Akshay Pandit

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Urbana, IL   217-721-8196

EDUCATION

University of Illinois at Urbana-Champaign *Urbana, IL*
Candidate for PhD in Civil Engineering (*Computational Science and Engineering*) *Aug. 2020 – May 2025* (*Expected*)
GPA: 3.7 / 4.0

University of Illinois at Urbana-Champaign *Urbana, IL*
Master of Science in Applied Statistics *Sept 2022 – Dec 2023*
GPA: 3.7 / 4.0

TECHNICAL SKILLS & RELEVANT COURSES

Languages: *Proficient*: Python, R, *Basic*: C, C++, Bash **OS:** Linux

Certifications: Bloomberg Market Concepts Certification **Link**

Mathematics: Stochastic Processes (ECE 534), Intro to Optimization (ECE 490), Applied Regression Design (STAT 425), Numerical Analysis (CS 450), Sampling and Categorical Data (STAT 426)

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), Intro to Data Mining (CS 412)

PROFESSIONAL EXPERIENCE

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

- Implemented BERT-based NLP model (BERTax) for genome classification to compare with existing sequence-based tools

- Processed 10,000+ genome assemblies across different taxonomic levels to test BERTax over different fragment classes

- Performed benchmarking against top sequencing model (Kraken2) achieving 95% consistency in prediction compared to 93% for Kraken2 suggesting BERTax can replace sequence-based tools

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

- Built a Random Forest supervised ML model for an ensemble of 10 models that predicts change in asset ownership

- Analyzed 100K+ examples with 100+ features and applied under-sampling techniques reducing class skewness by 1000%

- Integrated the model into an ensemble framework, boosting accuracy from 75% to 82% and precision from 79% to 88%, enhancing user recommendations

TRADING PROJECTS

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

- Created a trading bot for meme coins on Solana to track new token pairs and trade based on price and volume trends

- Developed scripts to track new pairs, find buy signals, interact with Solana AMM for swaps, and build trading logic for sell signals

- Backtested strategy for 100+ meme coins with net profit, but live trading faced net losses due to public node latency

Backtesting HFT market-making strategies *Urbana, IL*
Guide: Prof. David Lariviere *Aug 2023 – Dec 2023*

- Worked in a team of 4 to backtest high-frequency trading (HFT) market-making strategies, utilizing market microstructure data for cash equities and cryptocurrencies

- Wrote downloader and parser scripts to obtain data from 3+ crypto-exchanges and parse it for Strategy Studio back tester

- Backtested Ichimoku, Moving Average, and Volume-weighted moving average strategies over 1 month period producing net losses (Gitlab repo)

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 (*Under Review*)

- Applied weighting and decomposition analyses allowing for a nuanced understanding of how trade impacts productivity

- Analyzed and cleaned 60+ years of data from the FAO for 245 countries across 100+ food commodities

- Showed that trade increases global agricultural yields over time, with high-yielding countries having higher export shares than production shares

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

- Researched and applied econometric methods to investigate the causal relationship between trade, agricultural variables, and groundwater depletion

- Built models using 2SLS Instrumental Variables (IV), PPML IV, and Iterative 2SLS IV approaches to address reverse causality and endogeneity concerns

- Concluded that increased trade causally boosts global agricultural yields and reduces groundwater depletion, supporting the productivity of 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, estimating trade between Chinese provinces and U.S. states/counties.

- Processed 3 national datasets for 2017 and created multiple crosswalks for interoperability.

- Developed a downscaling scheme to integrate datasets and estimated 15,469 and 713,806 link-level connections at state-province and county-province resolutions.

- Found that top 5 link-level connections and transit hubs account for over 70% bilateral agricultural trade, making the network vulnerable to supply chain shocks and resource depletion.

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

PUBLICATIONS AND PRESENTATIONS

- [**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

- [**Presentation**] How does trade impact agricultural productivity?, **A. Pandit** *American Geophysical Union Conference*, 2021