

# TERENCE CHAU

## EDUCATION

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**Ph.D. Public Policy**, University of Chicago August 2023  
Ph.D. Coursework: Microeconomics, Labor Economics, Econometrics, Machine Learning, Political Economy

**Bachelor of Economics**, Universidad de Costa Rica 2016

## SKILLS

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<b>Programming</b>	R, Python, GIS, SQL, Apache Spark (Scala), AWS S3, AWS SageMaker, Git, Stata
<b>Areas of Expertise</b>	Economics, Econometrics, Causal Inference (Experimentation & Observational Studies), Machine Learning, Causal ML

## WORK EXPERIENCE

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

- Provide scientific direction and oversight to causal inference & machine learning projects related to personalized learning and public safety:
  - Design randomization plans, power calculations, and pre-analysis plans for various projects, including one of the [largest A/B tests in social science](#) ( $N \geq 27,000$ ).
  - Direct analysis of experiments and quasiexperiments using cutting edge statistical methods and tools including multidimensional regression discontinuity, personalized treatment effects, and non-standard randomization inference on compute clusters.
  - Write research articles, grant proposals, and other forms of research communication.
  - Coordinate with and communicate research insights to a broad range of audiences, ranging from school district staff to foreign government officials.

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

- Owned project measuring causal effects of \$300 million workforce safety initiative by estimating instrumental variables and survival models in Spark on individual-level data with hundreds of millions of observations.
- Built strong relationships and lines of communication with teams of engineers, economists, and business experts to refine causal inference model.
- Effectively communicated complex insights to non-technical stakeholders, which persuaded them to agree to run a follow-up large scale, nationwide experiment. Assisted experimental design according to operational constraints.
- Received full-time offer.

**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.
  - Devised approaches to link patents to all 1850-1880 US manufacturing businesses using archival data and machine learning. Described the relationship between firm characteristics and propensity to patent.
- Other projects:
  - Built comprehensive US business dataset observing all manufacturing firms between 1850-1880 by linking historical censuses using random forests and XGBoost. Managed 20 research assistants to label training data.

- 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.
- Predicted domestic abuse recidivism in Manchester, UK. Showed police protocols to predict 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 estimation 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

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- Dr. Jens Ludwig, Edwin A. and Betty L. Bergman Distinguished Service Professor, Harris School of Public Policy, University of Chicago, & Pritzker Director of the University of Chicago Crime Lab and Education Lab. ([jludwig@uchicago.edu](mailto:jludwig@uchicago.edu))
- (Ph.D. Co-Chair) Dr. Jeffrey Grogger, Irving Harris Professor in Urban Policy, Harris School of Public Policy, University of Chicago ([jgrogger@uchicago.edu](mailto: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](mailto:richard.hornbeck@chicagobooth.edu))
- Dr. Vikram Pathania, Principal Economist, Amazon Core AI (Contact information available upon request)