Willy (Wei-Li) Chen

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SUMMARY

Ph.D. candidate in Economics at Michigan State University (expected 2027) specializing in the technology labor market and applied econometrics. Eight years of programming experience in R and three years in Python and SQL, including fine-tuning and running large language models on HPC clusters to process tens of millions of employment records and other large data. Nine years of experience applying causal inference methods, including difference-in-differences, event studies, and natural experiments. Experienced in teaching undergraduate and Ph.D.-level economics courses, leading a six-week online introductory R workshop at the University of Chicago, and presenting research to academic and non-technical audiences.

SKILLS

Programming	R (tidyverse, data.table, rvest, sf, ggplot2), Python (pandas, NumPy, scikit-learn, PyTorch), SQL (PostgreSQL, DuckDB), Stata, Git, LaTeX, Microsoft Office, SLURM
AI / ML	LLM fine-tuning (Llama-3.1 8B with mlx-lm, Hugging Face), large-batch GPU inference with vLLM on HPC clusters (SLURM), NLP text classification, Lasso/Ridge, data splitting, cross-validation, model validation, ensemble methods, dimensionality reduction, LLM APIs (Claude, DeepSeek, Qwen)
Causal Inference	Difference-in-differences (including staggered adoption), event studies, synthetic control, instrumental variables, regression discontinuity (RDD), propensity score matching, inverse probability weighting, randomized experiments and A/B testing, natural experiments, double machine learning (DML), fixed effects and panel methods, decomposition methods, hypothesis testing, power analysis
Modeling	Structural estimation, game theory, signaling and screening models, network analysis, measurement
Data	Exploratory data analysis (EDA), data cleaning, web scraping, record linkage at scale (tens of millions of records), geospatial data, administrative and survey data, panel data, data visualization
Communication	Presentations to technical and non-technical audiences, research memos, academic writing, teaching

EDUCATION

Michigan State University — East Lansing, MI
Ph.D., Economics — 2022 – 2027 (expected)
- Fields: labor economics, applied econometrics; coursework includes industrial organization
- ICER NASA Open Science Scholars Fellow (2026); Peter Schmidt Outstanding First-Year Student Award (2023)

The University of Chicago — Chicago, IL
M.A., Economics — 2019 – 2020
- Director's Scholarship (2019); Phoenix Research Award (2019)

The Ohio State University — Columbus, OH
B.S., Mathematics (Theoretical); B.S., Economics — 2015 – 2019
- Summa cum laude with research distinction; DataFest 2019 Honorable Mention (athlete on-field sensor data)

RESEARCH & DATA PROJECTS

"Discounted Degrees: Employer Frictions and High-Skilled Talent Misallocation" — 2025
Sole author; job market paper
- Studied how the cost of screening and sponsoring domestic/foreign-trained workers (H-1B, OPT) leads to allocation into jobs for which they are overqualified
- Built a career panel of 44M workers from public LinkedIn profiles and created a correspondence to H-1B sponsorship filings, BLS occupational wages, and O*NET job requirements; executed the pipeline on MSU's HPC cluster
- Fine-tuned a Llama-3.1 (8B) model and conducted inference using cluster GPUs with vLLM to map 76M free-text job titles, in any language, to standard occupation codes, matching 97.6% of titles. Audited coverage against Census data
- Ranked employers using a worker affinity algorithm, PageRank, based on revealed-preferences from firm-to-firm job moves à la Sorkin (2018). PageRank is used by Google in other industry contexts
- Used the 2008 STEM-OPT work-permit extension as a natural experiment (difference-in-differences), finding that hiring frictions persist through workers' first decade in the U.S.
- Presented at Midwest Economics Association and Washington University Economics Graduate Student Conference

"Talent Reallocation Amid Silicon Valley Tech Layoffs" — 2026
Co-authored with H. Bae and X. Li; work in progress
- Early result: laid-off tech workers are more likely to take same-level positions at lower-ranked tech firms
- Tracked where workers laid off by large tech firms move to: which firms and roles absorb them, and what the layoff costs them in career and earnings

- Matched layoff events from public layoff trackers to 44M-worker LinkedIn panel built in job market paper; ranked firms by revealed worker preference (Sorkin method)

Open-Source Job-Title Classifier 2026
Sole author; funded by the ICER NASA Open Science Scholars Fellowship
- Built a public version of the job-title classifier built in job market paper (the original's training data is proprietary)
- Completed NASA's Open Science 101 course (certificate on ORCID)

"Over a Century of Economics Research Collaboration" 2025
Co-authored with X. Qiao and H. Zhang; SSRN working paper
- Built a co-authorship network of 120K economists and 500K+ articles to measure how collaboration changed between 1893—2025; presented at Allied Social Sciences Association (ASSA) and Midwest Economics Association in 2024

Other Papers
- "Analysis of School-Level Vaccination Rates by Race, Ethnicity, and Geography in New York City," *JAMA Network Open*, 2022 (with B. Elbel, A. E. Schwartz, et al.)
- "The Relationship between Entrée Variety and Student Participation in School Lunch," SSRN working paper, 2025 (with S. Toossi and A. E. Schwartz)
- "Descriptive Units of Heterogeneity: An Axiomatic Approach to Measuring Heterogeneity," *Social Choice and Welfare*, resubmitted (sole author)

EXPERIENCE

Michigan State University 2023 – 2024
Graduate Research Assistant to Prof. Hanzhe Zhang *East Lansing, MI*
- Built and maintained a co-authorship network covering 120K economists and over 500K publications to analyze historical patterns in research collaboration; co-authored SSRN working paper.

Syracuse University, Center for Policy Research 2020 – 2022
Research Associate *Syracuse, NY*
- Analyzed student-level longitudinal records from the NYC Department of Education; co-authored paper in *JAMA Network Open* (2022) and working paper on school-meal participation
- Wrote and presented weekly internal memos summarizing analyses and findings for the project team

TEACHING

Michigan State University 2022 – Present
Instructor of Record *East Lansing, MI*
- Introduction to Microeconomics (EC 201; 45 first-year students, Summer 2025)

Teaching Assistant
- Intermediate Microeconomics (EC 251H/301; Fall 2022, 2024, 2025; Spring 2026)
- Ph.D. Game Theory (EC 812B; Spring 2024, 2025, 2026)

The University of Chicago 2019 – 2020
Teaching Assistant *Chicago, IL*
- Principles and Intermediate Microeconomics (ECON 100, 200, and 201; full year)

Online Workshop: Principles of Data Visualization in R 2020
Instructor *Remote*
- Designed and taught workshop for students in the Master of Arts Program in the Social Sciences (MAPSS) who has little or no coding experience: R basics, ggplot2, tidyverse, text data, panel data, R Markdown automation, and Git
- Materials, slides, and exercises: willythewoo.github.io/WillyTheWoo/workshop

The Ohio State University 2017 – 2019
Calculus Tutor, Mathematics & Statistics Learning Center *Columbus, OH*

ADDITIONAL SKILLS

- **Languages:** English, Mandarin, Taiwanese (fluent in all)
- **Leadership:** Director of Event Planning, MSU Council of Graduate Students; Lead Sailing Instructor, MSU Sailing Center (U.S. Sailing Level 1)

REFERENCES

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