# Teacher Perspectives on How To Train Your Robot: A Middle School AI and Ethics Curriculum
## Appendix

In-Person Course Activities - Fall 2019

| Day 1 | Day 2 | Day 3 |
|---|---|---|
| **Welcome (15 mins)** Students are welcomed to the course and the stage is set for the type of activities they will engage in during the week | **Welcome (10 mins)** Students review what they learned yesterday and go over the activities for today. | **Welcome (15 mins)** Students review what they learned yesterday and go over ethical matrices and the activities for the day. |
| **What is AI? (30 mins)** Students discuss definitions of technology and artificial intelligence. Students play a game to | **Pizza Recipe Algorithm (10 mins)** Students create an algorithm to make a pizza. | **Ethical Matrices (30 mins)** Students learn about stakeholders and use ethical matrices to guide their moral reasoning about AI technology. |
| **Ethical Dilemmas (60 mins)** Students are introduced to moral reasoning with an ethical decision-making example. | **Pizza Delivery App (30 mins)** Students create an algorithm that determines the best type of pizza to create based on data input from several questions. | **Intro to Text Classification (60 Minutes)** Students explore how computers use word embeddings to make sense of language. |
| **Intro to AI Blocks (90 mins)** Students follow tutorials to refresh their knowledge of programming and get to know their robots. | **Intro to Image Classification (60 Minutes)** Students train an image classifier on several data sets of images. | **Command Recognition (90 mins)** Students use natural language processing to teach their robots to respond to voice commands. |
| **Reflect (30 mins)** Students reflect on what they have learned about AI and its role in society today. | **Algorithmic Bias Discussion (30 Minutes)** After watching and reading several sources students discuss the impact of biased algorithms on different groups of people. | **Final Project Research (30 mins)** Students conduct research and begin idea generation for their own robot projects. |
| | **Animal Recognition (60 mins)** Students use image recognition to have their robots recognize pictures of different animals. | **Reflect (30 mins)** Students set the criteria for the final project and reflect on their brainstorming to begin coming up with concrete ideas about what they will build with their robots. |
| | **Reflect (10 mins)** Students reflect on what they have learned today about algorithmic bias in AI systems today. | |

| Day 4 | Day 5 | Notes |
|---|---|---|
| **Welcome (15 mins)** Students create a list of tools to include in the "final project toolbox". | **Welcome (15 mins)** Students check in with each other about the work they need to do to finish their projects. | |
| **Final Project: Planning (30 mins)** Students choose a direction for their final project and begin planning what the major components of the project will be. | **Final Project: Finishing Up (120 mins)** Students put the final touches on their projects for the showcase. | |
| **Final Project: Work Time (105 mins)** Students start to build a first version of their final projects based on their plans. | **Final Project: Showcase Preparation (30 mins)** Students prepare to present the work they accomplished this week at the showcase. | |
| **Final Project: Peer Review (30 mins)** Students look at each others' projects to offer feedback | **Final Project: Showcase (60 mins)** Students present their robots to visitors. | |
| **Reflect (15 mins)** Students prepare a "final to-do list" for the next day's work. | **Reflect (15 mins)** Students reflect on the ethical and technical considerations that went into designing their robots, as well as their learning throughout the week. | |

Online Course Activities - Summer 2020

| Day 1 | Day 2 | Day 3 |
|---|---|---|
| **Welcome (15 mins)** Students are welcomed to the course and the stage is set for design decision making through a game of "Would You Rather?" | **Welcome (5 mins)** Students share any examples of AI they may have encountered the previous day. | **Welcome (5 mins)** Students share how image recognition could be used in their future projects. |
| **What is AI? (45 mins)** Students discuss definitions of technology and artificial intelligence. | **Pizza Delivery App (40 mins)** Students create an algorithm that determines the best type of pizza to create based on data input from several questions. | **Ethical Matrices (40 mins)** Students learn about stakeholders and use ethical matrices to guide their moral reasoning about AI technology. |
| **Ethical Dilemmas (30 mins)** Students are introduced to moral reasoning with an ethical decision-making example. | **Intro to Image Classification and Algorithmic Bias (45 Minutes)** Students train an image classifier on several data sets of images. After watching and reading several sources students discuss the impact of biased algorithms on different groups of people. | **Intro to Text Classification (45 Minutes)** Students explore how computers use word embeddings to make sense of language. |
| **Intro to AI Blocks (45 mins)** Students follow tutorials to refresh their knowledge of programming and get to know their robots. | **Animal Recognition (45 mins)** Students use image recognition to have their robots recognize pictures of different animals. | **Command Recognition (45 mins)** Students use natural language processing to teach their robots to respond to voice commands. |

| Day 4 | Day 5 | Notes |
|---|---|---|
| **Welcome (5 mins)** Students reflect on how text classification is used in their daily lives. | **Welcome (15 mins)** Students check in with each other about the work they need to do to finish their projects. | |
| **Final Project: Brainstorm & Planning (25 mins)** Students choose a direction for their final project and begin planning what the major components of the project will be. | **Final Project: Finishing Up (90 mins)** Students put the final touches on their projects for the showcase. | |
| **Final Project: Work Time (105 mins)** Students start to build the first version of their final projects. | **Final Project: Showcase (30 mins)** Students present their robots to visitors. | |