History of Science 284
Algorithms
Graduate Seminar
DRAFT SYLLABUS

Wednesdays, 3:00-5:00 (or thereabouts)

Prof. Alex Csiszar
Science Center 458 acsiszar@fas.harvard.edu
Office hours: By appointment

https://canvas.harvard.edu/courses/69507

This course situates the current explosion of interest in algorithms in culture by uncovering a much longer history of attempts to automate or otherwise simplify judgment, decision making, and attributions of trust and relevance. Rather than assuming that our current predicament is a direct result of recent technological advances, the course will stretch back to before the early modern period to consider recipes, through Enlightenment probability, and early conceptions of artificial intelligence. Taking our cue from current interest in the role algorithms play in issues of social justice, labor, discrimination, and ethics, we will look to see if we can trace a longer history of algorithms that is not simply a history of ideas but which places these issues at the center of the narrative. Note: Although the second half of the course will engage closely with new work in STS, it is possible to take this course to satisfy the Department of History of Science pre-1800 distribution requirement.

Course Requirements:

Regular seminar participation

Kickstarters, Responses, and Found Objects

Final Paper (~20pp.)

Informal symposium presentation of Final Paper/Project (to be scheduled for end of term)

Grading:

Participation (including Kickstarters, Responses, and Found Objects):	50%
Final paper (including symposium presentation):	50%

Required Books. (Some of these are available online via Harvard digital resources, and the rest can be easily found via several online stores.)

Elaine Leong, *Recipes and Everyday Knowledge: Medicine, Science, and the Household in Early Modern England* (Chicago, 2018).

William Deringer, *Calculated Values: Finance, Politics, and the Quantitative Age* (Cambridge, 2018).

Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton, 1988).

Matthew L. Jones, *Reckoning with Matter: Calculating Machines, Innovation, and Thinking about Thinking from Pascal to Babbage* (Chicago, 2016)

Ruha Benjamin, *Race after Technology: Abolitionist Tools for the New Jim Code* (Medford, 2019)

HOW OUR WEEKLY SEMINAR WILL WORK

Each week, each participant is either a Kickstarter, Hunter, or Responder.

Kickstarters
For each class, 1-2 students who will be required to draw up a robust (but not too extensive) list of discussion questions about our assigned readings. These questions must be pre-circulated to the entire seminar **by Monday evening (7pm)**. These questions should vary between the general and the specific. For example, you might ask us to compare two authors' arguments and you might ask us of what we think an author means in a specific sentence. You can connect the week's reading(s) to other readings we've done. Sometimes you might find yourself wanting to connect the readings to other texts that lie outside of this class.

During class, Kickstarters may help lead the seminar with me—we can consult on the best articles on which to focus during discussion and what order to proceed through the assigned material. I encourage the Kickstarters to make handouts for class: these could be passages you want to discuss in detail, analyses of themes we've encountered, etc.

Responders
Everyone else should write a short **response** to the Kickstarters' questions that should be **a minimum of 200 words**. All of these should be circulated to the entire seminar (including me) **the evening before** our meeting **(by 7pm)**. Responses can vary in approach: you might focus on a single question posed by the Kickstarters, or write shorter responses to multiple questions. You might also include your own discussion questions. Your responses will not be graded individually; they will be taken as evidence of your close engagement with the texts we're covering. I may draw on your responses to prompt individual students to contribute to discussion.

Hunters
One person will be assigned as **Hunter** for each session. The Hunter is responsible for bringing in **one or two objects** that relate to the discussion at hand beyond what is assigned on the syllabus. These could be any kind of media object or short (usually primary) text. (Film clips should be under 5 minutes.) You should be prepared to talk about your object or objects for five or so minutes and have a couple questions for us (you do not need to pre-circulate your object or your questions).

WE WILL WORK OUT THE PRECISE DETAILS OF HOW THIS WILL WORK ONCE WE KNOW HOW MANY OF US THERE WILL BE IN THE SEMINAR

Academic Integrity and Collaboration

Discussion and the exchange of ideas are essential to academic work. For assignments in this course, you are encouraged to consult with your classmates on the choice of paper topics and to share sources. You may find it useful to discuss your chosen topic with your peers, particularly if you are working on the same topic as a classmate. However, you should ensure that any written work you submit for evaluation is the result of your own research and writing and that it reflects your own approach to the topic. You must also adhere to standard citation practices in this discipline and properly cite any books, articles, websites, lectures, etc. that have helped you with your work. If you received any help with your writing (feedback on drafts, etc.), you must also acknowledge this assistance.

University Policies and Regulations

We uphold University policies and regulations on the observation of religious holidays, sexual harassment, racial or ethnic discrimination, and assistance available to students with disability issues. Any students requiring special accommodations should let the instructor know as soon as possible. We also uphold University policy with respect to cases of plagiarism. Students should make themselves familiar with the respective University regulations and are encouraged to bring any questions or concerns to the attention of the course instructors or section leaders.

Course Etiquette and Technology Policy

Please come to class with access to the readings, either via paper copies, or laptop, or tablet. (Not smart phones.) But note that there can be hazards to having access to one's laptop during class, since most of us (myself sometimes included) have a hard time avoiding checking email or doing other non-relevant things, such as shopping, following twitter feeds, planning parties, and so on. That is, there is to be no ambient computing. This is detrimental to a seminar like this and thus you absolutely should avoid doing it. If you know that you are prone to ambient computing then please bring the readings to class on paper – or disable your wireless connection.

SCHEDULE OF READINGS

This schedule is tentative and is subject to revision depending on the interests of the participants.

See "Further Readings" for each week on the Canvas website for other materials to each week.

Week 1 (1/29) Introductions

Week 2 (2/5). Some Definitions

Tarleton Gillespie, "Algorithm," in Benjamin Peters, ed., *Digital Keywords: A Vocabulary of Information Society and Culture* (Princeton, 2016).

Taina Bucher, *If . . . Then: Algorithmic Power and Politics* (Oxford, 2018), chapter 2: "The Multiplicity of Algorithms"

Ruha Benjamin, *Race after Technology: Abolitionist Tools for the New Jim Code* (Medford, 2019), Introduction.

Nick Seaver. "Algorithms as Culture." *Big Data and Society* (2017): 1-12.

Cathy O'Neil. *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (New York, 2016). Chapter 1.

Week 3 (2/12). Quantitative Ages

William Deringer, *Calculated Values: Finance, Politics, and the Quantitative Age* (Cambridge, 2018) [excerpts]

Jacqueline Wernimont, *Numbered Lives: Life and Death in Quantum Media* (Cambridge, Massachusetts: MIT Press, 2018), 1-49.

Week 4 (2/19) Instructions

Elaine Leong, *Recipes and Everyday Knowledge: Medicine, Science, and the Household in Early Modern England* (Chicago, 2018).

Week 5 (2/26). Reason

Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton, 1988).

Week 6 (3/5). Machines and Life

Matthew L. Jones, *Reckoning with Matter: Calculating Machines, Innovation, and Thinking about Thinking from Pascal to Babbage* (Chicago, 2016).

Jessica Riskin, *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick* (Chicago: University of Chicago Press, 2016) [excerpt]

Lorraine Daston, "Enlightenment Calculations," *Critical Inquiry* 21 (1994): 182–202.

Week 6 (3/12). Statistics and governance

Theodore Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton, 1995)

(See also Porter's first book, *The Rise of Statistical Thinking*.)

Alain Desrosières, *The Politics of Large Numbers: A History of Statistical Reasoning* (Cambridge, 1998)

Arunabh Ghosh, "Lies, Damned Lies, and (Bourgeois) Statistics: Ascertaining Social Fact in Midcentury China and the Soviet Union," *Osiris* 33 (2018): 149–168.

Background: Ian Hacking, *The Taming of Chance*.

Week 7 (3/26). Rules and Bureaucracy

Ben Kafka, *The Demon of Writing: Powers and Failures of Paperwork* (New York: Zone Books, 2012) [excerpt]

Jon Agar, *The Government Machine: A Revolutionary History of the Computer* (Cambridge, 2003) [excerpt].

Eden Medina, *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile* (Cambridge, 2011) [excerpt]

Possibly: David Graeber, *The Utopia of Rules: On Technology, Stupidity, and the Secret Joys of Bureaucracy* (2015)

Possibly: Ilana Feldman, *Governing Gaza: Bureaucracy, Authority, and the Work of Rule (1917-1967)* (2008)

Week 8. Valuing Life (4/2)

Dan Bouk, *How Our Days Became Numbered: Risk and the Rise of the Statistical Individual* (2015)

Khalil Muhammad, *The Condemnation of Blackness: Race, Crime, and the Making of Modern Urban America* (2010)

Colin Koopman, *How We Became Our Data: A Genealogy of the Informational Person* (Chicago, 2019).

Week 9 (4/9). The Very Idea

Ensmenger, Nathan. 2012. "Is Chess the Drosophila of Artificial Intelligence? A Social History of an Algorithm." *Social Studies of Science* 42(1): 5-30.

Stephanie Dick, [selection of essays]

Paul Erickson, Judy L. Klein, Lorraine Daston, Rebecca Lemov, Thomas Sturm, and Michael D. Gordin, *How Reason Almost Lost Its Mind: The Strange Career of Cold War Rationality* (Chicago, 2013) [excerpts]

Week 10 (4/16). Metrics and Governance

Sally Engle Merry, *The Seductions of Quantification: Measuring Human Rights, Gender Violence, and Sex Trafficking* (2016)

Marilyn Strathern, "`Improving Ratings': Audit in the British University System," *European Review* 5 (1997): 305–321.

Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (2015)

Week 11 (4/23). Patterns / Search

Wendy Hui Kyong Chun, "Queerying Homophily," in *Pattern Discrimination* (Minneapolis, 2018) [and perhaps other pieces in that volume]

Astrid Mager, "Search Engine Imaginary. Visions and Values in the Co-Production of Search Technology and Europe," *Social Studies of Science* 47 (2017): 240–262

Safiya Umoja Noble, *Algorithms of Oppression: How Search Engines Reinforce Racism* (New York, 2018) [excerpt]

Ruha Benjamin, *Race after Technology: Abolitionist Tools for the New Jim Code* (Medford, 2019) [excerpts]

Week 12 (4/30). Work

Karen E. C. Levy, "The Contexts of Control: Information, Power, and Truck-Driving Work," *The Information Society* 31 (2015): 160–174.

Ifeoma Ajunwa, "The Paradox of Automation as Anti-Bias Intervention," *Cardozo Law Review*, 2019.

Informal presentations to be scheduled

END

The precise schedule will be determined during the first week of class by participants. Some other possible weeks include:

INDUSTRIAL AUTOMATION

e.g. David Noble, *Forces of Production: A Social History of Industrial Automation* (1984)

FINANCE

e.g. Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (2015); work by Devin Kennedy; Karin Knorr Cetina, Donald McKenzie.

CASH

Finn Brunton, *Digital Cash: The Unknown History of the Anarchists, Utopians, and Technologists Who Created Cryptocurrency* (Princeton, 2019).