

CS592: Socially Assistive Agents

Spring 2025

Instructor: Sooyeon Jeong (sooyeonj@purdue.edu)

Lecture: Mon, Wed, & Fri 11:30am-12:20pm @ LWSN 1106

Office Hours: Mon & Wed 12:30pm-1:30pm @ DSAI 3061

Instructional Modality: Face-to-Face

Course Credits: 3.0

Prerequisites: There are no prerequisites but backgrounds in human-computer interaction, applied AI/machine learning, or robotics are encouraged. Proficiency in some programming languages (e.g., Python) may be useful for completing the course project.

Course Description

Interactive AI agents (e.g., chatbots, virtual avatars, and robots) are making their way into our world and already many people interact with these agents in our everyday lives. For AI agents to perform various supportive tasks and harmoniously coexist with people in human environments (e.g., homes, schools, and hospitals), they need to be designed and developed to interface with people in natural and intuitive ways. The field of Human-AI Interaction is highly interdisciplinary, incorporating methods and techniques from human-computer/AI interaction, AI/machine learning, psychology, communication, cognitive science, and human-centered design. This course will introduce relevant areas for the development of social assistive agents, i.e., interactive AI agents that use social interactions to support and assist people. Students will read both classical and state-of-the-art research papers and lead discussion on theoretical basis and application contexts of socially assistive agents (SAA) and gain practical hands-on experience in the development process of SAAs. Over the course of the semester, the students will work in groups and will complete a course project that addresses an SAA-related research question of their choice.

Topics

- Types of interactive agents and their affordance
- Physical embodiment
- Agent morphology
- Motions and gestures
- Non-verbal interactions
- Proxemics and social navigation
- Turn-taking
- Human-centered design: User modeling and needfinding

- Understanding human mental states (Theory of mind)
- Learning from interactions
- Human-AI collaboration
- Emotion and affect
- Accessible design
- Error and repair
- Roles of interactive AI agents
- Explainable AI
- Ethics in Human-AI interaction
- Application areas (cognitive assistance, education, healthcare, etc.)
- Ethical design and social implications

Grading

- 30% Analytical reading responses
- 10% Discussion leadership
- 10% Project proposal
- 10% Project mid-report
- 20% Final project presentation
- 10% Final project report
- 10% Attendance and discussion participation