

Syllabus

CS 181AI: Machine Learning System Design

Instructor: Arthi Padmanabhan

Spring 2023

Description. This course presents the steps and considerations for deploying machine learning models in real-world use cases. Students will become skilled at designing machine learning models and analyzing their model's tradeoff between performance and resource usage. They will also read and discuss relevant machine learning systems papers. Topics include creating a "good" dataset, designing a model, assessing your model's computational/memory/energy needs, when and how to use edge computing, and ways of lowering a model's resource usage.

Schedule. Classes start Jan 18 and end Apr 26. Lectures will take place Mondays and Wednesdays in person in SHAN 2460 from 9:35 – 10:50 (Section 1) and 11 – 12:15 (Section 2). The course includes a final project, which will be presented on Apr 24 and 26 (the last week of class) and with a final report due on May 5th.

Lectures. The primary way to learn the course material is through lectures. Lectures will start with a student-led discussion about a paper before moving on to the day's material. Lecture format will be interactive. Lecture slides will be available on the course website right before class, and the video will be posted after class.

Assignments. There will be 5 assignments total, all released and to be submitted through Gradescope. They will consist of working in Google Colab to develop and assess each part of the machine learning pipeline. Each student will have a total of 5 "life happens" late days to use with no penalty – after these are used, 10% will be deducted per late day. For extenuating circumstances, please come talk to me.

Discussion. A goal of this course is to interact with the material through discussions with your peers and me. This semester we will be using Slack for discussions. Please let me know if by the start of classes, you have not received an email invitation to the Slack CS181AI workspace.

Evaluation. This course contains 5 assignments, paper reading and discussion, and a final project. Assignments are worth 60% of your grade. The paper reading and discussion component is worth 13%. The final project consists of a proposal (5%), a presentation (10%), and a report (15%). The last 2% are for participation and can be earned by dropping by office hours some time before spring break.

Academic Honesty + Collaboration Policy. All students in this course agree to follow the [Harvey Mudd Honor Code](#). Students are strongly encouraged to discuss course material and assignments with each other. The best sources of information on using the tools and

frameworks for this course are online – please feel free to use online tutorials and resources. However, writing up the code and final answers to assignments should be done individually and should not be directly copy-pasted from any online code snippet. Please use your code comments to cite any sources you used.

Accessibility. HMC is committed to providing an inclusive learning environment and support for all students. Students with a disability (including mental health, chronic or temporary medical conditions) who may need accommodations in order to fully participate in this class are encouraged to contact the Office of Accessible Education at access@g.hmc.edu to request accommodations. Students from the other Claremont Colleges should contact their home college's Accessible Education officer.