Akshay Pandit

apandit2@illinois.edu — Website — Linkedin — Github

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++

Mathematics: Stochastic Processes, Intro to Optimization, Applied Regression Design, Numerical Analysis, Sampling and Categorical Data

Algorithmic Trading: Algorithmic Market Microstructure, High Frequency Trading

ML and Data Science: Machine Learning, Statistical Learning, Pattern Recognition, Intro to Data Mining

PROFESSIONAL EXPERIENCE

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

- Researched RNN and transformer-based NLP models and how they compare to sequence-based genome classification
- Processed 10,000+ genome assemblies across different taxonomic levels to test the BERT-based classification model (BERTax) over fragment classes
- Performed benchmarking against top sequencing model (Kraken2) achieving 95% consistency in prediction suggesting NLP-based models can replace sequence-based tools

Caterpillar Inc. *Remote*
Data Scientist Intern, CatDigital *May 2022 – Aug 2022*

- Built a tree-based supervised machine learning model for an ensemble of models that predicts change in asset ownership
- Analyzed 100K+ examples with 100+ features and applied under-sampling techniques reducing class skewness to 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

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

- Worked in a team to backtest high-frequency trading (HFT) market-making strategies, utilizing market microstructure data for cash equities and cryptocurrencies
- Developed downloader and parser scripts to obtain data from crypto-exchange and parse it for Strategy Studio back tester
- Backtested Ichimoku, Moving Average, and Volume-weighted moving average strategies over 1 month period for cash equities and cryptocurrencies achieving net losses (Gitlab repo)

Automated trading bot for meme coins on Solana blockchain *Urbana, IL*
Guide: Prof. David Lariviere *Jan 2022 – May 2022*

- 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

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
- Cleaned 60+ years of data from the FAO for 245 countries across 100+ food commodities
- Found 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