Critical AI
ENGL 54.41
Distrib: TAS
24F

Instructor: James E. Dobson (email: James.E.Dobson@Dartmouth.EDU)
Website: https://english.dartmouth.edu/people/james-e-dobson
Office Hours: 7A Sanborn House: Wednesdays: 10:30 - 11:30am & Fridays: 9:30am - 10:30am (Canceled on October 11th and 18th)

COURSE DESCRIPTION: While the rapid improvement in generative AI over the past two years, especially as seen in interactive tools like OpenAI's ChatGPT and Google's Bard, caught many people by surprise, these technologies have a long history. The course takes up artificial intelligence as not a single technology or even a class of technologies, but rather a discourse concerned with the automation of perception (image, sound, text) originating in the mid-twentieth century. Critical AI examines the beliefs, theories, methods, and practices of machine learning as well as the social and cultural significance of these transformative technologies. Giving special attention to the intersection of humans and AI, we will examine the inputs and outputs of machine learning and the ethical issues related to training and using these tools. The large-scale AI projects of the present would not be possible without what critics have called digital dispossession and the extractive function of new forms of capital. In this course we will apply cultural critique to artificial intelligence while learning the fundamentals of how these technologies work and how they fail.

LEARNING OBJECTIVES:

1. Understand the historical development of machine learning and the role this history plays in the affordances of contemporary technologies.
2. Understand the major components of contemporary machine learning and generative AI applications.
3. Critique the use of cultural datasets in machine learning.
4. Describe social and cultural concerns related to recent machine learning developments in computer vision and text applications.
5. Describe how generative AI has changed accounts of creativity and authorship.
6. Work with others to develop a project making use of AI and produce a critique of these technologies.

ASSIGNMENTS AND ASSESSMENTS

- Participation (15%): Classroom participation is expected and required. On Tuesday classes, students will be expected to bring questions based on the week's readings. On Thursdays, students should bring questions for guest speakers. Participation and work with others is expected during those classes marked as labs.
- Take-Home Midterm (30%): The midterm will consist of short written responses and completed cells of a Jupyter notebook to construct and evaluate a machine learning model on a collection of images or text.

- Final Project (55%): A final (group or individual) project will make imaginative use of an open source fine-tuned large language model. Engaging with Critical AI scholarship, individual papers (ten pages) will provide critiques of the methods used in the project.

COURSE POLICIES

Academic Honor Principle: The faculty, administration, and students of Dartmouth College acknowledge the responsibility to maintain and perpetuate the principle of academic honor, and recognize that any instance of academic dishonesty is considered a violation of the Academic Honor Principle.

Religious Observances: Dartmouth has a deep commitment to support students' religious observances and diverse faith practices. Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me as soon as possible—before the end of the second week of the term at the latest—to discuss appropriate course adjustments.

Student Accessibility and Accommodations: Students requesting disability-related accommodations and services for this course are required to register with Student Accessibility Services (SAS; Apply for Services webpage; student.accessibility.services@dartmouth.edu; 1-603-646-9900) and to request that an accommodation email be sent to me in advance of the need for an accommodation. Then, students should schedule a follow-up meeting with me to determine relevant details such as what role SAS or its Testing Center may play in accommodation implementation. This process works best for everyone when completed as early in the quarter as possible. If students have questions about whether they are eligible for accommodations or have concerns about the implementation of their accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

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Mental Health and Wellness: The academic environment at Dartmouth is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including your undergraduate dean (http://www.dartmouth.edu/upperde), Counseling and Human Development (http://www.dartmouth.edu/chd), and the Student Wellness Center

(https://students.dartmouth.edu/wellness-center). I encourage you to use these resources to take care of yourself throughout the term, and to come speak to me if you experience any difficulties.

Office Hours and E-Mail: Please meet with me during my posted office hours or by appointment to discuss your work or any aspect of the course. As Canvas email might not be the most reliable method of communication, please use my Dartmouth email address. I will attempt to respond to all email in a timely fashion, although it may take up to twenty-four hours for me to respond.

Generative AI: We are going to be heavily using and critiquing various kinds of machine learning and artificial intelligence methods and applications in this class. You will be using these in and outside of class in order to probe and understand their operations. That said, when it comes to the essay that you will complete for the end of the course, I would like you to be the single, identifiable author of that document.

Research Data Services
Assistance with using computational resources and support for project design and implementation can be found through Dartmouth Library's Research Data Services team. You can contact members of this team via email: researchdatahelp@groups.dartmouth.edu and phone: 603-646-3845. https://www.library.dartmouth.edu/research-data-services

Weekly Schedule

The schedule may be subject to revision throughout the course of the term. Any changes will be announced in class and through Canvas/Email.

Week One: Introduction to Critical AI

Tues, September 17

- Rita Raley and Jennifer Rhee, "Critical AI: A Field in Formation," *American Literature* 95, no. 2 (2023): 185–204.
- Simon Lindgren, "AI Subjects," *Critical Theory of AI* (Hoboken, NJ: Polity, 2024).
- Joy Buolamwini, "The Defaults are not Neutral," *Umasking AI* (New York: Penguin 2023).

Thurs, September 19

- Dennis Yi Tenen, "The Emergence of American Formalism," *Modern Philology* 117, no. 2 (2019): 257–83.
- **Guest Speaker:** Dennis Yi Tenen

4:30pm Public Lecture: Dennis Yi Tenen, "The Myth of Creativity: Text Reuse in Contemporary Fiction," 4:30pm Wren Room, Sanborn House.

Week Two: The Perceptron and Computer Vision

Tues, September 24

- James E. Dobson, "Inventing Machine Learning with the Perceptron," *The Birth of Computer Vision* (Minneapolis: University of Minnesota Press, 2023).
- Frank Rosenblatt, "Design of an Intelligent Automaton" (Research Reviews: Office of Naval Research, October 1958).
- **Lab**

Thurs, September 26

- **Lab**

Week Three: Machine Learning Datasets

Tues, October 1

- Katherine Bode and Lauren M. E. Goodlad, "Data Worlds: An Introduction," *Critical AI* 1 October 2023.
- Catherine D'Ignazio and Lauren Klein, "Collect, Analyze, Imagine, Teach," *Data Feminism* (Cambridge: MIT Press, 2020).
- Emily Denton, et al., "On the Genealogy of Machine Learning Datasets: A Critical History of ImageNet," *Big Data & Society* 8, no. 2 (July 2021).
- Abeba Birhane, Vinay Uday Prabhu, and Emmanuel Kahembwe, "Multimodal Datasets: Misogyny, Pornography, and Malignant Stereotypes" (arXiv, October 5, 2021).

Thurs, October 3

- **Lab**

Week Four: Computer Vision and Modeling Perception

Tues, October 6

- James E. Dobson, "Confusing the Subject of Computer Vision," *Social Text* 41, no. 3 (2023): 35–55.
- Jill Walker Rettberg, "Being Seen: The Algorithmic Gaze," *Machine Vision: How Algorithms are Changing the Way We See the World* (Hoboken, NJ: Polity Press, 2023).
- Nicolas Malevé and Katrina Sluis, "The Photographic Pipeline of Machine Vision; or, Machine Vision's Latent Photographic Theory," *Critical AI* 1 (2023).

Thurs, October 10

- **NO CLASS**

Week Five: Neural Language Models and Word Embeddings

Tues, October 15

- Tomas Mikolov et al., "Distributed Representations of Words and Phrases and Their Compositionality," in *Advances in Neural Information Processing Systems* (2013): 3111–19.
- Melanie Mitchell, "Words and the Company They Keep," *Artificial Intelligence: A Guide for Thinking Humans* (New York: Picador, 2019).
- Tolga Bolukbasi et al., "Man Is to Computer Programmer as Woman Is to Homemaker? Debiasing Word Embeddings," *Adv. Neural Inf. Process. Syst.*, 2016, 4349–57.
- Michael Gavin, "The Computation of Meaning," *Literary Mathematics: Quantitative Theory for Textual Studies* (Stanford: Stanford University Press, 2023).

Thurs, October 17

- **NO CLASS**

Week Six: Pre-Trained Networks and Transformers and Take-Home Midterm

Tues, October 22

- Emily M. Bender et al., "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?," in *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency* (FAccT '21: 2021 ACM Conference on Fairness, Accountability, and Transparency, Virtual Event Canada: ACM, 2021), 610–23.
- OpenAI, "GPT-4 Technical Report." arXiv preprint, March 27, 2023.
- Minh Hua and Rita Raley, "How to Do Things with Deep Learning Code*," DHQ: Digital Humanities Quarterly* 17 (2023).
- N. Katherine Hayles, "Inside the Mind of an AI: Materiality and the Crisis of Representation," *New Literary History* 53, no. 4 (2022): 635-666.

Wed, October 23

- **Public Lecture:** Fabian Offert, "Are Nearest Neighbors Good Neighbors? Visual Similarity After Artificial Intelligence" (3:30 - 5:00pm, Haldeman 41)

Thurs, October 24

- Leonardo Impett and Fabian Offert. "There Is a Digital Art History." *Visual Resources* 38, no. 2 (April 3, 2022): 186–209.
- **Guest Speaker:** Fabian Offert

Week Seven: Modeling Language and/or Modeling Writing

Tues, October 29

- Roland Barthes, "The Death of the Author," *Image—Music—Text* (New York: Hill and Wang, 1977)
- Walter J. Ong, "Writing Restructures Consciousness," *Orality and Literacy* (Routledge, 2022).
- Paul Ricoeur, "What is a Text? Explanation and Understanding" *Hermeneutics and the Human Sciences: Essays on Language, Action and Interpretation.* (Cambridge: Cambridge University Press, 2016).

Wed, October 30th

- Public Lecture: Leif Weatherby, "The Poetics of AI," 12:00pm (lunch provided), Haldeman 41.

Thurs, October 31

- Leif Weatherby, "Artificial Intelligence and the Significance Crisis"
- **Guest Speaker:** Leif Weatherby

Week Eight: Genre and Generative AI

Tues, November 5

- Matthew Kirschenbaum, "Prepare for the Textpocalypse," *The Atlantic* March 8, 2023.
- Mark Coeckelbergh and David J. Gunkel, "ChatGPT: Deconstructing the Debate and Moving it Forward," *AI & Society* (2023).
- Long Ouyang, et. al., "Training Language Models to Follow Instructions with Human Feedback," (arXiv, 4 Mar 2022).

Thus: November 7

- Tyler Shoemaker, "Machines, Reading."
- **Guest Speaker:** Tyler Shoemaker

Week Nine: AI Applications and Fantasies (ChatGPT, Gemini, etc)

Tues, November 12

- Kent K. Chang et al., "Speak, Memory: An Archaeology of Books Known to ChatGPT/GPT-4" (arXiv, April 28, 2023).
- Michele Elam, "Poetry Will Not Optimize; or, What Is Literature to AI?," *American Literature* 95, no. 2 (June 1, 2023): 281–303
- Sébastien Bubeck, et. al., "Sparks of Artificial General Intelligence: Early Experiments with GPT-4" (arXiv, 13 Apr 2023).

Thurs, November 14

- Lab

Week Ten: Course Conclusion

Tues, November 19:

- Final Class