Douglas Williams

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EDUCATION

The University of Chicago   Chicago, IL
Bachelor of Sciences in Data Science with Honors & Bachelor of Arts in Public Policy with Honors   June 2024
GPA: 3.84/4.00

PUBLICATIONS

Asylum Seekers and the Rise in Homelessness   August 2025
- Expanded on senior thesis, found 60% of record 2022-2024 sheltered homelessness rise was composed of recent migrants
- Conditional acceptance to the Journal of Public Economics, NBER working paper DOI: 10.3386/w33655

AWARDS & HONORS

Data Science Clinic Project of the Year   Received May 2024
- Awarded by UChicago Data Science Institute for work with Fermi Labs creating models to simulate particle collisions

Stone Center Undergraduate Thesis Award   Received May 2024
- Awarded by UChicago Stone Center for Research on Wealth Inequality and Mobility for thesis identifying, localizing, and quantifying new trends in US homelessness
- Expanded analysis to 2024 data for "Asylum Seekers & the Rise in Homelessness" paper accepted for publication

Excellence in Academic & Research Support Award   Received May 2024
- New award created for my work over a year both designing and working as a teaching assistant for the new UChicago course Sense & Sensibility & Science

Harper Award for Exceptional Academic Performance   Received March 2023
- Nominated by Policy Implementation professor for exceptional final project and course performance
- Final project performs an organizational analysis of Los Angeles Police Department's use of predictive policing, describing how external cultural pressures and expertise asymmetry enabled a policing tech startup to scale an unproven product across the nation, costing millions in taxpayer dollars

Public Policy Leaders Policy Simulation 2022 Grand Prize Winner   Received May 2022
- Won 1st place and $2,500 for proposed supply chain optimization to address spiking softwood lumber import prices
- Analyzed state-level data and formulated subsidy scheme to lower prices by aligning demand with excess inventory markets

Public Policy Leaders Program   May 2021 – June 2024
- Selected into class cohort of ~24 via competitive application process at end of freshman year
- Participated in exclusive policy writing, speaking, analysis, and professional development programming

The Gate Editor's Pick   Received March 2021
- Awarded by UChicago's The Gate campus policy and politics publication for writing editor's favorite article of the winter quarter publication cycle
- Article covered Massachusetts police reform and reactions to it from social justice organizations

NON-CID PROFESSIONAL EXPERIENCE

Comprehensive Income Dataset Project   Chicago, IL
Pre-Doctoral Fellow – Full-time   August 2024 – Present
- Use linked restricted federal administrative microdata to investigate US homelessness with professors Bruce Meyer (UChicago) and Angela Wyse (Dartmouth)
- Wrangle, summarize, and analyze restricted access microdata from US Census Bureau and Internal Revenue Service to provide new longitudinal insights on the status transitions, data coverage, resources, mortality, and demographic trends of the US unhoused population

University of Chicago   Chicago, IL
Co-Instructor   April 2025
- Gave two paid lectures to UChicago undergraduate course Sense & Sensibility & Science, a course about distilling best practices for policy and personal decision-making from the practice of science
- Lecture one was on scientific modeling: its relationship with theory and hypothesis testing, how it can be used to structure analysis, and how assumptions that guide inquiry are derived from such models
- Lecture two was on causality: what it is, when it is and isn't used, how it fits in the practice of modeling, and the additional considerations it creates for structuring inquiry

Boston Consulting Group X   Chicago, IL
Summer Associate / Data Scientist – Full-time   June 2023 – August 2023

- Analyzed market reports and proprietary sales data to explain market and consumer behavior shifts for fortune 500 retailer
- In charge of developing an automated pipeline (in Python) to check outputs of 200+ machine learning models and computed measures of digital pricing and forecasting tool whenever software team rolled out a software or methodological update
- Pipeline collected data from all models and tool outputs, cleaned and ran algorithmic checks to flag concerning estimate changes between patches, and then generated presentation-ready visualizations summarizing shifts
- Pipeline is still used to trigger internal investigations of unexplained output shifts; outputs reported using presentation template I created to package visualizations and presented to senior leadership

University of Chicago Data Science Institute   Chicago, IL
Teaching Assistant – Part time   January 2023 – March 2023
- Teaching assistant for UChicago intro to probability and multi-variate calculus course (Math Methods for Data Science I)
- Topics included random variables, probability distributions, conditional probability, expected values, the central limit theorem, integration of functions of several variables, sums and transformations of random variables, multivariable calculus - partial derivatives, gradients, and gradient descent

UChicago Data Science Institute   Chicago, IL
Data4All Mentor – Part-time   October 2022 – May 2023
- Taught data science to Chicago public high schoolers from groups underrepresented in STEM
- Guided 48 students through weekly project-based curriculum that adjusted and updated to meet interests of various students
- Taught students Python, data wrangling, visualization, hypothesis testing, and presentation skills

Boston Consulting Group   Chicago, IL
Summer Associate – Full-time   June 2022 – August 2022
- Worked with Chicago Civic Committee to get minority-owned suppliers in Chicago contracts with top financial institutions (e.g. Bank of America, Northern Trust, etc.) to reduce racially disparate impacts of COVID on small businesses
- Was placed in charge of independently identifying, contacting, developing materials for, and preparing the staff of 27 marketing and IT firms to pitch to financial institutions
- Developed Excel workflows and presentation materials for executive leadership teams of minority-owned suppliers and presented project goal updates to Chicago Civic Committee and BCG senior leadership

270 Strategies   Chicago, IL
Seasonal Associate – Full-time (June – Aug.), Part-time (Sept. – Dec.)   June 2021 – December 2021
- Pulled, organized, and visualized FEC election contribution data for 12 states to identify and explain shifts in Republican election fund allocation
- Worked with Invenergy, leading US green energy developer, to track public response to outreach campaigns aiming earn local trust for development projects
- Scraped millions of social media posts, blogs, forum comments, and news stories and applied natural language processing sentiment analysis techniques on collected data to gauge public response to Invenergy development and outreach projects
- Visualized analysis in weekly reported dashboard and uncovered key opposition groups and their messaging

Blackroots Alliance   Chicago, IL
Policy Intern – Part-time   November 2020 – July 2021
- Performed analysis of 2021 Chicago city budget proposal to identify new priorities and funding opportunities
- Wrote policy briefs of bail reform amendments as they were released in December to support grassroots organizers in adjusting goals and messages
- Created, produced, hosted, and edited interviews with 9 Chicago activists for three episodes of The Grove Podcast
- Created promotional graphics, podcast art, and logos alongside a marketing plan for The Grove Podcast

Newton Budget Reform Organization for Social Justice   Newton, MA (Remote)
Government Relations Lead – Part-time   September 2020 – September 2021
- Trained 24 members on public speaking, advocacy, writing, new internal processes, and marketing skills to raise awareness of housing and criminal justice inequities in the Greater Boston Area
- Designed community outreach programming, led goal-setting workshops, managed relationships with city council candidates
- My team and I were consulted by city council candidate on housing and equity policy agendas before public campaign launch

PROJECTS

Improving Cook County Property Tax Assessment   Chicago, IL
Predictive Modeling Project with Cook County Assessor's Office (CCAO)   December 2024 – February 2025
- Proposed improvements to Cook County's property valuation models, the property sale value predictions of these models are the basis for all property taxes which account for $18 billion of Cook County tax revenue

- Recommended new condominium valuation residual model predicting difference between true sales and a 5-year rolling average sale price per building (sales weighted by recency), currently used to value all Cook County condos for property taxes
- Created visualizations evaluating the model's accuracy bias with respect to time and how it captures sales price variance, which are now incorporated into county's annual residential model evaluation process
- Discovered training data lacked relevant covariates to account for post-2021 sales patterns (surge in prices and sales variance), limiting effectiveness of model adjustments and suggesting a need for improved feature collection by the county

Generative AI Particle Simulation   Chicago, IL
AI & Physics Project with Fermi National Accelerator Laboratory   September 2023 – March 2024

- Worked with 2 physicists at Fermi National Labs developing generative AI models to simulate high-energy particle collisions, independently in charge of exploring two methodologies (latent diffusion and consistency models)
- Designed and built models in Python (PyTorch), trained models on calorimeter data from 200,000+ accelerator experiments
- Evaluated model accuracy using custom visualizations of particle energy distributions
- Won UChicago Data Science Clinic Project of the Year
- Code and write-up for early consistency model test I did (forked from latent diffusion pipeline we built): https://github.com/Douglasmsw/CaloConsistency/blob/main/Computer_Vision_Final_Project.pdf

AI-Driven Manipulation of 3D Geometry   Chicago, IL
Computer Graphics & AI Research with 3DL Geometric Deep Learning   September 2022 – June 2024

- Led research effort to create algorithms which optimize color, shape, and parameterization of 3D polygonal meshes to match guidance from semantic prompts (text and/or images)
- Designed and tested novel deep learning and geometry update algorithms pulling from the fields of computer graphics, geometry processing, unsupervised learning, and deep learning
- Led weekly lab update presentations and delegated work items to team

Computer Graphics Applied to Robot Environment Mapping   Chicago, IL
Exploratory Research with Robot Intelligence through Perception Lab   June 2023 – September 2024

- Developed algorithm to train a neural network using pictures to iteratively construct 3D representation of said environment live while a robot with a mounted camera explores a space
- Added "semantic" component, which uses another unsupervised model to provide an abstract prior for image information to improve the speed and quality of reconstruction (project write-up can be found here)
- Worked with Toyota Technological Institute RIPL lab PhD student to explore application of Gaussian Splatting 3D reconstruction technique to Simultaneous Localization and Mapping (SLAM) problem

Organizational Analysis of Los Angeles Predictive Policing   Chicago, IL
Policy Implementation Case Study   March 2023

- Investigated techno-social factors which (a) motivated the Los Angeles Police Department's adoption of predictive policing technology and (b) led to the lack of accountability and potential failure of the program
- Identified flaws in evaluative literature of program pilot and proposed new evaluation standards
- Build upon theory of organizational "big data" technology adoption and expand to identify concerning patterns in broader "big data" market companies
- Write up can be found here: https://docs.google.com/document/d/12HPEf8oHYPNi6HAb0D7WVmSnDsr5zSuhtd3eFL_F9bQ/edit?usp=sharing

VOLUNTEERING

Neighbors United for Mutual Support   Chicago, IL
IT Support Volunteer   May 2025 – Present

- Organization provides legal and financial aid to recent Latin American migrants in Chicago as they get established and navigate the immigration process
- I provide IT support including setting up computers, cloud file management, fixing printers, and ad-hoc website feature requests like a humanitarian aid request form

SKILLS & PROFICIENCIES

- **Clearances:** Special Sworn Status (for access to restricted federal microdata)
- **Coding Tools:** Python (Advanced), Stata (Advanced), R (Intermediate), Git (Intermediate), SQL (Beginner)
- **Office Tools:** Microsoft and Google office suites (Excel, PowerPoint, etc.) with advanced mastery
- **Skills:** data science (wrangling, engineering, visualization, analysis), statistical modeling, machine learning, deep learning, computer vision, geometry processing, natural language processing, persuasive writing, public speaking