

CS 59200-MDH Modeling Digital & Real Humans

Semester: **Fall 2022**

Instructor: **Aniket Bera**

Schedule: **TTh 10:30a - 11:45a** Room: **HAMP 1113**

Email: **ab@cs.purdue.edu**

Prerequisites: *Knowledge of basic machine learning.*



Course Description

If we can simulate a virtual human that behaves and moves like a real human, then we have a working model of ourselves. This course instructs students on how to develop technologies that learn and model human behaviors, motion, and emotions. Topics include the data-driven modeling of 3D human motion, interaction along with cognition and perception; the communication of human emotion via face, voice, physiology, and behavior; designing of agents, and robots having skills of emotional intelligence. Weekly reading, discussion, and a term project are required. This course is approved for use on CS MS and PhD plans of study.

Planned topics of discussion:

- Emotionally Intelligent Human Computer Interaction
- Multi-Sensory Affect Recognition
- Emotion and Behavior Modeling
- Expression of Emotion by Social Robots or Virtual Agents
- Human Animation, AR/VR, and Metaverse applications

Format:

The class will be a mix of lectures and student presentations. Students will be mostly presenting and discussing research papers from top-tier ML/vision/graphics/robotics venues, followed by breakout discussions about the material. I will give some broad lectures on affective computing and behavior modeling. There will be guest lectures from professors in psychology and psychiatry about their models.

All students are expected to attend all classes and all project and proposal presentations. Absence from class, especially on project and proposal presentation days, will significantly affect your learning experience and grade.

Learning Outcomes

By the end of the semester, you should be able to:

1. Think about the “human aspect” in computing tasks
2. Be familiar with common affect and behavior methods in AI.
3. Know the style of academic writing in ML/Graphics/Robotics.
4. Know how to critically assess research papers in this area.
5. Formulate and carry out a research project.

Learning Resources, Technology & Texts

There is no required textbook for the course.

Grading

Reading (15%)

Paper presentation (25%)

Final project (55%)

Discussion participation (5%)

Contact

- Office hours
- Email (email must include the “CS59200-MDH” prefix in subject)

University policies: Accessibility

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let your instructor know so that you can discuss options.

You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247. (The weblink to the DRC is also available below.)

For accessibility concerns beyond this, the Office of Institutional Equity is responsible for ensuring Americans with Disability Act compliance, can be contacted with any accessibility concerns at:

Phone: (765) 494-7253

Email: equity@purdue.edu

TTY: (765) 496-1343

Website: <http://www.purdue.edu/ethics/oie/>

Emergency preparedness

- To report an emergency, call 911. To obtain updates regarding an ongoing emergency, sign up for Purdue Alert text messages, view: <http://www.purdue.edu/ea>.

- There are nearly 300 Emergency Telephones outdoors across campus and in parking garages that connect directly to the PUPD. If you feel threatened or need help, push the button and you will be connected immediately.
- If we hear a fire alarm during class we will immediately suspend class, evacuate the building, and proceed outdoors. Do not use the elevator.
- If we are notified during class of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in the basement.
- If we are notified during class of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, we will suspend class and shelter in the classroom, shutting the door and turning off the lights.
- Please review the Emergency Preparedness web site for additional information. http://www.purdue.edu/ehps/emergency_preparedness/index.html