Ribhav Kapur

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Experience

Quantitative Software Engineer

Spire Trading (Jul 2021 - Current)

- Leverage sophisticated statistical techniques for High Frequency Trading.
- Analyse code mathematically checked for numerical stability and algorithmic stability.
- Develop analytical libraries and tools leveraging both open source and proprietary numerical software packages.
- Design, develop, and deploy elegant software solutions across research, alpha & signal generation, systematic and non-systematic trading.
- Build automated ETL pipelines to support rapid but controlled transition from research to live trading.

Co-Founder

Connct (Jan 2019 - Jan 2020)

- Developed a web app to aid and automate work social media influencers, increasing engagement by 50% for macro influencers and 100+% for nano and micro influencers. The platform also increased following dramatically.
- Heavy use of computer image understanding and natural language processing to understand images and text on instagram to interact with followers automatically.
- Familiarity with many APIs such as google's vision and NLP API for prototype development, And Facebook's graph API, JS webscraping and MongoDB for final product.
- Pitched to investors and secured an offer for $200k in 2 months with a $2 Million valuation.

Co-Founder

DreamTune (Jan 2020 - July 2020)

- Web app to help public rights organisations identify and gather evidence against illegal use of copyrighted content.
- Made the process exponentially more efficient while requiring 60% less time of the employees.
- Worked with guidance from Dataclef to create a CRM platform platform to reduce workload for team identifying and following up on leads.
- Created case study reports analysing the potential impact of our algorithm and found $2.6 Billion in lost revenue. Reports vetted by Mario Grech and SOCAN.
- Incorporated CI/CD for testing and development infrastructure.
- Development in React and used various libraries in javascript for web scraping for data collection.
- Acquisition interest from Dataclef but called off due to the global pandemic.

Research Assistant and Lab Programmer

Learning and Neural Lab University of Toronto (Sep 2020 - May 2021)

- Analysis of brain and behavioural data to predict when a memory is formed.
- Designing experiments to measure different aspects of memory and how they are supported by the growing brain.
- Analysis on the relation of brain development to changes in memory and learning ability.
- Increased data pre-processing speed by 8x.
- Designing web experiments in JavaScript to support online experiments during pandemic with care of accurate response time data collection.

Research Assistant

BMO AI Lab (Sep 2020 - May 2021)

- Pix2pix real time implementation to convert regular video to an "artistic" video.
- Deep dive into pix2pix's research paper code to adapt for our specific use case and created scripts to automate data collection, pre-processing, training and testing.
- Parallelised pre-processing data to speed up by 24x.

Teaching Assistant

UofT AI (July 2020 - May 2021)

- Worked on the syllabus for the introduction to AI course.
- Created video lectures for remote learning on topics like decision trees, minimax, genetic algorithms, re-inforcement learning
- Hosting office hours and tutorials weekly.
- Mentored 3 AI projects, working with recommendation algorithms and reinforcement learning and K-means clustering.

Software and Vision Engineer
Robotics for Space Exploration (RSX) (Jan 2018 - June 2018)
- Worked on the spacial awareness for the UofT Mars rover. Used Ross Kinetic, and specifically RTabMap for this.
- Used python for object detection, foreground and background differentiation and distance approximation.

EDUCATION

University of Toronto - 2017-2021
Honours in the Bachelor of Science
- Computer Science Specialist focusing in Artificial Intelligence
- Mathematics Minor

Yearly GPA	
CGPA 3.51	
Year 1	3.83
Year 2	2.67
Year 3	3.79
Year 4	3.90

PROJECTS

Neural Network Style-Transfer in Images (May 2020 - Aug 2020)
- Research project including extensive use of image understanding concepts, like scale and rotation invariant feature
  detection, localisation and matching, are used in the framework of a Deep Convolutional Generative Adversarial Network
  (DCGAN) to make the outputs more realistic.
- Researched the performance of Variational autoencoders and Adversarial autoencoders in style-transfer.
- Deep understanding of underlying image structures required to teach a computer to create novel, realistic images.

Algorithmic Trading Project
- Goal is to understand the strengths and weaknesses of various machine learning models by predicting stock prices.
- Use of various deep networks like MLP, CNN, LSTM, etc.
- Use of non-deep machine learning methods like SVMs, Decision Trees with Bagging and XG Boosting, etc.
- Principal Component Analysis to find important technical indicators for stock price prediction.
- Scraping information from Twitter for sentiment analysis for stock price prediction.

Security Drone (Feb 2019)
- Autonomous GPS enabled drone to replace students who escort other students at night across campus.
- Image processing for obstacle and facial detection done on server since something on the drone wouldn't be powerful.
- Arduino flight controller coded from scratch in C#.
- Top 5 finish at MakeHarvard for this project.

Virtual Trainer (May 2018)
- Fitness app to generate unique workouts to target functions and areas of different muscle groups optimally.
- Coded in Swift and Objective C for IOS.
- Use of Clarifai vision API for body type classification for more customised workouts.

HACKATHONS
- MakeHarvard 4th place for autonomous security drone.
- Orbis Challenge top 5 for game winning AI that plays splix.io.
- Elevate Tech Jam - 7th place for IoT Device for WLAN interface for throttling bandwidth, managing data, etc.
- Stanford Tree Hacks.
- Placed top 10 in numerous other hackathons.