

Artificial Intelligence & Society: Syllabus

STEM II Summer at Brown

Summer 2017

1 Course Overview

Welcome! In AI & Society, we'll explore the nature of Artificial Intelligence (AI) and how will it shape the world in the decades to come. Through hands on activities, discussion, and problem solving, we'll uncover the ideas that enable machines to see, use language, and reason, and investigate how these machines will affect the world. To develop your understanding of this interdisciplinary field, you and a partner will design, implement, and analyze a machine learning algorithm as your course project, in addition to participating in debates, reading and writing short stories, and tackling challenging technical problems. At the end of the course, you'll be well equipped to critically evaluate news and fiction related to AI, perceive problem solving, perception, and learning in a new light, and to continue applying your new technical skills to create projects that use machine learning, AI, and programming.

We will make heavy use of the course website, available here:

Course Website: <https://cs.brown.edu/~dabel/teaching/ais/ais.html>

We meet in J Walter Wilson (the tall building on Waterman across from the arch), Room 402.

1.1 Staff

Instructor: David Abel. (please call me Dave!)

Email: david_abel@brown.edu

Office: CIT 551.

Office Hours: Monday, Wednesday, Friday, 3pm-4pm.

Website: <https://cs.brown.edu/~dabel/>

Teaching Associate: Carl Trimbach.

Email: carl_trimbach@brown.edu

Office: CIT 303.

Office Hours: Tuesday, Thursday 3pm-4pm.

2 Units

The course is split into three units, which roughly correspond to the (1) past, (2) present, and (3) future of AI. A detailed schedule is available on the website.¹

2.1 Unit One: History and Background of AI (The Past)

We begin by diving into the history of AI. We'll visit instances of automatans in fiction throughout old religious and fictional texts, as well as the pivotal Dartmouth Summer Conference in 1956 that founded the field of AI.

Simultaneously we'll build your technical background in preparation for the project and tackling the core topics of AI in the next unit. These technical skills include Logic, Probability, Programming, and Binary Arithmetic.

We'll start programming with MIT's visual programming language, Scratch². As we transition to Unit Two, you'll switch over to Python, one of the most popular programming languages for Artificial Intelligence research.

2.2 Unit Two: AI Core (The Present)

Next we tackle the primary sub-disciplines within the field, including:

- Machine Learning
- Reinforcement Learning
- Robotics
- Computer Vision
- Natural Language Processing
- Search, Planning, & Heuristics

During this unit you'll get a chance to visit the Brown Robotics Lab and see what kind of work robotics researchers are doing at Brown. Additionally, you'll get to hear from several guest speakers that helped shape these fields.

2.3 Unit Three: AI & Society (The Future)

Our final unit tackles major issues facing scientists and politicians hoping to shape future generations of AI. The core question we investigate is this: *How will AI impact our world, and what can we do to make sure the impact is beneficial?*

We'll attend to this question from many perspectives, with a focus on the expected economic impacts. The course will culminate in a debate in which you and a small group will present a perspective defending one of many views of the future.

¹<https://cs.brown.edu/~dabel/teaching/ais/schedule.html>

²<https://scratch.mit.edu>

3 Expectations

You will see a lot of new material in this course, some of which will be unlike other topics you've come across before. Additionally, we're attending to challenging technical topics as well as complex social and philosophical issues, so please reach out to me if there are ways I can help improve your experience in the course. I'm happy to talk during office hours or over email.

There is no assigned textbook, though we will be reading throughout our two weeks. All readings, surveys, assignments, and relevant documents will be made available through the course website.

You will be regularly working with different partners throughout the course on programming labs and other activities – at least one laptop is needed per pair of students. If you did not bring a laptop, contact Dave on the first day of class and he will forward you to the CIS office that can rent a laptop to you.

All students are required to attend class every day including the last day of class.

My biggest expectation is that we all contribute a positive classroom environment. I expect everyone to participate during class and to be respectful of your peers. Ask questions, engage with your friends, pay attention to guest lecturers, and please don't use phones or other devices unless requested to do so.

3.1 Assessment

Your primary assessment will be through your work on the course project and your participation in class discussion and activities. You will receive a course performance report shortly after the course concludes, detailing your contributions to the course and any constructive comments (but no grade).

3.2 Academic Integrity

In your endeavor to understand course topics and complete the project, you are encouraged to seek help. Feel free to discuss course material with Dave and Carl, as well as your classmates, or to use the Internet as a resource. However, the aim of course project is to give you a unique hands on experience to explore the science and engineering behind AI. It is in part to demonstrate your understanding of the material; the work you submit must be your own, not copied or adapted from a friend or web page. Please cite any outside source you've consulted.

3.3 Disabilities

Brown University offers equal educational opportunities and reasonable accommodations for the needs of qualified students with disabilities. If anyone seeks a disability or learning accommodation, contact Dave and he will direct you to the Brown Student and Employee Accessibility Services (SEAS).