# Kunaal Kumar

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## EDUCATION

**The University of Texas at Austin**                                                    Graduation Date: May 2020
    **B.S. Computer Science with Turing Scholar Honors**
    **Economics Minor**
    **Relevant Coursework**: Algorithms, Computer Vision, Artificial Intelligence, Data Mining, Cloud Computing, Data Structures, Computer Architecture, and Operating Systems

## PROFESSIONAL EXPERIENCE

**Faceboook** – *Software Engineering Intern*                                                    May - Aug 2018
- Interning at Facebook next summer.

**Amazon** – *SDE Intern*                                                    Sep - Dec 2018
- Worked on the Network Load Balancing team under AWS EC2.
- Created a resource auditor; the program periodically reads snapshots of all necessary resources at a predetermined interval. By converting all resources into a JSON representation, resources across multiple Amazon regions were compared to make sure that they were in sync. The program collected metrics and issued alarms in the event that errors exceeded a certain threshold.

**Unchained Capital** – *Software Engineer Intern*                                                    May 2018 – August 2018
- Worked as a full stack developer to update, maintain, and add features to their web app.
- Built a backend framework using wkhtmltopdf to extract customer information from the database and automatically generate relevant legal documents.
- Worked on connecting the backend with Twilio in order to increase application security; numerous browser attacks are capable of manipulating bitcoin addresses when served on a webpage. By sending users confirmations of the relevant bitcoin addresses, they can be certain that they're sending money to the correct address.

## PROJECTS

**Algorithms Researcher at Texas Spacecraft Laboratory**                                                    Jan 2018 - Present
Skills*: Python, Tensorflow, OpenCV*
- Worked on a computer vision system for the SEEKER satellite mission, which will launch early next year.
- Tuned Tensorflow training hyperparameters (including adding dropout and L2 regularization) in order to decrease overfitting and decrease the model's false positive rate.
- Extracted features from the image feed in order to characterize which postprocessing methods should be used to contour the satellite and find its centroid. Mainly worked on extracting local binary pattern histograms of each image as a method of categorizing the overall textures present.

**Stock Portfolio Optimization Tool**                                                    Jul 2017
Skills*: Python, Scipy*
- Created a program that uses gradient descent to maximize the Sharpe ratio (maximizes returns adjusted for risk) of a given set of stocks.
- Program takes stocks to be considered as input, initializes a random starting point, and then minimizes the negative Sharpe ratio of the overall portfolio with the constraint that the stock distributions must add up to 1.
- Returns the proportion of each stock that you should buy. Only uses historical data without directly making predictions on the future Sharpe ratios.

**Gyft Chrome Extension**                                                    Sep 2017
Skills*: Javascript*
- Created a chrome extension to save the user money using the following; when people get gift cards they don't want they sometimes sell the cards on third part websites (such as eBay) at a discount.
- The plugin searches eBay for gift cards applicable to current website to effectively give the user free money.

## RELEVANT SKILLS

Programming languages: Java, Python, HTML/CSS/JavaScript, C/C++
Technical Skills/Libraries: Git, React, Bootstrap, Node.js/Express, Heroku

## ACTIVITIES

**Undergraduate Computational Finance Director**                                                    February 2018 - Present
- Give multiple trading strategy pitches each semester based on both fundamental analysis and quantitative signals
- Latest pitch involved analyzing some unconventional volatility signals, including share buybacks, hedge fund positions in commodity futures, and web search interest in a company.
- The responsibilities of one of the directors include handling logistics, ideating trading strategies, and assembling and managing a team to test those strategies.