NBER Economics of Digitization Tutorial Application

Contact Information

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Course of Study

PhD Candidate

Technological Innovation, Entrepreneurship and Strategic Management Group (TIES) at MIT Sloan

Years of enrollment: 2017 – 2022 (expected)

Dissertation Committee: Scott Stern (chair), Erik Brynjolfsson and Danielle Li

Major Coursework: Economics PhD sequences in Labor, Industrial Organization

Minor coursework: Computer Science PhD sequence in Machine Learning and Statistical Learning Theory

General Research Interests

I am interested in the incentives to adopt and develop prediction technologies and the economic consequences of their use. In one branch of work, I explore the impact of these technologies for workers and firms. In the second, I explore incentives to produce, adopt and diffuse this type of technology. As part of my research, I also use machine learning to answer some of these questions by, for instance, using text as data or building contextual bandit models to evaluate hiring potential. I hope to shed light on the implications of prediction technology for work, employment and market structures.

Current Projects

- **Management-Biased Technological Change (with Erik Brynjolfsson)**

  How will AI impact employment and workplace organization? We randomly allocate an AI tool, which provides real-time feedback and coaching, to call centers workers in sales and support roles. Using transcripts of the sales and support conversations, we show how the tool changes worker learning, human capital development and organizational capital. The reinforcement learning AI enables a persistent increase in skill of workers in both sales and support roles, shortens the learning curve for new hires and improves productivity by helping workers respond better to irate customers. Our results highlight

the potential for AI to play a management role in workplace organization and improve productivity of "soft skill" tasks.

- **Hiring as Exploration (with Danielle Li and Peter Bergman)**, NBER Working Paper 27736

  This paper views hiring as a contextual bandit problem: to find the best workers over time, firms must balance "exploitation" (selecting from groups with proven track records) with "exploration" (selecting from under-represented groups to learn about quality). Yet modern hiring algorithms, based on "supervised learning" approaches, are designed solely for exploitation. Instead, we build a resume screening algorithm that values exploration by evaluating candidates according to their statistical upside potential. Using data from professional services recruiting within a Fortune 500 firm, we show that this approach improves the quality (as measured by eventual hiring rates) of candidates selected for an interview, while also increasing demographic diversity, relative to the firm's existing practices. The same is not true for traditional supervised learning based algorithms, which improve hiring rates but select far fewer Black and Hispanic applicants. In an extension, we show that exploration-based algorithms are also able to learn more effectively about simulated changes in applicant hiring potential over time. Together, our results highlight the importance of incorporating exploration in developing decision-making algorithms that are potentially both more efficient and equitable.