalability, robustness, and reliability, optimizing system performance, integration, and engineering considerations.

3 Suggested topics for discussion

- Using multimodality in goal-oriented dialogue systems
- Development of robust evaluation metrics for dialogue systems that exhibit a high correlation with human user satisfaction.
- Personalization in dialog. Giving chatbots personas for higher user focus.

References

- Iwona Christop, Kacper Dudzic, and Mikołaj Krzyimiński. 2023. Amusebot: Towards making the most out of a task-oriented dialogue system. *Progress in Polish Artificial Intelligence Research 4, forthcoming*.
- Deng Yang, Zhang Wenxuan, Lam Wai, Cheng Hong, and Meng Helen. 2022. User satisfaction estimation with sequential dialogue act modeling in goal-oriented conversational systems. <https://aclanthology.org/2022.sigdial-1.59>.

Biographical sketch



Adrian Charkiewicz is a Computer Science with specialisation in Artificial Intelligence master student at Adam Mickiewicz University in Poznań. His master thesis is "Modeling user satisfaction in dialogue systems using natural language processing methods". He has experienced working with Natural Language Processing technologies for a company (Poleng) with a team of machine translation researchers.