Ph.D. Dissertation Defense

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Thursday, April 13 • 9 a.m. • Zoom

Talk Title: Toward a Longitudinal Program of In Situ Social Robotics Research and Informal STEAM Education

Abstract: Human-robot interaction (HRI) and its sub-fields of child-robot interaction (CRI) and social robotics are crucial to the development of robots that operate well in human oriented social spaces. In a series of studies, we developed a flexible program of research that would support a broad range of social robotics investigations while delivering science, technology, engineering, arts, and mathematics (STEAM) education content. In Study 1, we conducted acceptance research with college students utilizing 5 robots of humanoid, animalian, fantastical, and mechanistic forms to ascertain if robot appearance influenced people's preference for, interest in, and communication with robots. Results suggest that participants prefer robots that resemble animals or humans.

The study was repeated in Study 2 while only providing images of the robots and largely corroborated the initial findings. Study 3 was conducted investigating emotional voice acceptance and recognition with social robots. College students read fairy tales to robots that provided emotional comments on the stories to be evaluated. Emotion recognition accuracy and user acceptance were measured with nuanced results. With elementary students, we conducted a long-term study, Study 4, in an after-school program utilizing many of the same robots. In hour long weekly sessions over 9 weeks, small groups of 5 to 7 year old children played with the robots, constructed robot models, and produced two theater performances featuring themselves and robots. Interview results showed that the children also preferred humanoid and animalian robots. In a subsequent 8 week study, Study 5, we worked with approximately 25 children grades K-5 in the same after-school program.

Using the familiar "Beauty and the Beast" fairytale, acting, dancing, music, and drawing were explored with robots and coupled with relevant STEM concepts. Each theme was given a dedicated two-week module. The modular design coupled with a well-known story enabled children who could come to only a few sessions to participate actively. The children were enthusiastic and engaged with the program. Research interviews once again confirmed preference for humanoid and animalian robot forms. The progression of laboratory and in situ experiments presented allowed us to efficiently conduct social robotics research with multiple robots and create a longitudinal informal education program that both delivered STEAM educational content and provided a flexible platform for social robotics research in an everyday setting.

Scan the QR code to learn more and find the Zoom link.

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