TERENCE CHAU

EDUCATION

Ph.D. Public Policy, University of Chicago   August 2023
Dissertation Topics: Economics of Innovation, Technological Change, Economic History
Relevant Coursework: Labor Economics (specialization), Econometrics & Statistics (specialization), Machine Learning, Industrial Organization

Bachelor of Economics, Universidad de Costa Rica   2016

SKILLS

Programming   R, Python, GIS, SQL, Apache Spark (Scala), AWS S3, AWS SageMaker, Git, Stata
Areas of Expertise   Causal Inference, Machine Learning, Causal ML

WORK EXPERIENCE

Research Director   August 2023 - Present
University of Chicago Crime Lab and Education Lab   *Chicago, IL*

- Lead and provide scientific direction to complex, policy relevant research projects related to personalized learning and public safety involving 30+ direct contributors.
- Design randomization plans, power calculations, and pre-analysis plans for various projects, including one of the largest A/B tests in economics ($N \approx 30,000$).
- Direct analysis of experiments and quasiexperiments using cutting edge statistical methods including multidimensional regression discontinuity and randomization inference for non-standard estimators.
- Oversee implementation of methods combining machine learning and causal inference such as personalized treatment effect estimation and augmented inverse propensity weighting.
- Work cross-functionally with teams including data science, policy implementation, public affairs, and fundraising.
- Write research articles, grant proposals, and other forms of research communication.
- Communicate research insights to a diverse range of technical and non-technical audiences, ranging from school district staff to foreign government officials.
- Maintain academic and research partnerships with other organizations (MDRC, Innovations for Poverty Action)
- Secured $350,000 in project funding.

Economist Intern Core AI   June 2022 - September 2022
Amazon.com   *Seattle, WA*

- Received full-time return offer.
- Owned project measuring causal effects of $300 million labor safety program using large-scale data analysis and econometrics methods such as instrumental variables and survival models in Spark ($N \approx 380,000,000$).
- Built strong relationships and lines of communication with engineers, other scientists, and workforce domain experts to refine research design.
- Effectively communicated complex insights to organizational leadership, which led to approval of a follow-up nationwide labor force experiment.

Doctoral Researcher   June 2018 - August 2023
Harris School of Public Policy, University of Chicago   *Chicago, IL*

- Dissertation: Essays on the Economics of Innovation
  - Quantified the causal impact of NASA's creation on innovation using patent data and difference in differences models. Showed spaceflight patenting increased 59.9% post-NASA, impact of these fields increased by 72.3%, and impact extended to non-spaceflight fields.
  - Used machine learning to link patents to all 1850-1880 US manufacturing businesses using novel data sources.

- Other projects:
  - Built novel comprehensive US business dataset observing all manufacturing firms between 1850-1880 by linking historical censuses using machine learning.
  - Calculated and mapped river-level waterpower across entire US using high resolution hydrography and elevation GIS data to study waterpowered firm location choice in the 19th century.
  - Carried out natural language processing on Congressional Record speeches to measure politician attitudes towards migrants around the 1892 Chinese Exclusion Act and its repeal in 1943.
  - Showed police protocols in Manchester, UK that predict domestic abuse risk perform similarly to a random guess. Developed asymmetric cost random forest classifier that increased predictive power by 27.2%.
  - Estimated the causal effect of German geographic dialect on wages using historical dialect speech tags and LASSO instrumental variables models. Discovered and submitted coding error in official IV-LASSO R library.

Graduate Instructor & Head Teaching Assistant　　　　　　　　　　　　June 2018 - December 2021
Harris School of Public Policy, University of Chicago　　　　　　　　　　　　　　　　*Chicago, IL*

- Taught data manipulation, data visualization, and program evaluation in R and Stata to up to 329 students.

REFERENCES

- (Ph.D. Co-Chair) Dr. Jeffrey Grogger, Irving Harris Professor in Urban Policy, Harris School of Public Policy, University of Chicago (jgrogger@uchicago.edu)
- (Ph.D. Co-Chair) Dr. Richard Hornbeck, V. Duane Rath Professor of Economics and Neubauer Family Faculty Fellow, Booth School of Business, University of Chicago (richard.hornbeck@chicagobooth.edu)
- Dr. Anders Humlum, Assistant Professor of Economics and Fujimori/Mou Faculty Scholar, Booth School of Business, University of Chicago (anders.humlum@chicagobooth.edu)
- Dr. Vikram Pathania, Principal Economist, Amazon Core AI (Contact information available upon request)