Lingwei Cheng

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Education

Carnegie Mellon University, Heinz School of Information System and Public Policy Sept 2019 - Current
Ph.D. Candidate in Machine Learning and Public Policy
Research Interest: social and economic impact of algorithm · strategic behaviors in presence of algorithm · algorithmic fairness

The University of Chicago, Harris School of Public Policy Jun 2016
M.S., Computational Analysis and Public Policy

Dickinson College May 2014
B.A., Political Science and International Business & Management, Phi Beta Kappa

Professional Experience

The University of Chicago Booth School of Business, *Adjunct Assistant Professor in Operations Science* Sept – Dec 2017
- Taught Data Analysis with Python to MBA students covering web scraping, data manipulation, ML pipeline, and visualization.

Poverty Lab at Urban Labs at The University of Chicago, *Data Analyst*, Chicago, IL Aug 2016 – May 2019
- Researched on urban homelessness and workforce development using causal inference and predictive analysis methods.
- Prepared policy memos, report and presentations for policymakers, academic researchers, and other stakeholders.
- Organized internal workshops on data science among data analysts, research managers, and project associates.

Public Policy Research Experience

Homelessness Projects at Urban Labs, *Data Analyst,* Chicago, IL Aug 2016 – May 2019
- **Ending Family Homelessness Initiative**: Combined Chicago Public School and Homeless Management Information System data to study family homelessness. The work was awarded Les Brown Award for Excellence in Public Policy Work by Chicago Coalition for the Homeless for contributing to the broader recognition of doubled-up as a common pathway into staying in shelters.

- **Predict Homelessness in County of Los Angles**: Prototyped a predictive model using administrative records across six departments to demonstrate the predictability of returning to homelessness in the government contract bidding process. The prototype contributed to the wining of the contract to work with the county. Collaborated with UCLA's California Policy Lab on building a predictive model to predict first-time and returned homelessness.

Workforce Development Projects at Urban Labs, *Data Analyst,* Chicago, IL Aug 2016 – May 2019
- **One Goal**: Built a predictive model for college persistence using data from the mentoring program, National Student Clearinghouse, and other relevant administrative records.

- **Social Belonging RCT:** Conducted RCT analysis with data from first year trial to study the effect of social intervention in form of video messages on fostering sense of belonging and on students' academic performance.

North American Basic Income Guarantee Congress, *Panelist*, NY, NY June 18, 2017
- Presented Basic Income in Multi-Cultural Contexts at the Cultural and Conversational Contexts of Basic Income Session.

Coursework and Skills

PhD Coursework: **Econ:** Econometrics I, II. Microeconomics. Behavioral Economics, Structural Modeling; **Stats:** Intermediate Statistics, Multivariate Data Analysis; **ML:** Introduction to Machine Learning. Deep Reinforcement Learning, Human and Algorithmic Bias Seminar.
Programming: Proficient: Python, R, SQL, JavaScript, HDFS, AWS, Google Cloud

Research Interest Statement

Prior to the PhD program in my capacity as a data analyst at UChicago Urban Labs, I was involved with several data science projects predicting homelessness in Los Angeles County (report) and post-secondary education outcomes in Chicago. Too often have I found myself in difficult positions discussing tradeoffs and fairness with partners for whom the algorithm performance metrics made little sense without concrete socio-economic contexts and usage guidelines.

The overarching goal of my research is thus to ground the evaluation of algorithms in their real-world impact rather than theoretical potentials, and to understand how algorithms dynamically interact with the environment and human incentives. More specifically, my current research interest lies in social and economic impact of algorithms, strategic behaviors of stakeholders in presence of algorithms, and algorithmic fairness in social policies. As someone with more background in machine learning, the more I dive into these questions, the more I found economics fields particularly welfare economics, decision theory, and game theory useful for understanding the new challenges. For this reason, I found NBER's workshop on the Economics of Artificial Intelligence a great opportunity for me to further my study and network with other young scholars in the field.

Using child maltreatment call screening data from Pittsburgh, my current project attempts to infer caseworkers' objectives from past administrative data and understand how their decision-making process change overtime in presence of the algorithm. I explore the heterogeneity in algorithm adoption based on characteristics of the caseworkers. Through this research, I hope to contribute to a more decomposed view of bias that can arise not only from the prediction itself but also through preferences of the decision-makers. Given the realistic concerns of high turn-over in social services workforce, this will provide some evidence and a framework for considering the short-term and long-term effects of using algorithm on the operations of the government agency as well as social welfare.