*“And because the upsides are so obvious, it’s particularly important to step back and ask ourselves, what are the possible downsides”* – Emily Bender

# Course Description

This course introduces students to both the technological and philosophical underpinnings of the current AI revolution. Throughout the year, students will be exposed to a variety of ML/AI techniques such as decision trees, evolutionary algorithms, and neural networks. Students will implement part or all of each of these techniques in python and then use the resulting programs to draw out interesting conclusions. Alongside each of these engineering tasks, students will also be exposed to readings that highlight various the break-throughs, false starts, and intellectual heritage of the quest to make a thinking machine.

The goal of this course is for students to emerge as capable engineers and as critical creators of technology. In terms of engineering, students will become schooled in best practices such as unit testing, git, and pair programming. In terms of critical thinking, students will be forced to explain how different philosophical ideas map onto different technical ideas and how they might be utilized in the future. Students will continually come back to questioning how to accomplish a particular task, what the costs and benefits of their decisions are, and what the hidden downstream effects of their decisions might be.

# Essential Questions

* How do I create an automated system that is usable, understandable, and safe?
* What are the essential properties of cognition and how do they relate to AI/ML systems?
* What are the strengths and weaknesses of the techniques underlying the AI/ML systems we interact with on a daily basis?
* How can we create systems that avoids our personal biases and the limits of our knowledge?
* How can data be used to produce a just outcome?

# Learning Objectives

* To learn common programming and engineering techniques.
* To utilize AI/ML to extract knowledge from data.
* To articulate the value of data in isolation and in aggregate.
* To understand how the notion of consciousness has evolved over time.
* To identify areas where AI/ML is given the power to make real-world decisions.
* To assess the decisions made by existing AI/ML systems and detect unjust outcomes.
* To develop confidence and a problem-solving mindset when dealing with new techniques.
* To engage with the material carefully and thoughtfully; to search for and analyze complex meaning.
* To lead and participate in class discussions and group activities with respect, interest, and enthusiasm; to use specific examples from texts and lessons as evidence for a particular view.

# Expectations

Generally, I expect you to be invested in this class and to be an active and positive member of our classroom community. In addition, I expect you to take your development seriously as a programmer, reader, and writer. The following are some specific guidelines that will help you to meet these expectations:

* Come to class prepared. This means you should have completed all of the assignments due for that day’s class, and you should have *annotated the text* of any assigned reading.
* Remain open-minded and sensitive during class discussions.
* Laptops, Cell Phones, Ipads, and other electronic devices are useful tools but also wonderful distractions. Your laptop should be charging for the class, but it should only be open when instructed. **Place your cell phones in your backpack. If you need to use it during course, quietly remove yourself from the hallway.**
* I expect each of you to make a solid, good-faith effort to do your best in this class (and I expect the same from myself). **I know, however, that this class is just one of many aspects of your life, so please talk to me if you need help doing your best work.**
* If you have questions or concerns, please ask me anytime. Also, please ask if you don’t know why we’re doing something or if you have a better idea.

In addition to the above expectations, you should complete all assignments and readings to the best of your abilities, setting and achieving high standards for your work. This desired work ethic includes demonstrating a willingness to seek guidance, to take suggestions with open-mindedness, and to act on the feedback received in revising assignments and preparing future work.

## **Email**

Generally, I do not check email between 7 pm and 7 am (the next school day); students who email me during these hours should not expect a response until after 7 am.

## **Reading check-ins**

To help students prepare for formative and summative assessments, occasionally, I will occasionally administer reading check-ins. These will be short, “quiz-like” assessments that gauge how students keep up with and understand the material. I will use either the focus or analysis standard to assess these quizzes. Low quiz scores may lead to a one-on-one meeting with me and/or communication with parents.