SYLLABUS

LAW AND POLICY OF BIG DATA, AI AND MACHINE LEARNING

Fall 2018

FH 326: Mon 2:10pm – 4:00pm and Thur 11:00am - 12:50pm

Course Description

This course, co-taught by a law professor and an artificial intelligence expert, will survey current legal and policy issues raised by "big data," data science, artificial intelligence and machine learning. We will consider issues such as: bias and discrimination in algorithmic decision-making, tort liability for harms caused by automated systems, regulation of the Internet of Things, government use of automated algorithms, the implications of trade secrecy in these contexts, and mechanisms for providing transparency and accountability. Note that this course is intended to complement the Information Privacy Law class and thus will not focus on privacy.

The course is designed primarily for law students but welcomes students from other disciplines who are interested in understanding the legal and policy issues associated with these technologies. No technical background or training is required or assumed; the course will provide a non-technical, conceptual overview of the relevant technologies as a foundation for studying the legal and policy issues. The course also does not assume knowledge of specific legal materials, which be introduced/reviewed as needed.

In this course, students will:

- Develop a non-technical, conceptual understanding of the technologies underlying big data, machine learning and artificial intelligence to support consideration of related policy issues
- Become conversant with the underlying policy concerns raised by these technologies and develop insights into how technological change shapes policy and legal doctrine.
- Gain substantive understanding of legal and technological aspects of the specific cases studied in the course
- Develop practical skills for policy analysis and framing of legal arguments through the case studies and associated assignments

Professor Contact Information and Office Hours

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Course Requirements

1. Class Materials and Preparation.

Mandatory Assignments: Assignments for each class are detailed on a separate Assignment Sheet posted on NYU Classes. There is no textbook for this course. Course materials are available either on NYU Classes or online. Class preparation sometimes includes notes, questions and/or brief ungraded writing assignments, which are detailed on the Assignment Sheet. All assignments (except materials denoted optional) are mandatory and must be completed prior to class or by any specific deadlines listed in the Assignment Sheet.

Optional Materials: Optional materials included on the Assignment Sheet are of various sorts: some serve as introductions/refreshers to basic legal concepts; some provide a more technical perspective; and others simply delve a bit more deeply into a topic. Use them as you see fit.

Updates: The Assignment Sheet will be updated as the semester progresses. We will notify you of updates by email at least 48 hours (usually more) before the relevant class or deadline.

2. Course Schedule and Case Study Approach.

The course is designed around eight case studies selected to illustrate the sorts of legal and policy questions raised by big data, machine learning and AI. Each case study will be the focus of three class sessions, generally organized into: 1) an introduction to a relevant factual and technological context, 2) a review of relevant legal basics and 3) an interactive discussion or exercise analyzing how the law does and should apply to the case. Preparation for application sessions often includes brief ungraded written assignments, detailed in the Assignment Sheet.

The planned schedule of topics is:

8/30, 9/5: Introduction: Technological Basics and Overview of Policy Concerns
9/6, 9/10, 9/13: Discriminatory Ad Targeting Case Study
9/17, 9/20, 9/24: Credit Scoring Case Study
9/27, 10/1, 10/4: AI-Assisted Medical Practice Case Study
10/8, 10/11, 10/15: Government Benefits Case Study
10/18, 10/22, 10/25: Criminal Law -- Trade Secret Forensic Evidence Case Study
10/29, 11/1, 11/5: Criminal Law -- Risk Assessment Case Study
11/8, 11/12, 11/15: Automated Contracting Case Study
11/19: IoT and Robotics: Direct Intervention in the Physical World
11/26, 11/29, 12/3: Autonomous Vehicles Case Study
12/6: Special Event Requirement. We anticipate cancelling the last class so that you can attend a portion of a relevant special event to be held at the law school on 12/5-6. We will provide further details when they are available.
3. Class Participation.

Class will be a combination of lecture, discussion and occasional in-class exercises. To receive any credit for class participation, you must attend class regularly, complete all ungraded written assignments and meet a minimum voluntary participation requirement.

**Voluntary participation requirement.** Rather than “calling on” students, we ask students to take the initiative to participate voluntarily in class discussions. To get any participation credit, each student must participate voluntarily in class discussion a minimum of **4 times during the first half of the semester and 4 times during the second half of the semester.** At the end of the semester, each student will complete an “affidavit of participation” attesting to the approximate number of times he or she participated voluntarily in class.

**Note to students who hate volunteering in class.** The minimum voluntary participation requirement is pedagogical and **you** are its intended beneficiary. We know that speaking up when you have questions or ideas to contribute is really difficult for some people. But it is a really important professional skill, especially for lawyers. Like other skills, it improves with practice and it’s much better to start practicing now than in a partner’s office or in court. If you are finding it hard to jump in before someone else volunteers, feel free to email us in advance of a particular class and we’ll keep a special eye out for your hand.

4. Grading.

Course grades will be based primarily on the final examination, with adjustments for class participation. The final exam will be a 4-hour open book in-class exam. More details about the final exam will be available near the end of the semester. Upward class participation adjustments will depend on both quality and quantity of participation. Downward class participation adjustments will be based only on whether you meet the basic requirements described above. In other words, you can hurt your grade by not speaking up, but not by asking “stupid” questions or giving “wrong” answers.
INTRODUCTION AND OVERVIEW

Th, Aug. 30:  Technological Basics

Required materials:
● Obama Administration White Paper, Preparing for the Future of Artificial Intelligence (October 2016), pp. 5-11
● Sanne Blauw, How to Defend Yourself Against Misleading Statistics in the News, (video)
● Matthew Salganik, Bit by Bit, Ch. 2.1-2.3
● Luis Serrano, A Friendly Introduction to Machine Learning, (stop at 20:00 “Support Vector Machines”)
● Luis Serrano, Machine Learning Testing and Error Metrics (stop at 33:00 “Model Complexity Graph”)

Optional materials:
1. Yufeng Guo, The Seven Steps of Machine Learning (video)
   ● Basic (and short) non-technical introduction to machine learning.
2. Ben Hammer, Machine Learning Gremlins (video)
   ● Common pitfalls in machine learning, somewhat technical.
3. Provost and Fawcett, Data Science and its Relationship to Big Data and Data-Driven Decision Making
   ● Excellent overview of the role of data science, especially in business applications.

Questions, notes and assignments:
1. How to read/watch the assigned materials. We’ve done our best to find introductory materials that are technical enough to give a foundation for diving into the policy issues, but not unnecessarily technical. But nothing is perfect! So if you run into some technical rough patches, don’t worry. You should read/watch those parts at a “skimming” level and bring any and all questions with you to class. Our job will be to help everyone understand the concepts that matter, at the level of detail that matters, for legal and policy analysis.
2. Assignment #1 to do after 8/30 class:
   ● Write a short paragraph describing application of big data, machine learning or AI from your personal experience or the media.
   ● By midnight, Aug. 31, post your description (with a link, if appropriate) to the Examples of Big Data, Machine Learning and AI Forum, under the Class Discussion tab on NYU Classes.
   ● Read two of your classmates’ posts before our 9/5 class
W, Sep. 5 (LEGISLATIVE MONDAY): Overview of Policy Issues

Required Materials:
1. Patrick Ball, The Bigness of Big Data, Parts II and V (pp. 3-6, 14-19) (posted)
2. Barocas et al, Fairness and Machine Learning, Introduction
3. Royal Society, Machine Learning: The Power and Promise of Computers that Learn by Example, Ch. 6, pp. 110-117

Optional Materials:
1. Arvind Narayanan, Tutorial: 21 Fairness Definitions and their Politics (video)
   • Discussing technical approaches to fairness
   • A mathematician’s critique of over-reliance on big data