NICHOLAS CHEN

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EDUCATION

University of Illinois at Urbana-Champaign *Sept. 2017 - Ongoing*
B.S. in Computer Science
GPA: 3.98, GRE: 169Q, 169V, 5W
Selected Coursework: Introduction to Deep Learning | Applied Machine Learning | Computational Photography | Systems Programming | Machine Learning | Introduction to 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 | Economic Statistics | Physics Series

RESEARCH EXPERIENCE

Deep Learning-Based Image Compression and Super-resolution *Sept. 2020 – Ongoing*
IBM-Illinois Center for Cognitive Computing Systems Research
Advisors: Profs. Wen Mei Hwu and Jinjun Xiong

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

CoTracer 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
- Implemented with Intel SGX enclaves to guarantee user privacy, even with an untrusted host
- Designed an exposure mapping application 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

- Investigated the secretive and opaque online advertising ecosystem
- Developed mechanisms to observe and record real-time ad auctions
- Explored design of web crawlers to 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

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.* **Accepted to NDSS CoronaDef 2021**. (*contributed equally)

WORK EXPERIENCE AND SELECTED PROJECTS

Susquehanna International Group *June 2020 - Sept. 2020*
Quantitative Trading Intern

- Modeled financial data to research a profitable 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 10 million dollars of volume daily

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 provides an effective model for facilitating exploration and providing 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

US Securities and Exchange Commission *May 2018 – Aug. 2018*
Quantitative Analyst Intern

- Spearheaded the Commission's implementation of machine learning 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*

- Office hours, discussion section, and grading
- Topics include: visualizing datasets, summarizing data, descriptive statistics, probability, Markov chains, PCA, and machine learning