

Public Report

Overview

I had the opportunity to participate in an eight-week research internship at the Human Computer Integration Lab (HCILab) at the University of Chicago from July 1, 2024, to August 26, 2024. Under the supervision of Associate Professor Pedro Lopes and mentorship of PhD student Yudai Tanaka, I conducted research at the forefront of Human-Computer Interaction (HCI), focusing on the integration of Galvanic Vestibular Stimulation (GVS) and Virtual Reality (VR) to explore human perception.

Objectives

My primary objectives during this internship were:

- **Literature Survey:** Conduct an extensive review of existing research on GVS and VR within the context of HCI to establish a solid foundation for our study.
- **Experimental System Prototyping:** Develop and refine experimental systems that combine GVS and VR technologies.
- **Pilot and User Studies:** Design and execute pilot studies to test preliminary hypotheses, followed by comprehensive user studies with human participants.
- **Data Analysis and Paper Writing:** Analyze the collected data rigorously and contribute to writing a research paper aimed for submission to an international conference.

Activities

To achieve these objectives, we established a detailed roadmap with clear milestones and deliverables. The activities included:

- **Weeks 1-2:** Introduction to HCILab's research environment and initial pilot studies using existing GVS projects. Conducted literature surveys to familiarize myself with the domain.
- **Weeks 3-4:** Prototyped experimental systems by integrating GVS devices with VR platforms. Frequent discussions with my mentor helped refine the experimental setup.
- **Weeks 5-6:** Designed and conducted pilot studies to test and validate the experimental system. Began drafting the initial sections of the research paper, focusing on the introduction and related work.
- **Weeks 7-8:** Executed a comprehensive user study involving 16 participants. Analyzed the collected data and finalized the research paper's results and discussion sections. Created visual materials, including figures and videos, to support the findings.

Throughout the internship, I engaged in regular meetings and discussions with Pedro, Yudai and lab members, which were instrumental in shaping the research direction and resolving challenges promptly.

Results

- **Research Findings:** The user study revealed a significant difference between one of the GVS conditions and the control condition, supporting our research hypothesis about the impact of GVS on human perception within VR environments.
- **Paper Submission:** We are in the process of finalizing our research paper for submission to the ACM SIGCHI conference, a leading venue in the field of HCI.
- **Skill Development:** I gained hands-on experience in rapid prototyping, experimental design, data analysis, and academic writing. The mentorship provided by Yudai was invaluable in accelerating my learning curve.

Reflections

Participating in this internship was a transformative experience. The immersive research environment at HCILab taught me the importance of rapid prototyping and iterative design in advancing research efficiently. The culture of frequent feedback and open discussions significantly enhanced the quality of the research and my personal growth.

I also observed the strong emphasis on work-life balance among lab members, who managed to maintain high productivity during work hours while engaging in personal development and leisure activities outside the lab. This approach has inspired me to adopt similar practices in my future endeavors.

Conclusion

The internship at the University of Chicago's HCILab allowed me to contribute to cutting-edge research in HCI and expand my academic horizons. The supportive environment, combined with the research theme, has solidified my interest in pursuing advanced studies in this field. The hands-on experience in experimental design, user studies, and data analysis was invaluable. The collaborative and supportive environment fostered by my supervisor and mentor enabled me to navigate challenges effectively and develop practical research skills. This internship has reinforced my interest in pursuing further studies in HCI and applying what I've learned to future projects.

Acknowledgments

I would like to express my sincere gratitude to Associate Professor Pedro Lopes for his guidance and to PhD student Yudai Tanaka for his dedicated mentorship. Their support was crucial in the successful completion of this research project.