Equity and Discrimination in Computing Systems

Course Syllabus for CS 697 (*Equity and Discrimination in Computing Systems*), Spring 2020

Overview

Principles, techniques, and current research directions in fairness and accountability in computing systems. Ethical principles of algorithmic fairness, definitions of fairness, techniques for evaluating or providing fairness. Extensive readings of recent and historical papers both in computer science and in other disciplines informing research on adverse social effects of computing systems.

Course Logistics

Course Title	CS 697: Equity and Discrimination in Computing Systems
Credits	3
Schedule	Tu/Th 1:30–2:45 in CCP 368 (the conference room)
Readings	Research papers, articles, occasional book chapters

Instructor

Michael Ekstrand

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Phone	(208) 426-5761
Office Hours	Tu 10:30-11:30 am
	Tu/Th 3:00-4:00 pm

Textbook

Solon Barocas, Moritz Hardt, and Arvind Narayanan. 2019. *Fairness and Machine Learning*. Free e-book at https://fairmlbook.org/.

Additional readings as assigned.

GENERAL RUBRIC

If you successfully master the course materials, you will demonstrate the ability to do the following:

- Read and understand a paper and its contributions in the context of algorithmic fairness literature
- Identify the key claims and contributions of a research paper
- Participate in critical, constructive discussions of research, making insightful remarks substantiated with data and/or argument.
- Compare papers with each other, identifying contrasts and similarities and articulating how they connect with the research landscape
- Distinguish between the assumptions, claims, data, and implications
- Conceive of experiments, analyses, and research methods that will illuminate questions of interest
- Design, carry out, and report on a project that advances research

I will be assessing the various aspects of the class based on your demonstration of these skills, increasing my expectations as we progress through the semester.

COURSE STRUCTURE

You are responsible for the readings. Most classes we will discuss papers we have read.

Course Components and Assessment Plans

The work in this course falls into several categories:

- **Participation** in our class discussions.
- **Leading** paper discussions.
- **Assignments** to get hands-on experience with fairness literature.
- A **research project** to understand, communicate, and extend recent research in algorithmic fairness, equity, and discrimination.
- Midterm and final **exams (**with essay components).

Your final grade will be computed from these components as follows:

Category	%
Participation	10
Leading	15
Assignments	15
Project	40
Exams	20

The standard 70/80/90 scale determines the minimum grade you will receive (that is, if you have 80 total course points, you will receive at least a B-).

Readings, Participation, and Leading

For any class where we have a reading, I expect you to have read the paper and be prepared to discuss it. Our discussion may touch on any aspects of the paper, including its context, objectives, methods, findings, implications, limitations, and our own ideas for expanding or correcting the paper. By **noon on the day of class**, send me an e-mail about that day's reading with a 3-sentence summary of the reading's contributions plus one thing you learned from it.

Reading a paper is a skill that takes practice. We will discuss this some in class; I also recommend reading:

S. Keshav. 2007. How to Read a Paper. *SIGCOMM Comput. Commun. Rev.* 37, 3 (July 2007), 83–84. DOI 10.1145/1273445.1273458.

Michael Mitzenmacher. 2006. *How to Read a Research Paper*. https://www.eecs.harvard.edu/~michaelm/postscripts/ReadPaper.pdf

By the end of the semester, **you are responsible for two classes**, for which you need to select the reading (subject to my approval), prepare introductory remarks for the class about the paper, and lead the discussion. In your introductory remarks, say why you picked the paper, position it in its context, describe its goals and contributions, and give a few points to start the conversation. These remarks should take about 10 minutes, and you may use slides if you would find that helpful.

To lead the discussion, come prepared with questions to start the conversation and to restart it if it stalls. You are responsible for getting the discussion going, keeping it on track

if it veers into unproductive territory, and wrapping it up to ensure the group has take-aways from it.

Assignments

The first week of class, I will be giving a selection of assignments to give you hands-on practice with class concepts. You need to select two of these assignments to complete and submit before spring break.

Exams

There will be a midterm exam in February and a final at the end of the semester. Both exams will be take-home.

Research Project

The largest component of this class is the research project. You will select and propose an original research project, carry it out, and write up the results. I encourage you to discuss your ideas with me prior to the proposal deadline, so that you can get feedback on them and we can negotiate scope. There is admittedly some subjectivity in assessing research scope, but my intention is for research projects to have a scope that would be suitable for publication in the FATML workshop series or slightly (up to 20%) less.

The final deliverable for your class will be a 4-page (plus references) report in ACM Conference format and a presentation for the class. Throughout the semester, there will be opportunities to update the class on your project and get feedback from classmates on points that are giving you difficulties.

If you are also taking *Advanced Information Retrieval*, you may complete one project for both classes. You will still need to meet all requirements for both classes, including proposal approval by both Dr. Pera and myself, and the project will need to be larger in scope than it would be for only one of the classes, but not as large as two independent projects.

COURSE POLICIES

Attendance

You should attend all class sessions if possible. If you need to be absent for some reason, such as conference travel or illness, let me know as soon as possible. Unjustified absences may affect your participation grade.

Late Work

No late work is accepted.

Cheating and Academic Integrity

As both a researcher and a student, you are expected to do your own work, attribute sources, and respect the legal and moral rights of others with respect to their work; as a student, you are also required to abide by the university policies regarding academic integrity. While I aim to allow you to make reasonable use of resources, cheating (including copying code, using unauthorized resources during tests, etc.) will not be tolerated. If you are found to be cheating, the penalty may range from an F on the assignment to an F on the course, and will also be reported to the university.

Conduct

I expect you to behave in a civil, respectful manner in all class interactions, both in official meetings such as lectures and out-of-classroom activities such as project group meetings and study sessions, and to contribute to a constructive learning environment. The Recurse Center Social Rules are a good source of guidance on how to maintain a constructive and educational environment.

If you experience or witness harassment of any form, please let me know.

Disability Accommodations

If you need particular accommodations to be able to fully participate in this course, please talk with me as soon as possible. I may ask that you provide documentation from the Office of Disability Services, so if you have such documentation please bring it.

SCHEDULE

Jan. 13	Class Begins
Jan. 27-31	FAT*, no class (watch conference livestream)
Feb. 18	Midterm due (no class)
Mar. 1	Project proposals due
Mar. 20	Assignments due
Mar. 23-27	*Spring break*
Apr. 2	Ricardo Baeza-Yates seminar (mandatory, no class)
Apr. 27	Project presentations
May 5	Finals week – project report due Monday, final Wednesday

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