Param Popat

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Education

- **Columbia University** — New York, NY
  M.S. in Computer Science (GPA: 3.915/4.0) [TA: Computer Vision (Fall 19)] — *Aug 2019 - Dec 2020*
- **Nirma University** — Ahmedabad, IN
  B. Tech in Computer Engineering (GPA: 9.12 / 10.0) [Rank: 3/150] — *Jul 2015 - May 2019*

Experience

- **Dailight Corp (AI Zwei)** — New York, NY
  AI Research Intern — *May 2020 - Current*
  - Developing an AutoML bot with the focus on providing optimized deployment ready solutions to the user. Researching ways to optimize end-user model through Pruning, Twinning, and Quantization and incorporate adversarial robustness.
- **Bosch (Robert Bosch Gmbh)** — Bangalore, IN
  AI Intern — *Jan 2019 - May 2019*
  - Designed flow to test for vulnerabilities in existing Machine Learning systems, including flaws such as Adversarial attacks and Model Stealing.
  - Developed and Patented methods to protect AI systems incorporating Convolutional Neural Networks (CNN), LSTMs, and traditional ML techniques from vulnerabilities. This work opened a new business avenue for Bosch where they provide protection services for ML systems.
  - Developed Recommendation Engine for Hypermarket use-case incorporating active research in Generative Networks and AutoEncoder based Recommendation Engines. Achieved a 70% hit rate in the purchase of products from the items recommended to a user as compared to a pre-existing system giving a 25% hit rate.
- **Canary Mail (Mailr Tech LLP)** — Rajkot, IN
  Intern - Machine Learning — *May 2018 - Jul 2018*
  - Analysed a wide variety of external factors that affect the Indian Stock Market and Engineered Neural Network systems to incorporate the delayed correlation effects between stocks and factors strongly affecting their movement.
  - Developed an Ensemble of Statistical Cross-Correlation, Causal relationships and time-series machine learning models like LSTM to predict a mix of profiteering stocks with their movement 1 week ahead and auto-invest in them. This system gave up to 48% returns over an investment period of 12 months.
  - Evaluated the seasonality in stocks where some escalate in specific periods like holidays and devised a GRU based Neural Network model to investigate prominent seasonality in all the National Stock Exchange, IN listed companies and output an ideal time to invest and divest for optimum profits. Structured an ensemble of seasonality and the effect of external factors on stock, this accelerated the year-over-year returns to 65%.

Projects

- **Predicting The Next-Day Price Movements Through CNN Using Technical Indicators.** Sep 2018
  Keywords : Time Series Data, CNN, Stock Market, Spatial Mapping, Regression
  - Leveraged the uniqueness of multi-sized filter maps over 2D mapping of of Stock's technical indicators, and achieved an average F1 Score of 0.80 in predicting next day's movement. Devised a unique arrangement of indicators in the input 2D mapping that took into consideration the correlation between indicators and their effect on the actual stock.
- **Deep Learning Based Diabetic Retinopathy Detection** Mar 2018
  Keywords : CNN, Diabetic Retinopathy, Tensorflow, Keras, Medical Images
  - Surveyed the state-of-the-art implementations that leverage deep learning techniques to detect diabetic retinopathy (link). Developed a CNN inspired by Inception V3 module which gave an average F1 score of 54% on binary classification and 63% on identifying exudate from the image.
- **Animal / Object Identification using Deep Learning on Raspberry Pi** Jul 2017
  Keywords : Tensorflow, Keras, OpenCV, Inception V3, CNN, Raspberry Pi, Model Compression
  - Developed a light-weight CNN inspired from Inception V3 which achieved a 79% top-5 accuracy at a processing speed of 20 FPS upon Deployment on Raspberry Pi. Published the work in Information and Communication Technology for Intelligent Systems, Springer, 2018

Skills

- **Languages**: Python, SQL, Tensorflow **Tools**: AWS, Kubernetes, Git, Tableau
- **Coursework**: NLP, Cloud Computing, Deep Learning, Algorithms, Databases, Speech Processing

Publications

- **Animal / Object Identification using Deep Learning on Raspberry Pi** Mar 2018
  with Nirma University Computer Science Department
  - Popat P., Sheth P., Jain S. (2019) Animal/Object Identification Using Deep Learning on Raspberry Pi. In: Satapathy S., Joshi A. (eds) Information and Communication Technology for Intelligent Systems. Smart Innovation, Systems and Technologies, vol 106. Springer, Singapore
- **Method to Protect Neural Networks Against Vulnerabilities.** May 2019
  with Robert Bosch Gmbh filed in India, United States, and Germany
  - Inventors: Param Popat, Manojkumar Parmar, Himajit Aithal
  - Patent Application Number: 201941024967