

UNIVERSITY OF MASSACHUSETTS – AMHERST
COLLEGE OF ENGINEERING FIRST YEAR SEMINAR – FALL 2020

Seminar Title	Artificial Intelligence: Opportunities and Responsibilities
Meeting Days/Time	Section 1: Tues, 4:00PM-4:50PM
	Section 2: Wed 2:30PM-3:20PM
Class Location	Zoom
Instructor Name	Aggrey Muhebwa
Email	amuhebwa@umass.edu
Drop-In Hours	Wed 3:30PM – 5:00PM

COURSE DESCRIPTION

Artificial Intelligence (AI) has been called the new age Gold.

From Silicon Valley to tech Makerspaces in Nairobi, AI is being lauded as a game changer for the world as we see it. Thanks to AI, there has been exceptional progress in medicine discovery, image processing, and natural language processing among others in the last 15 years. However, there's been a dark side of AI that is rarely talked about; algorithmic biases, surveillances, and misinformation among others.

In this seminar, we will explore what artificial intelligence is and what tools are needed to become an AI practitioner. Along the way, we will explore applications and short comings of AI in different fields and finally, build our own AI tool to solve a basic classification problem.

COURSE OBJECTIVES AND OUTCOMES

1. Explore applications of Artificial Intelligence applications in everyday life
2. Identify the moral and ethical responsibilities of scientists and engineers in developing AI tools that can harm or empower humanity
3. Develop information literacy and knowledge synthesis skills in researching and evaluating information, ideas and arguments.

COURSE REQUIREMENTS

This course has no prerequisites. However, to earn full credit, you are required to attend all classes and participate in all class related activities including discussions and in-class quizzes

CLASS MEETINGS & WORK SCHEDULE (TENTATIVE)

WEEK	DATE	TOPIC	Activities
1	S1: 08/25 S2: 08/26	Introduction to UMass Brief overview of the seminar	Icebreaker: Convince Skynet that you are an ally and not an enemy.
2	S1: 09/01 S2: 09/02	History of Artificial Intelligence	What is Artificial Intelligence(video) Breakout Discussion: What problem would you solve with AI?
3	S1: 09/08 S2: 09/09	AI practitioner's toolbox -Knowledge and skills required -Tools -Potential of AI	What does it take to become an AI practitioner(video) Breakout Discussion: What tools will need to build our system project Introduction: Building an AI system to classify Iris Flowers.
4	S1: 09/15 S2: 09/16	Algorithmic Bias	Algorithmic Bias and Fairness(video) Breakout discussion: What are some of the ways to reduce bias in AI. Project: Math needed for our project
5	S1: 09/22 S2: 09/23	Near Peer Lecture	
6	S1: 09/29 S2: 09/30	Crime/Surveillance	Potential of AI to solve crimes (video) Breakout discussion: How can we make the world safer with AI without misusing it. Project: Loading and exploring dataset
7	S1: 10/06 S2: 10/07	My first month at UMASS-Amherst	Open discussion Game (class votes the best dance): Create the best dance move using machine learning (link)
8	S1: 10/13 S2: 10/14	Climate Change	Using AI to tackle climate change (video) Project: Changing math equations into code and building the model
9	S1: 10/20 S2: 10/21	Intuitive AI (video)	Video Discussion Project: Training our model
10	S1: 10/27 S2: 10/28	Near Peer Lecture	
11	S1: 11/03 S2: 11/04	Healthcare	Can AI change the future of medicine? (video) Discussion Project: making predictions with a trained model.
12	S1: 11/10 S2: 11/11	Going Forward: Tips to improve productivity	Video Open discussion Game: Can your group create a hit in 2 minutes? (link)
13	S1: 11/17 S2: 11/18	Final Presentations (groups of 2)	Group presentations (2 people) - Topics to be discussed

*S1: Section 1, S2: Section 2

ATTENDANCE POLICY

Absentee Policy and Extenuating circumstances (illness, death in the family, etc.) for which students must miss a class meeting. While attendance is crucial to this course, extenuating circumstances may require you to miss a class meeting. Any absence must be approved by the instructor. Unexcused absences count towards your grades and will affect your final grade score.

PLAGIARISM POLICY

In all your writing, and in oral presentations too, it is essential that you acknowledge the ideas of others upon whom your own thinking depends, including ideas obtained from such non-written sources as lectures, interviews, class discussions, and even casual conversations with colleagues and friends. Give credit for ideas that are not your own as well as for passages of text that you summarize, paraphrase, or quote. If material possessions are the property of our community at large, thoughts and ideas—expressed in speech or writing—constitute the “intellectual property” of our academic community. To take another’s words or ideas and present them as your own is to commit plagiarism, an act of academic theft, and the punishments can be severe (cf. University of Massachusetts Amherst Academic Regulations, “Academic Honesty”).

ACADEMIC HONESTY

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty.

CIVILITY AND HARASSMENT

A major determinant of a successful educational experience is a shared sense of respect among and between the students and their instructor. Some of the content we will discuss may cause disagreements among members of the class. Multiple viewpoints are an essential component of any college course and disagreeing with someone is fine. However, rude, disrespectful, aggressive, offensive, harassing, or demeaning behavior—either face-to-face or in an online discussion—toward anyone in the class will not be tolerated. Students are expected to abide by the university Code of Student Conduct. Should a student feel someone has acted inappropriately toward them in class, please speak with the instructor at once so the situation can be addressed.

DIVERSITY AND INCLUSION

We are all members of an academic community with a shared responsibility to cultivate a climate where all individuals are valued and where both they and their ideas are treated with respect. The diversity of the participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your contribution is not being valued for any reason, please speak with the instructor privately. If you wish to communicate anonymously, you may do so in writing or speak with Dr. Paula Rees, Director of Engineering Diversity Programs (rees@umass.edu, 413.545.6324).

WELLBEING

We are living in even more unprecedented times due to the global pandemic that is Covid-19. Your well-being is my priority; my ask is that you keep an open line of communication with me so that I can help provide support for you in class.

GRADING CONTRIBUTION

In-class quizzes: 10%

Final Presentation – 20%

Participation - 40%

Attendance – 30%

Extra Marks

1. Co-Hosting - 10%

RECOMMENDED READINGS

1. Buchanan, B. G. (2005). A (Very) Brief History of Artificial Intelligence. AI Magazine, 26(4), 53. (<https://doi.org/10.1609/aimag.v26i4.1848>)
2. Ogbonnaya-Ogburu, Ihudiya Finda, et al. "Critical Race Theory for HCI." Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. 2020.
3. Rolnick, D., Donti, P. L., Kaack, L. H., Kochanski, K., Lacoste, A., Sankaran, K., ... & Luccioni, A. (2019). Tackling climate change with machine learning. *arXiv preprint arXiv:1906.05433*.
4. Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. *Stroke and vascular neurology*, 2(4), 230-243
5. <https://www.nytimes.com/2020/04/08/technology/ai-sports-athletes-machine-learning.htmlartificial>
6. <https://medium.com/vsinghbisen/how-ai-can-help-in-agriculture-five-applications-and-use-cases-f09c3dc326c9>

TALKS/MOVIES/PODCASTS

1. TED Talk: How I am fighting bias in Algorithms – Joy Boulamwini (https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms)
2. TV Show (5 seasons): Person of Interest – created by Jonathan Nolan, available on Netflix ([https://www.wikiwand.com/en/Person_of_Interest_\(TV_series\)](https://www.wikiwand.com/en/Person_of_Interest_(TV_series)))
3. AlphaGo- The movie. (<https://youtu.be/WXuK6gekU1Y>)
4. Deepmind: The podcast (<https://audioboom.com/channels/5002482>)