

NICHOLAS CHEN

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EDUCATION

Carnegie Mellon University

Sept. 2021 - Dec. 2022

M.S. in Machine Learning

University of Illinois at Urbana-Champaign

Sept. 2017 - May 2021

B.S. in Computer Science

GPA: 3.98, GRE: 169Q, 169V, 5W

Selected Coursework: Trustworthy Machine Learning | Introduction to Deep Learning | Applied Machine Learning | Computational Photography | Systems Programming | Machine Learning | Algorithms | Introduction to Bioinformatics | Artificial Intelligence | Data Mining | System Programming | Computer Architecture | Probability and Statistics for Computer Science | Smart Contracts and Blockchain Security | Data Structures | Linear Algebra | Calculus Series | Financial Machine Learning | Physics Series | Introduction to Molecular and Cellular Biology

Northside College Prep High School

Sept. 2013 - May 2017

Valedictorian, GPA: 4.0/4.0, ACT: 36

RESEARCH EXPERIENCE

Super-resolution Augmented Image Compression

Sept. 2020 – Ongoing

IBM-Illinois Center for Cognitive Computing Systems Research

Advisors: Prof. Jinjun Xiong

- Combining super-resolution and deep learning-based compression models to provide higher compression ratios, enhanced quality, and drastically improved compute performance for image files
- Defining quality measurement metrics for evaluating decompressed images

Safer Illinois and RokWall: Privacy Preserving Health Apps for COVID-19

April 2020 – Ongoing

IBM-Illinois Center for Cognitive Computing Systems Research

Advisors: Profs. Sanjay Patel and Andrew Miller

- Developing RokWall, an infrastructure for privacy-preserving centralized computation, and Safer Illinois, a decentralized contact tracing and COVID-19 passport application with over 50,000 unique users.
- Designed with AWS EC2/Nitro enclaves to guarantee user privacy, even with an untrusted host
- Implemented secure health status and exposure mapping systems to track and combat the spread of COVID-19

RTB Auction Measurement and Analysis

Sept. 2018 – May 2019

UIUC Crowd Dynamics Laboratory

Advisors: Richard Barber and Prof. Hari Sundaram

- Developed mechanisms to record real-time ad auctions and simulate natural browsing profiles
- Experimented with cause/effect patterns between various browsing behaviors and RTB bidding

AWARDS

- IBM-Illinois Center for Cognitive Computing Systems Research URAI Fellowship
- UIUC Chancellor's Scholar (Top 1% per class)
- UIUC James Scholar
- Chicago Mercantile Exchange Award for Student Achievement
- Dell Merit Scholarship Gold Award
- National Merit Scholarship
- Ayn Rand Essay Contest Winner

PUBLICATIONS

Nicholas Chen, James Wei, Vikram Sharma Mailthody, Jinjun Xiong. *Super-Resolution Augmented Image Compression*. Undergoing review at NeurIPS 2021.

Vikram Sharma Mailthody*, James Wei*, **Nicholas Chen***, Mohammad Behnia*, Ruihao Yao*, Qihao Wang*, Vedant Agarwal*, Churan He*, Lijian Wang*, Leihao Chen*, Amit Agarwal*, Edward Richter*, Wen-Mei Hwu, Christopher W. Fletcher, Jinjun Xiong, Andrew Miller, Sanjay Patel. *CoTracer and RokWall: Privacy Preserving University Health Apps for COVID-19*. **NDSS CoronaDef 2021**. (*contributed equally)

Presentation: <https://www.youtube.com/watch?v=pZOvRl6Yu2U>

WORK EXPERIENCE

Susquehanna International Group

June 2020 - Sept. 2020

Quantitative Trading Intern

- Analyzed financial data to research a profitable machine-learning based trading strategy
- Studied options market making, game theory, probability, forecasting, and behavioral psychology

Algorithmic Trading System with DNN Price Prediction

Sept. 2019 – Ongoing

- Built an end-to-end high frequency trading system including low latency market data streaming, ML price prediction, order execution, and historical back testing system
- Developed original architecture with separated convolutional blocks for multi-modal input data
- Designed an automated training procedure to systematically optimize hyperparameters and features
- Currently trade over 30 million dollars of volume daily
- Deployed on AWS Cloud Infrastructure (EC2, S3, Lambda and Cloudwatch)

Google, YouTube Search Suggest

Sept. 2019 – Dec. 2019

Software Engineering Intern

- Automated hyperparameter tuning using Vizier, a black box Bayesian optimization algorithm
- Designed and prototyped Gmbed, a YouTube recommendation and search algorithm that represents videos as vector embeddings and trains a GMM based on user watch history
- Gmbed facilitates exploration and provides novel suggestions by learning from natural user behavior

The Trade Desk

May 2019 – Aug. 2019

Software Engineering Intern

- Developed a scalable object embedding pipeline to extract semantically consistent numeric representations for discrete/categorical variables
- Implemented a deep network embedder in Pytorch, paired with Spark and AWS EMR for massive scale distributed computing targeting millions of transactions per second
- Evaluated performance on previously challenging, or even impossible problems such as site demographic estimation and user lookalike modeling
- Automated job submission in AWS Aurora and execution with Apache Airflow

US Securities and Exchange Commission

May 2018 – Aug. 2018

Quantitative Analyst Intern

- Spearheaded the Commission's implementation of machine learning techniques to more accurately and completely detect market manipulation on U.S. securities exchanges
- Developed methods to visualize trading data and curated a database of live market data
- Designed and trained a convolutional neural network classifier to detect spoofing and layering

Course Assistant for CS 361: Probability and Statistics for Computer Science Jan. 2018 – May 2018

- Selected Topics: visualizing datasets, summarizing data, descriptive statistics, probability, Markov chains, PCA, and machine learning