FIRST PLACE (tie)

Team Members: Bruna Damiana Heinsfeld (Interdisciplinary Learning and Teaching), Johanna Jacob (Computer Science), Natalijah Monahan (Clinical Mental Health Counseling)

Project Title: Addressing Ethical Conflicts in Telehealth Data Privacy Regulations

Abstract: The onset and the aftermath of the COVID-19 pandemic has seen a significant and rapid shift with mental health services in educational settings. The adverse impact of lockdowns, social isolations, pedagogical adaptations, and a decrease in community support has led to a 2-fold increase in the global prevalence of depression and anxiety in students. In response, professional organizations' virtual mental health services have seen remarkable utilization. However, numerous data privacy issues permeate this topic, including data collection, storage, management of session recordings, clarity and transparency on the consent terms signed by the users, and institutions that adopt these platforms. Considering this scenario, our project aims to raise awareness of existing conflicts related to data and privacy in online counseling services (or applications), advocate for transparency and visibility for end users (both for counselors and clients), and inform end users of how data storage, processing, and management is done within the application of the service provider. More specifically, we propose an awareness campaign to advocate for privacy rights and clarity on how sensitive user data is treated. To do so, we suggest the development of an online microsite to promote the campaign. The microsite would allow users to perform an in-depth analysis of privacy and security policies, understand ambiguous verbiage in those policies, detect exploitative practices among various telehealth providers and technologies and improve trust and awareness among telehealth consumers. Additionally, it would disseminate a digital stamp for allies and other advocates to use in their own awareness pieces, hashtags to be used on social media, such as #telehealthdataprivacy, and a page for signing a virtual petition in support of the review of online conferencing platforms' policies and terms of use to better accommodate telehealth needs. These actions would impact and benefit education, health, digital law, and cybersecurity fields.

FIRST PLACE (tie)

Team Members: Xiaoyun Liang (Civil Engineering), Shiyu Li (Translational Science), Alireza Ghavidel (Civil Engineering)

Project Title: Is the collaborative robot a friend or foe to construction workers? A behavioral perspective

Abstract: The construction industry has been suffering from safety issues over the years. The construction industry ranked first in fatal occupational injuries, which is striking considering its 12th place on the US GDP contribution list. Of note, Hispanic construction workers are disproportionally affected from fatal construction industries. In 2019, 374 Hispanic construction workers died at workplaces out of 1102 fatal worker injuries reported, surging nearly 90% since 2011. Given the higher proportion of Hispanic construction workers in Texas and in San Antonio, it is one of our priorities to address safety issues in the local construction industry.

Due to the development of advanced robotics, collaborative robots could be a promising solution to address these issues. Simple, task-oriented construction robots have been designed to lay bricks, drill holes, and deliver materials on construction sites to relieve construction workers from chronic occupational injuries such as back pain, tendonitis, bursitis, etc. However, most construction tasks are more dynamic and messier and require substantial collaboration and accommodation. Researchers perceive human-robot collaboration (HRC) as a solution to striking a balance between automation and flexibility. HRC creates a work environment where human workers can work hand in hand with collaborative robots and can share the same workspace, resources, and work on the same tasks. Several lines of research have been conducted to implement HRC to complete construction tasks, and the researchers have agreed on the promising future of implementing HRC on construction sites. On the other hand, unlike researchers, construction workers have limited knowledge of HRC and commonly express a sense of insecurity towards HRC. Different views on HRC result in an attitude conflict between researchers and employees, which could diminish workers' acceptance of HRC and further impede successful HRC implementation.

Therefore, to resolve this attitude conflict, we aim to integrate knowledge from different disciplinary backgrounds to extend the Technology Acceptance Model (TAM) for a better understanding of workers' attitudes, perceptions, and concerns towards HRC. This will be a transdisciplinary collaboration among three students from robotics, construction, and behavioral science. Robotics experts dedicate themselves to advancing the technical capabilities of robots for the construction industry; construction experts visualize which real-world tasks can and need to be achieved by HRC; and finally, behavioral experts help understand and explore approaches to improving workers' acceptance.

Results from this study will significantly benefit individuals, organizations, and society. HRC could allow construction workers to work in a safer environment. Moreover, it could cut excessive compensation payments and medical costs for construction companies. Ultimately, research indicates that integrating collaborative robots into construction sites might increase labor productivity by 22% and increase the overall value of the industry.

THIRD PLACE

Team Members: Charles Garcia (Neuroscience), Anthony Martinez (Psychology), Veena Prasad (Developmental and Regenerative Sciences)

Project Title: Reducing conflict in extreme and isolated environments by lowering aggression and increasing levels of well-being

Abstract: Antarctica is one of the most extreme climates in the world due to having average temperatures of -60 degrees °C. The continent is mostly uninhabitable, with people living there temporarily on rotation every year. The extreme climate and isolated environment of Antarctica can lead to increases in aggression and decreases in mental well-being. These changes in well-being can often lead to conflicts amongst researchers living within research facilities on the continent. Feelings of aggregation and isolation can disrupt research as individuals experiencing these negative states of mind are more susceptible to channeling their emotions in harmful ways towards fellow researchers. Here we attempt to determine if living in the tough conditions of Antarctica can result in increases of aggressive, isolated, and other negative states of wellbeing, by utilizing well-being assessments, electroencephalogram, and salivary hormone measurements. We then introduce various intervention treatments over a time period of 10 weeks to determine if the interventions are effective at restoring a positive well-being state. The intervention techniques included in this proposal include having participants caring for a potato plant, art therapy, virtual reality forest immersion, group activities, virtual reality group activities. By introducing treatments that have been shown in literature to reduce aggression, feelings of loneliness, and improve mental well-being, we expect that participants within each of these groups will have improved mental states with decreased levels of isolation and aggression. By improving the well-being of participants there would also be a reduction in the amount of interpersonal conflicts that arise in extreme and isolated environments.