Jeffrey Lu

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Education

University of Illinois Urbana-Champaign *Champaign, IL*
B.S. in Computer Science, Minor in Statistics August 2024 – Expected May 2027
Relevant Coursework by Spring 2025: Data Structures, Probability & Statistics for Computer Science, Computer Architecture, Discrete Structures, Calculus III, Linear Algebra, Physics: Mechanics, Physics: Electricity & Magnetism
Honors: Chancellor's Scholar (Campus Honors Program), Honors Living-Learning Community
Extracurriculars: Quant@Illinois, AQTE, SigPwny, VR Club

Relevant Experience

Northwestern University *Evanston, IL*
Research Assistant, Professor John B. Ketterson May 2023 – October 2023
- Assessed the effects of drilling holes with varying shapes and orientations on the performance of type-II superconductors
- Developed and executed **bash scripts** in Unix to automate CUDA simulations that determine the conductivity of superconductors with different hole configurations
- **Visualized** and **analyzed** the results using Python **Matplotlib** and **NumPy**
- Wrote a report and presented my findings at a research symposium

Illinois Institute of Technology *Chicago, IL*
Research Assistant, Professor Jeff Wereszczynski May 2022 – September 2022
- Researched the virtual docking of ENL protein to determine potential inhibitors that may prevent leukemia
- Programmed and executed **Python-based simulations** to test the efficacy of various pharmaceutical drugs as inhibitors
- Co-wrote a report and presented my findings at a research symposium

Select Projects

Modeling the Future Challenge
Studied obesity in America | *Python* August 2024 – May 2024
- Employed a **Random Forest model** to decipher leading factors behind obesity
- Developed **transition matrices** as part of a **Markov chain** to model future obesity trends
- Ascertained the **severity of risks** associated with obesity and different **regression models**
- Formulated mathematically-based recommendations to mitigate the effects of obesity

Analyzed teacher shortage in Chicago | *MATLAB* August 2023 – May 2023
- Applied a **Fourier transform** and **linear regression** to predict future teacher shortage levels
- Incorporated a **Random Forest model** and performed a **Sensitivity Analysis** to decipher leading factors
- Devised mathematically-based strategies to address the teacher shortage crisis

MathWorks Math Modeling Challenge
Investigated the housing crisis in America | *Python* March 2024
- Created an **agent-based model** to simulate how the housing market will change in the future
- Utilized **Fourier transform** and **linear regression** to forecast trends in homelessness
- Combined a **Random Forest model** with the previous models to put forth recommendations to combat the housing crisis

Predicted the importance of electric bikes (e-bikes) in future America | *Python* March 2023
- Applied a **Systems Dynamics approach** to detail future trends of e-bike sales
- Constructed a **Predator-Prey Model** to quantify the impact e-bikes will have on American carbon emissions, traffic congestion, and health

Skills

Programming Languages: C++, Java, Python, SQL, Bash, HTML, CSS, Typescript, MDX, Javascript
Data Tools: Microsoft Excel, Google Sheets, Jupyter Notebook
Platforms: Visual Studio, VS Code, Anaconda, Git, Unix, PyCharm