Akshay Pandit

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Urbana, IL (217)-721-8196

EDUCATION

University of Illinois at Urbana-Champaign *Urbana, IL*
Candidate for PhD in Computational Science and Engineering *Aug. 2020 – Dec 2025 (Expected)*
GPA: 3.8/4.0
Master of Science in Applied Statistics *Sept 2022 – Dec 2023*
GPA: 3.7/4.0
Master of Science in Civil and Environmental Engineering *Aug. 2018 – Aug 2020*
GPA: 3.8/4.0

Delhi Technological University *New Delhi, India*
Bachelor of Technology in Civil Engineering *Aug 2013 – May 2017*
GPA: 73/100 (First Class)

TECHNICAL SKILLS & RELEVANT COURSES

Programming Languages/Frameworks: *Proficient*: Python (Pandas, NumPy, SciPy, Scikit-learn, PyTorch, Torchvision), R, SQL, NoSQL databases | *Basic*: C, C++, Bash | **OS:** Linux

Certifications: Bloomberg Market Concepts **Link**, Akuna Capital Options 101 **Link**, Akuna Capital Options 201 **Link**

Mathematics: Stochastic Processes (ECE 534), Intro to Optimization (ECE 490), Numerical Analysis (CS 450)

Algorithmic Trading: Algorithmic Market Microstructure (FIN 556), High Frequency Trading (IE 421)

ML and Data Science: Machine Learning (CS 446), Statistical Learning (STAT 542), Pattern Recognition (ECE 544)

TRADING PROJECTS

WorldQuant LLC *Urbana, IL*
Research Consultant *Dec 2024 – Present*

- Generated 50+ D1 alpha signals with average **sharpe ratio** of **2.2** and **fitness** of **1.8**.
- Explored, developed, and backtested alpha signals using 100K+ datafields from 8+ regions on WorldQuant Brain platform.
- Ranked in top 10 among 3000+ teams in ongoing International Quant Championship 2025 in the US
- Ranked 6th (University rank: 1st) in WorldQuant's Alphathon trading competition out of 1000+ participants.

Algorithmic trading bot on Solana blockchain *Urbana, IL*
Guide: Prof. David Lariviere, **FinTech Lab** *Jan 2024 – May 2024*

- Developed a scalable ETL pipeline to ingest and analyze on-chain price/volume data, and implement alpha-generating strategies driven by momentum and volatility signals.
- Designed and integrated risk management mechanisms to safeguard against rug-pulls and trade in safer tokens.
- Conducted rigorous backtesting across 100+ token pairs, achieving a **Sharpe ratio of 1.78** during 2+ months of live trading.

High-Frequency Market-Making Strategy Backtesting *Urbana, IL*
Guide: Prof. David Lariviere, **FinTech Lab** *Aug 2023 – Dec 2023*

- Collaborated in a 4-member team to design and backtest high-frequency market-making strategies using Level 2 order book data for equities and cryptocurrencies.
- Built a Python ETL pipeline to extract, and process 20GB+ monthly tick data from 3+ crypto exchanges via API endpoints.
- Optimized Ichimoku, Moving Average, and VWMA strategies and delivered a profitable strategy with **Sharpe ratio: 1.58**.

PROFESSIONAL EXPERIENCE

Corteva Agriscience *Urbana, IL*
Deep Learning Intern, Bioinformatics Team *May 2022 – Aug 2022*

- Developed and fine-tuned a **BERT**-based **NLP** model (BERTax) for genome classification, outperforming traditional sequence-based tools.
- Processed and analyzed 10K+ genome assemblies across taxonomic levels, improving model robustness across fragmented data.

- Achieved 95% prediction consistency, surpassing the industry benchmark (Kraken2 at 93%), validating the model's scalability and accuracy.

Caterpillar Inc. *Remote*
Data Scientist Intern, CatDigital *May 2021 – Aug 2021*

- Built a **Random Forest** model to predict asset ownership changes, improving accuracy from 75% to 82% and precision from 79% to 88%, enhancing user recommendation systems.
- Extracted and processed 100K+ records from a **SQL** database, reducing class imbalance by 1000% with under-sampling.
- Built a CI/CD pipeline to streamline model training and deployed the model on AWS SageMaker for real-time predictions.

RESEARCH EXPERIENCE

University of Illinois, Urbana-Champaign *Urbana, IL*
Graduate Research Assistant, Konar Research Group *Jan 2019 – Present*

Dissertation: Impact of Trade on Agricultural Productivity
Guide: Dr. Megan Konar

Chapter 1: Examine the correlation between trade and agricultural productivity (*Published*)

- Developed a scalable ETL pipeline in R to process 60+ years of FAO data across 245 countries and 100+ commodities.
- Applied advanced statistical analysis to quantify trade's impact on agricultural productivity.
- Leveraged Data visualization using **ggplot2** to show that high-yield countries have larger export shares than production shares, highlighting trade's role in boosting yields.

Chapter 2: Determine the causal impact of global trade on agricultural variables (*Under Review*)

- Researched and modeled the causal effect of trade on yields and groundwater depletion using 2SLS, PPML, and Iterative 2SLS Instrumental Variables (IV) models addressing endogeneity and reverse causality.
- Modularized the code to extract and process data using **SQL** and implement models using fixest package in R.
- Concluded that trade boosts yields and reduces groundwater depletion, favoring globalization over self-sufficiency.

Chapter 3: Estimate the spatially resolved bilateral trade links in the US-China agri-food system (*Published*)

- Investigated spatial connections in US-China agri-food trade by estimating sub-national trade between China and the US.
- Processed and integrated 3 national datasets (2017) by developing custom crosswalks for seamless data interoperability.
- Designed a downscaling algorithm and visualizations in **Matplotlib** to estimate 3K state-province and 160K+ county-province trade links
- Discovered that the top 5 trade links and transit hubs drive over 70% of bilateral agricultural trade, exposing vulnerabilities to supply chain disruptions and resource depletion.

Chapter 4: Ascertain the causal impact of China joining the WTO on US agriculture (*Under Progress*)

- Researching and modeling the causal effect of China joining the WTO on US agricultural variables and groundwater stress using stacked First-difference Instrumental Variables (IV) model addressing endogeneity and reverse causality.
- Developing replicable modularized production-level codebase in Python to extend the study for other nations.

PUBLICATIONS AND RESPONSIBILITIES

- **[Publication]** Global agricultural yields and trade over the last half century, **A. Pandit**, M. Konar, P. Debaere. *Environmental Research: Food Systems*, 2025 **Link**
- **[Publication]** Spatially detailed agricultural and food trade between China and the United States, **A. Pandit**, D. B. Karakoc, M. Konar. *Environmental Research Letters*, 2023 **Link**
- **[Publication]** Hydro-social metabolism: scaling of birth rate with regional water use, S. Pande, **A. Pandit**. *Palgrave Communications* (*Nature*), 2018 **Link**
- **[Presentation]** High-resolution Mapping of US-China Bilateral Agricultural and Food Supply Chains, **A. Pandit**, D. B. Karakoc, M. Konar, *American Geophysical Union Conference*, 2022
- **[Teaching Assistant]** Machine Learning (CS446) Fall 2025