Statement of Purpose

I want to pursue an Informatics Ph.D. at Indiana University Bloomington with professor Patrick Shih in SoCo Lab. My overarching topic of interest is applying Human-Computer interaction(HCI) techniques to understand human implicit behaviors and interactions using the customized surveillance system. By inviting participants to use this system, I can provide new insights based on the data collected to encourage people to live healthier lifestyles, especially in this information-booming era.

My interest in HCI originates from my background in computer science and interactive media arts, where I made wearable devices enabling participants to interact with the environment. I used my technical side knowledge to build systems and design side background to create the novel responsive mechanism. My previous experience creating novel interactions makes me want to pursue an understanding of HCI on a system level. For example, one of my projects was called "interactive stairs," which are tractors that map users' activities into music. The inspiration was to motivate all students to use the stairs instead of the elevator. With such concepts in mind, we want to turn frustrating activities into fun, intriguing, and voluntary ones. The current existing facilities, such as piano stairs, didn't produce joyful music as they produced notes whatever passengers stepped on. However, according to music theory, the two adjacent notes are inharmonic. Since people usually take the steps one by one, the music generated is not joyful. With the data captured by the tractors, we can turn the users themselves' movement through covert post-processing of the data to make it the actual music. Coming with a background in Jazz, I designed an algorithm based on music theory and improvisation to convert steps to notes. Inventing such mixed-art and tech installations inspired me to consider the relationship between humans and these new technologies.

My research question is whether we can use and integrate technologies to support the health and well-being of human beings satisfactorily, which I will research during my Ph.D. in Bloomington. With that question in mind, I first make a hypothesis that constitutes different related factors. Whereupon, based on that hypothesis, I apply iterative prototyping and human-centered design to create the novel hybrid interface. Trained in both computer science and interactive media arts, I possess strong abilities in both the technical and design side. My interdisciplinary background enables me to envision the system from a novel

approach and to use technical skills to bring it to life. After all, I invite people to experience the system and extract their interactions. Evaluating their reaction within the system can therefore provide useful insight into factors that may facilitate people to pursue a better lifestyle.

I have participated in several research projects: one of my current roles is as a student researcher at the Far Lab at Cornell Tech, working closely with Dr. Wendy Ju and Dr. Sharon Yavo Ayalon's team on a Communal Extended reality bus project (submitted to CHI' 23), where I helped develop novel systems to analyze and study participants' reactions in a collaborative, real-time, geolocated in-bus VR environment. This project aims to evaluate whether this kind of immersive system can raise communities' awareness, knowledge, and resilience toward global warming. I designed & modeled the VR environment, programmed the system and its remote controller using the Unity Engine, and deployed it on 20 Oculus headsets. I also took the leading role in conducting formative studies with 80 people we recruited from nearby communities. The later goal of this project is to conduct quantitative research based on the video footage we collected from several experiments. We want to see to what degree we have changed participants' willingness to involve in environment-protecting activities before and after experiencing the system. This submission has just gone through the first round in CHI (48.1% acceptance rate at this time).

Professor Patrick Shih will be my ideal advisor because of his expertise in human-computer interaction and system design. Also, his background in data science and computer science will help me with system design and data analysis. I visited Dr. Shih's directed SoCo Lab in November, and I loved this lab's vibe and research topics. Besides the professor factor, I also enjoy the team-working environment at the SoCo lab at IUB, especially because everyone from the lab comes from different backgrounds. There will always be inspiration while working in the lab, but I can also help others create the system or tools to implement their creative thoughts. I think SoCo Lab and professor Patrick Shih will be my best choice.

My plan after completing the Ph.D. degree is to be a tenure-track assistant professor. In my past research experiences, I enjoyed the research process and got a substantial amount of help from my advisors. They provided detailed feedback and suggestions, which guided me toward my research goal based on their expertise and experience. Beholden to them, I have a chance to discover a specific topic and push the current boundary of our understanding of that topic. I genuinely want to pass these altruistic and generous spirits to more people. I would love to be a person that can help others and also fosters creativity through tech skills.