**The Language of AI: Enhancing Human-Computer Interaction through Conversational Interfaces**

**STS 4500 Prospectus**

**School of Engineering and Applied Science**

**Bachelor of Science in Computer Science**

**The University of Virginia, Charlottesville**

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**Overview:**

The purpose of this research project is to investigate how the development of conversational interfaces powered by large language models (LLMs) will enhance human-computer interaction and reshape the way we communicate with technology. By focusing on the societal impact of this shift towards more natural and intuitive communication, the project aims to understand the potential benefits and challenges associated with the widespread adoption of conversational interfaces. Some key areas of exploration include the impact on productivity, and the emergence of new creative opportunities.

**Problematization:**

The primary stakeholders in this investigation are internet users and technology developers. The challenge lies in understanding the societal consequences of LLM-driven conversational interfaces and ensuring that their adoption is beneficial and equitable for all users.

**Guiding Question:**

How will the development and adoption of LLM-powered conversational interfaces impact human-computer interaction and the broader societal fabric?

**Projected Outcomes:**

The projected outcomes of this investigation are to identify the potential benefits and challenges of LLM-driven conversational interfaces and provide insights into how these

technologies can be designed and deployed to positively impact society. The study will explore the implications for productivity, creativity, and demographic-specific considerations, offering a comprehensive understanding of the societal impact of conversational interfaces.

**Technical Project Description:**

In my technical capstone project, I collaborated with a team of students to explore the impact of human-robot interaction (HRI) in social settings. Our project, "Simon Says with NAO: Investigating Enjoyment of Social Games with Robots," involved designing and conducting an experiment with 24 participants and one NAO robot. The participants were split into control and experimental groups, and their enjoyment levels were measured through post-experiment questionnaires.

This HRI project provided valuable insights into how humans perceive and engage with robots in social environments. We found that the presence of a robot in a social game like Simon Says could enhance enjoyment and lead to positive interactions between humans and robots. This experience provided me with a solid foundation for understanding the complexities and nuances of human-computer interaction, which serves as the basis for my STS project on LLM-powered conversational interfaces.

**Preliminary Literature Review & Findings:**

A growing body of literature has highlighted the potential benefits of LLM-powered conversational interfaces. For instance, Papenmeier et al. (2021) demonstrate that a chatbot-inspired search interface can lead to more engaging and personalized interactions. Hosseini-Asl, E., et. al. (2020) discuss simple language models (conversational AI) oriented for tasks in their paper which was written a few years prior to the emergence of LLMs, providing insight as to

how natural language interactions could have been simulated without the intelligence of the LLMs we have at our hands today. Their work can give context to the way conversational interfaces have been evolving and will continue to evolve with the emergence of new technologies.

**STS Project Proposal:**

The STS project will employ the Value Sensitive Design (VSD) framework to investigate the development and adoption of LLM-powered conversational interfaces and their impact on society. By examining the role of user needs, social groups, and various stakeholders in the design and adoption of these technologies, the project aims to offer valuable insights into their implications for human-computer interaction and societal dynamics.

The study will primarily rely on literature reviews and analysis of current use cases and developments, while also considering expert opinions to provide a comprehensive understanding of the societal impact of LLM-powered conversational interfaces. The project will analyze potential barriers to adoption and identify key demographic considerations, such as the impact on users with disabilities. Additionally, the research will explore the implications of LLM-driven conversational interfaces for transforming internet use into a conversational experience, increasing accessibility for the elderly and less technologically adept users, and the potential consequences of outsourcing cognitive tasks to LLMs.

By examining the literature and gathering data on user experiences and industry developments, the STS project aims to provide a comprehensive understanding of the societal impact of LLM-powered conversational interfaces. The project will maintain a user-centric focus

and consider the social implications of incorporating AI technology into human-computer interaction.

**Barriers & Boons:**

Limitations of the research include a limited timeframe for investigation, potential difficulties in accessing the latest industry developments, and the evolving nature of the LLM technology. To mitigate these limitations, the project will rely on interviews with experts in the field, leveraging the resources available at UVA, and staying up to date with the latest advancements in LLM research.

# References

Hosseini-Asl, E., McCann, B., Wu, C. S., Yavuz, S., & Socher, R. (2020). A simple language model for task-oriented dialogue. Advances in Neural Information Processing Systems, 33, 20179-20191.

Papenmeier, A., Kern, D., Hienert, D., Sliwa, A., Aker, A., & Fuhr, N. (2021). Starting Conversations with Search Engines - Interfaces that Elicit Natural Language Queries. Proceedings of the 2021 Conference on Human Information Interaction and Retrieval (CHIIR '21), 261-265. https://doi.org/10.1145/3406522.3446035