NBER PhD Workshop on the Economics of Artificial Intelligence
Application

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EDUCATION

Massachusetts Institute of Technology **2016 – Present**
Sloan School of Management
PhD Candidate, Technological Innovation, Entrepreneurship, and Strategic Management
Key coursework: microeconomic theory, econometrics, labor economics

Wellesley College **2010 – 2014**
BA, Economics and English
Phi Beta Kappa, *magna cum laude*

EMPLOYMENT

National Bureau of Economic Research, Cambridge, MA **2015 – 2016**
Research Analyst for Pierre Azoulay at MIT

Analysis Group, Boston, MA **2014 – 2015**
Analyst

PUBLICATIONS & WORKING PROJECTS

"Innovation in Monopsonistic Markets" (with Danielle Li and Leila Agha)

"Retractions" (with Janet Freilich)

"Locked Out of the Ivory Tower? Antecedents and Consequences of Initial Career Choice for Elite Postdocs in the Life Sciences" (with Pierre Azoulay and Erin Scott)

"Daclatasvir + Sofosbuvir versus Standard of Care for Hepatitis C Genotype 3: A Matching-Adjusted Indirect Comparison." *Journal of Comparative Effectiveness Research*, 5(2): 129-139, 2016. (with Elyse Swallow, Jinlin Song, Yong Yuan, Anupama Kalsekar, Caroline Kelley, Fan Mu, Stephanie Noviello, and James Signorovitch)

TEACHING EXPERIENCE

MIT 15.399 Entrepreneurship Lab **2018 – 2020**
Teaching Assistant for Trish Cotter, Mercedes Delgado, and Julian Kolev

MIT 15.715 Entrepreneurial Strategy **Winter 2020**
Teaching Assistant for Scott Stern and Erin Scott

AWARDS & FELLOWSHIPS

Massachusetts Institute of Technology
MIT Presidential Fellowship (2016 – 2017)
MIT Sloan Doctoral Fellowship (2016 – Present)

Wellesley College
Natalie Bolton Faculty Prize, Economics Department (2013 & 2014)
Case Fellowship, Economics Department (2014)
Mary Ann Youngren Memorial Award in Critical Reading, 3rd Place, English Department (2013)

Soomi Kim (skim20@mit.edu)

A maximum 300-word summary of the applicant's interest in AI. This could include research already undertaken, links to current research that focuses on AI topics, or reasons for newly formed interest in the economics of AI.

I am interested in the economics of AI, particularly how AI can help innovators take "shortcuts" when producing ideas.

An important element of the production function of knowledge is that old ideas serve as inputs to new ideas. Because knowledge is cumulative, this leads to the burden of knowledge problem (Jones 2009): as knowledge accumulates, it becomes increasingly harder for new generation of researchers to learn the accumulated knowledge and push the frontier.

However, by changing the relationship between old and new ideas in knowledge production, computers can lead to shortcuts that reduce the burden of knowledge:

- Shortcuts that overcome the burden of knowledge: these shortcuts speed up the process of learning past knowledge. For instance, consider Stata. Instead of spending the time to study econometrics before running regressions, we can simply access that knowledge embedded in Stata to run regressions.

- Shortcuts that sidestep the burden of knowledge: these shortcuts help us avoid having to learn past knowledge altogether in order to innovate. AI can play an important role. For example, Google's DeepMind team recently outperformed teams of chemists on a protein folding problem contest using neural networks, even though Google's team was less knowledgeable in chemistry. This illustrates how prediction technologies that emphasize correlations can bypass the need to understand causality. Outsiders with prediction technologies can potentially beat insiders on their own turf, despite having little knowledge.

These shortcuts highlight how computers can increase productivity. Yet, reliance on computers can also lead to the "black box", where we may not understand how the technology arrived at a solution (e.g., undergrads blindly using Stata or engineers struggling to discover why a machine learning algorithm outputted a result). I would love to learn more about AI and use AI as a lens to explore the consequences of taking shortcuts to innovation.