CMSC 116 - You and I, and Generative AI

Syllabus

Instructor

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Course Description

What would it take to ensure that generative artificial intelligence (AI) acts as a force for good, what does that mean, and is that even possible?

This course will explore whether and how generative AI can be developed to support human values and promote human autonomy, and how the context of the deployment of AI may impact answers to this question. Entire industries are being transformed by AI technology, much of which is driven by the recent meteoric advances in generative AI: the variety of AI that produces full content, such as documents, images, speech, and video. These advances have enabled many people to do things they previously were incapable of - such as essay writing or adding special effects to home movies - but have also brought about a series of ethical questions around their development and use - such as the role of AI in Hollywood brought into the public eye through the 2023 writer's strike. These developments raise fundamental questions around whether it is even possible to develop generative AI technology that empowers rather than replaces people, and which serves human values such as rights, justice, and dignity. It also raises the question: Is generative AI different from other technologies that can be used toward both positive and negative ends? Different disciplines have different ways of answering questions around human values, whether it's the social sciences, the humanities, or computer science. In this course, you will not only learn about the challenges of developing values-centered generative AI technology, but also actively participate in crafting tomorrow's solutions.

This course is open to all students, regardless of math, programming, or computer science experience, and programming will not be a necessary part of any assignment.

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This course is divided into three sections, each addressing a different aspect of the challenges of designing and developing generative AI that supports human values and promotes human autonomy:

1. Design - How do we design generative AI systems that support people, why is this hard, and how do we work with stakeholder communities?

2. Development - How do we build generative AI systems of text, images, audio, and video? How is data used and what impact does that have on what goes well and what goes badly?

3. Alignment - What do different fields of expertise have to say about aligning generative AI systems to human values? How do the humanities - those disciplines that study human society and culture - approach this problem, in comparison to social sciences - which study human behavior - in comparison

to computer science? What gaps exist in the development of generative AI that aligns with human values?

Disclosure: Parts of this syllabus were developed with the aid of ChatGPT, as will be many parts of the course itself (as well as other tools, like Claude, Bard, DALL-E, etc.). As with this syllabus, all interactions that led to the created content will be included as part of an appendix.

Learning Outcomes

After successfully completing this course you will be able to:

- Identify real-world contexts, drawn from your life experiences or your major, in which generative AI is or might be used, and the types of technology most likely relevant in those settings.

- Explain how generative AI decisions produce their output and distinguish the role that AI models, AI algorithms, and training data play in the development of generative AI systems, and how human values are reflected in those components.

- Organize the advantages and shortcomings of modern approaches to infusing human values into generative AI systems.

- Contrast the challenges of developing generative AI systems that align with human values against current governance approaches (e.g., proposals in the U.S. Senate, the MD Senate, and the EU AI Act).

- Judge the potential values misalignments around novel uses of generative AI.

- Use generative AI techniques that are appropriate for use in your own life and major, and develop the skills to evaluate and critique those tools.

Required Resources

- Course Website: elms.umd.edu

- Books (recommended):

  - The Alignment Problem: Machine Learning and Human Values. By Brian Christian. W. W. Norton & Company, 2021. $13.74
  - Artificial Intelligence: A Guide for Thinking Humans. By Melanie Mitchell. Farrar, Straus, and Giroux, 2019. $15.27
  - Human Compatible: Artificial Intelligence and the Problem of Control. By Stuart Russell. Viking, 2019. $13.61

- Other major resources:

  - Learn Prompting (learnprompting.org), an educational resource created and maintained by UMD undergraduate Sander Schulhoff. $0.
  - Generative AI for Beginners (github.com/microsoft/generative-ai-for-beginners), a second educational resource, created by Microsoft. $0.
  - Generative AI for everyone (https://www.deeplearning.ai/courses/generative-ai-for-everyone/). $0

- Total Estimated costs of required course materials: $0 – $42.62

Course Structure

This course meets in person, and students are expected to participate in person. There will be many in-class lab activities for which a laptop computer (or tablet on which you can type quickly) is highly recommended. Class will also often include breakout discussion sessions, in which students will collaborate in small groups to answer questions, solve problems, or explore generative AI solutions. Some of the course time will be "flipped lecture" in which students watch a video lecture ahead of time and discuss its implications in class, aided by in-class activities and debates. Some lectures (both in-person and flipped) will be augmented with presentations from AI experts in industry or the public sector, as well as guest lectures from faculty on campus, mostly from ARHU and BSOS.

Tips for Success in this Course

1. **Participate**. I invite you to engage deeply, ask questions, and talk about the course content with your classmates. You can learn a great deal from discussing ideas and perspectives with your peers and professor. Participation can also help you articulate your thoughts and develop critical thinking skills.

2. **Manage your time**. Students are often very busy, and I understand that you have obligations outside of this class. However, students do best when they plan adequate time that is devoted to course work. Block your schedule and set aside plenty of time to complete assignments including extra time to handle any technology related problems.

3. **Login regularly**. I recommend that you log in to ELMS-Canvas several times a week to view announcements, discussion posts and replies to your posts. You may need to log in multiple times a day when group submissions are due.

4. **Stay current**. This class moves at a quick pace and each week builds on the previous content. If you feel you are starting to fall behind, check in with the instructor as soon as possible so we can troubleshoot together. It will be hard to keep up with the course content if you fall behind in the pre-work or post-work.

5. **Use ELMS-Canvas notification settings**. Pro tip! Canvas ELMS-Canvas can ensure you receive timely notifications in your email or via text. Be sure to enable announcements to be sent instantly or daily.

6. **Ask for help if needed**. If you need help with ELMS-Canvas or other technology, IT Support. If you are struggling with a course concept, reach out to me and your classmates for support.

Policies and Resources for Undergraduate Courses

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity

- Student and instructor conduct

- Accessibility and accommodations

- Attendance and excused absences

- Grades and appeals

- Copyright and intellectual property

Please visit for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

Course Guidelines

Communication with Instructor:

Email: If you need to reach out and communicate with me, please contact me on ELMS. Please DO NOT email me with questions that are easily found in the syllabus, website or on ELMS (i.e. When is this assignment due? How much is it worth? etc.) but please DO reach out about personal, academic, and intellectual concerns/questions. While I will do my best to respond to emails within 24 hours, you will more likely receive email responses from me on Wednesday and Friday from 9:00am-12:00pm EST.

ELMS: The important deadlines will be on ELMS.

Piazza: I will send IMPORTANT announcements via Piazza messaging. You must make sure that your email & announcement notifications (including changes in assignments and/or due dates) are enabled in ELMS and for Piazza so you do not miss any messages. You are responsible for checking your email and Canvas/ELMS with regular frequency.

You are responsible for reading the class announcements that are posted on ELMS and Piazza. Please check them often (at least once a day). Important information about the course (e.g., deadlines, assignment updates, etc.) will be posted on these platforms.

Communication with Peers:

We will use discussion forums on Piazza to facilitate communication between students. Instructors are happy to answer logistical questions online (students should feel free to do so as well - this counts toward participation!). Generally we will not answer content questions online, but will instead address those questions that appear to indicate the most confusion in class. (Again, students should feel free to discuss!)

With a diversity of perspectives and experience, we may find ourselves in disagreement and/or debate with one another. As such, it is important that we agree to conduct ourselves in a professional manner and that we work together to foster and preserve a virtual classroom environment in which we can respectfully discuss and deliberate controversial questions. I encourage you to confidently exercise your right to free speech—bearing in mind, of course, that you will be expected to craft and defend arguments that support your position. Keep in mind, that free speech has its limit and this course is NOT the space for hate speech, harassment, and derogatory language. I will make every reasonable attempt to create an atmosphere in which each student feels comfortable voicing their argument without fear of being personally attacked, mocked, demeaned, or devalued.

Any behavior (including harassment, sexual harassment, and racially and/or culturally derogatory language) that threatens this atmosphere will not be tolerated. Please alert me immediately if you feel threatened, dismissed, or silenced at any point during our semester together and/or if your engagement in discussion has been in some way hindered by the learning environment.

Laptops in Class:

It's been documented that if you can, you are likely better off not using a laptop in class , except, obviously, when it's part of class. However, in some cases some sort of device for participating in in-class activities (tablet, laptop, phone) will be useful. You can make your own decision, but if your laptop use is distracting others, an instructor may ask you to cease using it (in particular, please avoid using websites with popup videos and the like). Please reach out to any instructor if we can help.

Major Assignments

Reading Reflections (10 x 2pts)

- Each week you will submit a reflection to readings for that week. These will be submitted online and will ultimately form a learning journal across the entire semester.

- To promote experiential learning, for some assignments students will complete the assignment without AI aid, for some with AI aid where they try to get the AI to help them as much as possible, and for some where they attempt to break the AI system.

- There are twelve reading reflections, of which you need to complete ten (completing more will garner you extra credit).

Quizzes (5 x 3pts)

- There will be roughly one quiz every other week, with the aim of ensuring that students are staying on track with the class and assessing their progress.

- Quizzes will be unannounced, for ten minutes, at the beginning of class periods. They are worth a very small percentage of students' grades, and are mostly for tracking educational outcomes.

Interview (15pts)

- Students will, individually, conduct a 20-30 minute interview of someone involved in or impacted by generative AI either in the real world or in another academic discipline (e.g., AI for journalism, history, art, as well as personal contacts like grandparents, pastors, friends, etc.).

- The students will use generative AI tools to process the interview and create a resulting "newspaper" article of 500 words, and a 5 minute presentation.

Team Project (20pts)

- Groups of 4-6 students will conduct a term project applying generative AI to a specific topic of interest, discussing relevant values from some formal perspective (ethics, sociology, humanities, etc.), and measuring mismatches between the behavior of that system and relevant values.

- Project outcomes will be four page research papers together with 15 minute presentations (and possibly demos) of the generative AI technology.

Exams (15pts + 15pts)

- There will be a midterm and a final exam, covering all topics in the course.

- Exam will be open-notes and open-book, but not open-computation.

All written materials that you hand in will be automatically checked for potential plagiarism, which constitutes an academic integrity violation (see policy below).

Grading Structure

Assignment	Percentage %
Reading Reflections	20
In-class Quizzes	15
Interview	15
Team Project	20
Midterm Exam	15
Final Exam	15
Total	100

Academic Integrity

For this course, some of your assignments will be collected via Turnitin on our course ELMS page. I have chosen to use this tool because it can help you improve your scholarly writing and help me verify the integrity of student work. For information about Turnitin, how it works, and the feedback reports you may have access to, visit Turnitin Originality Checker for Students.

The University's Code of Academic Integrity is designed to ensure that the principles of academic honesty and integrity are upheld. In accordance with this code, the University of Maryland does not tolerate academic dishonesty. Please ensure that you fully understand this code and its implications because all acts of academic dishonesty will be dealt with in accordance with the provisions of this code. All students are expected to adhere to this Code. It is your responsibility to read it and know what it says, so you can start your professional life on the right path. **As future professionals, your commitment to high ethical standards and honesty begins with your time at the University of Maryland**.

All work submitted must be your own; assignments solved through course assistance websites are not permissible under any circumstances. Material taken or copied from these sites can be deemed unauthorized material and a violation of academic integrity. These sites offer information that might be inaccurate or biased and most importantly, relying on restricted sources will hamper your learning process, particularly the critical thinking steps necessary for college-level assignments.

As part of this course, we will explore using AI generated content for homeworks and projects; the exact rules will vary assignment-by-assignment and will be specified there. For all assignments in which we use AI generated content, it is expected that complete interaction histories with the AI tool are included as part of the homework assignment, together with a reflection around its use. When in doubt, document. And never hand in any content that you would not stand by or could not defend.

dditionally, students may naturally choose to use online forums for course-wide discussions (e.g., Group lists or chats) to discuss concepts in the course. However, collaboration on graded assignments is strictly prohibited unless otherwise stated. Examples of prohibited collaboration include: asking classmates for answers on quizzes or exams, asking for access codes to clicker polls, etc. Please visit the Office of Undergraduate Studies' full list of campus-wide policies and reach out if you have questions.

If you ever feel pressured to comply with someone else's academic integrity violation, please reach out to me right away. Also, *if you are ever unclear* about acceptable levels of collaboration, *please ask*! To help you avoid unintentional violations, *the following table* lists levels of collaboration that are acceptable for each graded exercise. Each assignment will contain more specific information regarding acceptable levels of collaboration.

	'OPEN NOTES'	'USE BOOK'	ONLINE LEARNING	GATHER CONTENT WITH AI	ASK FRIENDS	WORK IN GROUPS
Homework	✓	✓	✓	varies	· · ·	· · ·
Quizzes & Weekly Summaries	✓	✓	✓	varies	· · ·	· · ·
Team Project	✓	✓	✓	✓	✓	✓
Final Exam	✓	✓	· · ·	· · ·	· · ·	· · ·

Grades

All assessment scores will be posted on the course ELMS page and Gradescope. If you would like to review any of your grades (including the exams), or have questions about how something was scored, please submit a regrade request on Gradescope to figure out a time to meet and discuss. I am happy to discuss any of your grades with you, and if I have made a mistake, we will regrade your entire assignment. We believe it is important that all students are graded equitably, and so while we'll correct misgrading errors, we cannot field requests for arbitrary grade changes or changes of thresholding.

Late work will not be accepted for course credit so please plan to have it submitted well before the scheduled deadline.

Final letter grades are assigned based on the percentage of total assessment points earned. To be fair to everyone I have to establish clear standards and apply them consistently, so please understand that being close to a cutoff is not the same as making the cut ($89.99 \neq 90.00$). It would be unethical to make exceptions for some and not others.

Final Grade Cutoffs									
+	97.00 %	+	87.00 %	+	77.00 %	+	67.00 %		
A	94.00 %	B	84.00 %	C	74.00 %	D	64.00 %	F	<60.00 %
-	90.00 %	-	80.00 %	-	70.00 %	-	60.00 %		

Accessibility and Disability Support

Any student eligible for and requesting reasonable academic accommodations due to a disability is requested to provide, to the instructor in office hours, a letter of accommodation from the Office of Disability Support Services (DSS) within the first two weeks of the semester.

Course Evaluations

The Department of Computer Science takes the student course evaluations very seriously. Evaluations will usually be open during the last few weeks of the course. Students can go to https://courseevalum.umd.edu/ to complete their evaluations.

Copyright

Acknowledgements

Thanks to Dr. Hal Daumé III for sharing his course materials.