# Rohil Verma

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## Education

**Massachusetts Institute of Technology (MIT)** Cambridge, MA

**B.S. in Computer Science, M.Eng. in Computer Science** (GPA: **5.0/5.0**) *June 2020*

Relevant Coursework: Data Structures/Algorithms, Reinforcement Learning, Generative Adversarial Networks, Deep Learning, Inference, Natural Language Processing, Computer Vision, Computational Biology, Theory of Computation

**NTSE Scholar:** 1/1000 recipients of the National Talent Scholarship from the Govt. of India out of ~1 million candidates

## Experience

**Data Analysis Intern,** *Celect* Boston, MA

Built demand estimation algorithms, forecasting models, and optimization pipelines *May. 2018- Aug. 2018*

- Modelled demand as a Poisson process and built a maximum likelihood matrix completion algorithm in Python; this is now the company's core demand estimation model.
- Forecasted sales with random forest, linear regression, and nearest neighbor models. Improved forecast by 5%.
- Built assortment and choice count optimization pipelines. Predicted profit lift of 13.9%.

**Backend Engineering Intern,** *Airfox* Boston, MA

Deployed backend endpoints and automated Kubernetes deployment testing *Jan. 2018- Feb. 2018*

- Built core functions for account and wallet services in Node.js; enabled account creation and money transfer.
- Automated Docker image deployment to Kubernetes using Bash; reduced testing time from hours to minutes.

**Software Engineering Intern,** *Stone Pagamentos* Rio de Janeiro, Brazil

Built an automated weighing-payment product and an Internet-of-Things software library *May 2017- Aug. 2017*

- Identified business opportunity and constructed a prototype weighing machine integrated with Stone's payment technology through a Raspberry Pi.
- Used C#/Mono on the RPi running Raspbian Jessie Linux, to automatically weigh plates of food and charge customers for purchases - the product was sold to restaurants and grocery stores that sold food by weight.
- Designed and built a software library in Python that provided a high level interface for IoT devices using the MQTT communication protocol and TCP.

## Projects

- **Unsupervised pre-training in reinforcement learning:** Compared utility of perceptual and curiosity-driven pre-training. Found that neither reliably speeds up training, but may direct agent towards better policies.
- **Music generation using RNN:** Trained an RNN to generate 30 second music clips using pop songs as training data.
- **Search for subtypes of Alzheimer's:** Using RNAseq and methylation data, constructed similarity matrices; applied similarity network fusion; searched for clusters, testing agglomerative, ward hierarchical, spectral clustering and affinity propagation; evaluated results using silhouette score and adjusted NMI/Rand score.
- **Detection of GC-rich regions and CpG islands:** Trained Hidden Markov Models on full chromosomes to detect CpG islands (8 states) and GC-rich regions (2 states) within a genome; improved model by training on unlabelled data (Baum-Welch unsupervised learning).

## Peer-reviewed Publications

- **R Verma**, S Kim, D Walter. **Syntactical Analysis of the Weaknesses of Sentiment Analyzers**. Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing. In press.

## Skills

**Programming Languages:** Python, Node.js, Java, C#, Bash, R; **Techniques:** IoT, network security, hardware, web

**Tools:** pandas, scikit-learn, tensorflow, keras, Linux, Git, Docker, Kubernetes; **Languages:** Hindi, Spanish