Ziheng (Jack) Chen

+1 312-823-6315 ◇ zihengchen2000@gmail.com ◇ zihengjackchen.com ◇ linkedin.com/in/zihengjackchen/

Education

University of Illinois Urbana-Champaign (UIUC) Aug 2023 – May 2025
Master of Science in Computer Engineering GPA: 4.00/4.00

University of Illinois Urbana-Champaign (UIUC) Aug 2019 – May 2023
Bachelor of Science in Computer Engineering, Minor in Mathematics GPA: 3.99/4.00 (Highest Honor)

Work Experience

Software Engineer Intern (co-op), StoneX Group – Chicago, IL Jan 2023 – June 2023

- Engineered from scratch an evaluation pipeline with `pandas` to benchmark prototypical commodity price indices
- Quantified the potential profitability of commodity indices generated from 200 index configurations, surpassed target by 23.3% in 10-year total return and 8.8% in Sharpe Ratio with the top-performing tested index
- Expedited benchmarking processes by scaling up job clusters in `Databricks`, reducing waiting time by 3,000%
- Created an actively utilized `Python` script for `CI/CD` on `Azure DevOps` to automate `Databricks` workflow migration from testing to production environments, eliminated manual operations and greatly enhancing overall productivity

Data Engineer Intern (co-op), StoneX Group – Chicago, IL Aug 2022 – Dec 2022

- Researched and deployed a proxy to integrate `Okta` authentication into an existing cloud application using `Docker`
- Optimized the data curation ETL pipeline for a data-serving application to cut waiting time by 20 times to 5 seconds
- Developed a real-time usage analysis dashboard in `Splunk`, featuring dynamic filters for associates and categories

Data Engineer Intern (full-time), Ecolab – Saint Paul, MN May 2022 – Aug 2022

- Profiled global sales history table in `Snowflake`, identifying 201M invalid rows to enhance data integrity
- Automated `SQL` query generation through `Python` and `APIs` to streamline the evaluation of data quality and usability

Projects

Traffic Risk Assessment and Mitigation, *Autonomous Vehicles, Safety, End-to-end* Aug 2023 – Dec 2023

- Utilized `alphashape` in `Python` to calculate the reachable area of a vehicle following a bicycle model to identify risky vehicles in traffic and introduced methods to improve safety in an end-to-end AV simulation
- Executed simulations in parallel with `subprocess` and `ThreadPoolExecutor` in `Python` to generate 30,000+ traces from adverse seed scenarios with varied parameters, e.g., cut-in speed and timing of safety-critical actors
- Cleansed and statistically analyzed generated datasets using `pandas`, and visualized outcomes with `seaborn` and `matplotlib`, proving the efficacy of the proposed metric over current state-of-the-art risk assignment methods
- Implemented a Reinforcement Learning Agent in `PyTorch` that uses ego-vehicle telemetry and three front-facing cameras in the perception module to achieve a 72.7% reduction in accidents through emergency braking

Friction Model Improvement in CARLA Simulator, *Autonomous Vehicles, Simulation* Sept 2022 – May 2023

- Studied the physics implemented in `CARLA` and improved the friction model as a function of weather settings
- Generated and analyzed 8,000+ vehicle traces in varying weather conditions, creating 300% more accidents
- Acquired expertise in modifying the perception, control, and planning modules in the `CARLA` simulation platform

Object Detection Neural Network, *Machine Learning, Object Detection* March 2023 – April 2023

- Implemented a YOLO-like object detector in `PyTorch` on the PASCAL VOC 2007 dataset
- Achieved 1-mAP score of 0.55 locally and 0.448 on Kaggle

Coffee4Life OS, *Linux System Kernel, System Programming, Operating Systems* Mar 2022 – May 2022

- Developed a functional 32-bit `Linux` kernel in `C` and low-level `x86 Assembly`
- Supported paging, RTC, keyboard, terminal, file system, system calls, context switching, and scheduling operations

Skills

Programming Languages `Python, C, C++, JavaScript, TypeScript, CSS, SQL, Assembly, CUDA, Bash`
Frameworks and Tools `Git, Linux, Docker, React, pandas, PyTorch, NumPy, Azure DevOps`