Akhilesh Sanjay Somani

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Education

University of Illinois at Urbana-Champaign (UIUC) Aug 2019 - May 2021
Master of Science in Mechanical Engineering **GPA: 3.91/4.0**

Indian Institute of Technology (IIT) Bombay Jul 2015 - Aug 2019
Bachelor of Technology in Mechanical Engineering; Minor in **Computer Science & Engineering** **GPA: 9.16/10**

Skills and Languages

Skills: Data Science and Analytics, Machine Learning, Statistics, Operations Research

Languages/Software: Python, MATLAB, SQL, R, Anaconda, Keras, Scikit-learn, Kubernetes

Technical Experience

- **Data Science Intern**, Corteva Agriscience May 2020 - Aug 2020
  - Predicted transgene expressions in genetically engineered corn to save time & money spent on greenhouse experiments
  - Ideated and formulated strategies to transform data to accurately capture underlying biological phenomena
  - Achieved prediction r^2 scores of **0.75** by systematically implementing various statistical tools (**linear regression, regularization methods**) & ML models (**decision trees, ensemble methods, KNN, neural networks**)
  - Developed an interactive **R-Shiny dashboard** as a front-end to the ML-based prediction model to assist biologists
  - Used **Kubernetes** to deploy and run deep learning models on the GPU cluster for faster execution
- **Experimental Data Analyst Intern**, University of California at Berkeley May 2017 - Jul 2017
  - Conducted experiments to capture data for nanoscale protrusions (~10 nm) of control resistors on hard disk drives
  - Performed data cleaning, transformation, visualization & analysis (using MATLAB) to derive linear relation between protrusions and power input of the resistor

Key Projects

- **Data Driven Temperature Control of novel Heat Exchanger (HX)**, UIUC Aug 2019 - present
  - Spearheading a team of 5 while collaborating with 4 research groups to develop a hybrid heat exchanger (HX)
  - Building experimental setup to gather sensor data, perform data analysis, & monitor HX's real-time performance
- **Quantitative Analysis of Stock Market**, UIUC Jan 2020 - May 2020
  - Accomplished feature engineering, PCA, LDA, and clustering for automated sector-identification of S&P 500 stocks
  - Programmed Keras LSTMs to attempt to predict future prices (recognizing major flaw in methodology on the internet)
- **Unsupervised Stool Sample Analysis in Hepatic Encephalopathy**, UIUC Jan 2020 - May 2020
  - Studied stool sample data for liver cirrhosis patients to analyze & predict the microbes responsible for brain damage
  - Constructed **Bayesian Networks** (from scratch using core concepts of local Markov property) to pre-process data
  - Performed dimensionality reduction (PCA) & clustering using **KMeans, GMM, Hierarchical clustering** to successfully identify & study taxonomical relations between 20 abnormal microbes (out of 150)
- **Data Analytics in High-Performance Computing Security**, UIUC Jan 2020 - May 2020
  - Predicted the likely states of multi-stage attacks using **Hidden Markov Models** and **Factor Graphs**
  - Parsed the raw data from network packets into analysis-friendly format using Pyshark
  - Identified attacker info (IP address, DNS server, etc.) & analyzed their activity to study the progression of the attacks
- **Autonomous Vehicle (AV) Safety Analysis**, UIUC Jan 2020 - May 2020
  - Performed statistical testings to compare AVs' performance results with human drivers, predicting an accident probability of 213 times higher, implying AVs not yet ready for large-scale deployments
  - Developed Naive Bayes Model (from scratch) to predict, with 80%+ accuracy, causes of failure under various conditions

Relevant Courses

Data Science & Analytics, Data Mining, Machine Learning, Data Science in Quality Control, Data Analysis & Interpretation