

# ADITYA CHINDHADE

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## EDUCATION

**Carnegie Mellon University** | Pittsburgh, PA December 2018 (expected)  
*MS (Research) Chemical Engineering (Focus on **Machine Learning** and **Mathematical Optimization**)* | GPA: 3.62/4  
**Relevant Coursework:** Data Structures and Algorithms | Java Programming | Computational Methods (Optimization) | Mathematical methods | Computer Science in ChemE (Fortran and GPU programming) | Graduate Machine Learning (10-601)\* | Computer Systems (15-513)\* | Machine Learning\*\* | Data Science\*\* (\*=audit, \*\*=mooc)

**Birla Institute of Technology and Science (BITS)** | Pilani, India May 2017  
*BE (Honors) Chemical Engineering* | GPA: 8.59/10

**Relevant Coursework:** C and Shell Programming, Probability and Statistics, Numerical Methods for engineers.

## SKILLS

**Languages:** Python, Java, R, MATLAB / Octave, Fortran, C, HTML, Scala, C++, JavaScript (Node.js), XML.  
**Data science libraries:** Sklearn, Keras, PyTorch, TensorFlow, Weka, Caret, Pandas, Ggplot2, Seaborn, Matplotlib.  
**Distributed frameworks:** OpenMP, MPI, OpenAcc, CUDA, Hadoop, Spark, Kafka, AWS, Google Cloud.  
**Databases:** MySQL, SQLite, PostgreSQL, Oracle, DynamoDB, MongoDB.

## PROFESSIONAL EXPERIENCE

**CMU - Sahinidis Optimization Group** | *Research Assistant (Machine Learning)* Spring 2018 - Present

- Benchmarked feature selection techniques like the group-lasso and elastic-net with non-linear optimization solvers.
- Achieved 10% improvement in accuracy with ALAMO, an integer programming tool, while preserving interpretability.
- Implemented the group-lasso regularization for a 4-layer deep network, a deterministic equivalent of the Dropout, thereby making the network sparser by 65% and enabling significant speedups for predictions on the trained network.

**Harvard-MIT HST Division, Cambridge MA** | *Summer Intern (Statistical Analysis)* Summer 2016

- Extracted, cleaned and visualized spectroscopy data and built a predictive model for biological drug release in R.
- Identified key molecules influencing drug activity using full-factorial analysis-of-variance (ANOVA) on Minitab.

## PROJECTS

**Natural Language Processing (NLP) for Electronic Health Records** | NCI Cancer Registry Summer 2018

- Built a custom bag-of-words from medical ontologies and trained an ensemble of models such as Naive-Bayes, Logistic Regression and Random Forests to achieve an accuracy of 94.09 % and F-score of 0.936.
- Contributed to the deployment of a Flask-based web-app for cancer classification on Google Cloud Platform.

**Mini Siri - A text-based personal assistant** | CMU Machine Learning Spring 2018

- Developed a named-entity-recognition (NER) tagger for identifying flight information from natural sentence input.
- Improved accuracy by 15% using context-based continuous bag-of-words (CBOW) against single-word representation.

**Machine Learning for identification of Sleeping Brain Disorders** | CMU Auton Lab | Philips Spring 2018

- Implemented a sliding-window approach for feature selection on 22 Gigabytes of EEG data on a supercomputing cluster, trained a classifier for predicting occurrence of irregularities in sleep patterns and visualized ROC.
- Publication:** Chindhade, Aditya, et al. "A machine learning model for identifying cyclic alternating patterns in the sleeping brain." arXiv preprint arXiv:1804.08750 (2018).

**Neural Networks for mapping Neuron Firing to Physical Motion** | CMU BrainHub | Google Summer 2018

- Performed exploratory data analysis to illustrate the difference in neuron activity between the Cortex and Striatum.
- Trained a multi-layer perceptron to predict movement from neuron activation data with an accuracy of 92.22%.

**Modeling and Prediction of historic Presidential elections** | Data Science Summer 2018

- Scraped poll-data from public domain and parsed HTML code to extract candidate approval ratings over time.
- Computed and visualized winning probabilities for candidates and provided uncertainty estimates using bootstrap.

**MovieLens Recommender System** | Machine Learning Fall 2017

- Generated and visualized personalized movie recommendations for users based on a dataset of 100k movie ratings.
- Implemented the collaborative filtering algorithm from scratch and trained it using the conjugate gradient optimizer.

**First-order optimization methods for Deep Learning** | CMU Optimization Fall 2017

- Trained a 7-layer deep Convolutional neural network (CNN) on 60,000 grayscale images using Keras and TensorFlow.
- Benchmarked first-order gradient methods such as SGD w/o momentum, Adam and AdaDelta with various batch sizes to conclude that fastest convergence was obtained with AdaDelta while highest accuracy was obtained with SGD.

## ACHIEVEMENTS AND LEADERSHIP

- Recipient of the Insight Data Engineering fellowship, which involves hands-on training on building scalable data pipelines.
- Led a team of five graduate students to win the **first prize** in CMU HackAuton, a hackathon sponsored by Philips.
- Worked in an team of engineers, doctors, and a professor to win **third prize** at NAACCR Informatics Hackathon.