Akhil Vasvani
New York, NY
GitHub, LinkedIn, HackerRank,
DataCamp, Kaggle

Interests

AI, Deep Learning,
NLP, CV, Big Data,
Opensource software

EDUCATION

Johns Hopkins Whiting School of Engineering   **Baltimore, MD**
Master of Science in Electrical Engineering (GPA: **3.5/4.0**)   December 2018
- **Relevant Coursework:** Data Mining, FPGA, Machine Learning Signal Processing, Wavelets and Filter Banks, Random Signal Analysis, Compressed Sensing, Statistical Pattern Analysis, and Audio Signal Processing

Bachelor of Science in Electrical Engineering   May 2017
- **Relevant Coursework:** Introduction to Java, Intermediate Programming, Calculus III, Linear Algebra, Probability and Statistics, Digital Systems Processing, Electronic Design Lab, and Signals and Systems

MIT Opencourseware   **Brooklyn, NY**
- **Trained in:** Digital Signal Processing   June 2017 – August 2017

Trinity School   **New York, NY**
High School Diploma   May 2013

Universitat Autonoma de Barcelona   **Barcelona, Spain**
Study Abroad Program   July 2011
- **Relevant Coursework:** Intense program in Spanish

University of Oxford   **Oxford, United Kingdom**
Study Abroad Program   July 2010
- **Relevant Coursework:** Intense program in World Economics

WORK EXPERIENCE

Rebellion Research   **New York, NY**
Researcher   September 2019 – Present
- Assisted in research for sound source localization via increasing efficiency in current technologies by 20%, which led to publishing content on the company website

Intel Corporation   **Bangalore, India**
Graduate Technical Intern   June 2018 – September 2018
- Accomplished augmenting and expanding speech databases by implementing Generative Adversarial Networks (GANs) which led to scaling 2,000 sentences to more than 10,000 sentences
- Integrated BLEU score metric, to determine accuracy of generated sentences, ranging from 0.7 - 0.9
- Upgraded dCNN and BiLSTM networks for cross-domain context aware spoken language understanding (SLU)

NBM Technologies, Inc.   **Hampden, MD**
Intern   June 2016 – January 2017
- Key idea generator and executor of plan to solve problems identifying locations and assessing the magnitudes of structural defects in bridges for Norfolk Southern
- Identified the appropriate 3-D point cloud comparison open source photogrammetry software suitable for time evolution
- Successfully tested proof of work concept using photographic images on hand

Health Solutions Plus (HSP)   **Melville, NY**
Intern, Developer Team   June 2015 – August 2015
- Scaled input for up to 10,000 clients in one go via creating a specific batch loader on the back end—a patch—that expanded database for healthcare insurance back office needs using MySQL
- Upgraded code for user interface on the front end of HSP's software by expanding the notes option to allow for additional specifics during input, which more than 60% of providers enjoyed

Sylvan Learning Center   **Brooklyn, NY**
Tutor, Sylvan Learning   June 2014 – August 2014
- Tutored high school students in high school mathematics and Physics, which led to 60% increase in regents test scores
- Led students in SAT and ACT preparation, which helped increase their scores to reach the upper 80th percentile

Mahindra Reva (Electric Car Company)   **Bangalore, India**
Intern, Developers   June 2013 – August 2013
- Using Google API's, programmed JAVA code for text message-to-speech capability for the REVA e2o car

DynaScan Inspection Systems   **Bangalore, India**
Intern, Designer Team   March 2010 – August 2010
- Using AutoCAD, assisted in developing models for production use

PERSONAL PROJECTS

[Heart Sounds Classification](#)   **New York, NY**
Developer   April 2019 – Present
- Conducted further research in master's thesis project to classify heart sounds into normal or abnormal categories by implementing a BiLSTM network, which led to a 98% accuracy in predicting heart valve failures

[Artificial Haitian Creole Language Database](#)   **New York, NY**
Developer   January 2019 – April 2019
- Developed a high-volume and large-scale synthetic sentence database utilizing LeakGAN in TensorFlow by gathering an open-source Haitian Creole sentence dataset
- Improved sentence quality by more than 20% from applying Frechet InferSent Distance metric

ACADEMIC PROJECTS

[Sound Source Localization Analysis in a Reverberant Environment](#)   **Johns Hopkins University**
Masters Thesis Project   September 2018 – December 2018
- Collaborated in Professor Andreas G. Andreou's research lab to detect S1 and S2 sounds in the human heart
- Updated data streamlining process by applying Independent Component Analysis (ICA) to divide large EKG datasets into subsets of S1 and S2 heart sounds, resulting in a 40% time reduction
- Unit-tested a variety of time distance of arrival methods to identify best methods of locating sound sources in a reverberant environment
- Designed a multithreaded and distributed system and implemented the aforementioned best methods on subsets to further accurately identify S1 and S2 heart sound locations within an area of 3 square millimeters

[Determination of Features that Contribute to High Gross Box Office Earnings](#)   **Johns Hopkins University**
Data Mining Final Project   October 2018 – December 2018
- Developed a regression model to predict which features contribute to a movie grossing more than 100 million dollars
- Predicted success of *Vice* and *Mary Poppins Returns* with 95% accuracy prior to release dates

Robust EMG Classification Using Sparse Recovery   **Johns Hopkins University**
Compressed Sensing Final Project   March 2018 – May 2018
- Modified several sparse recovery algorithms to improve classification of limb positions from electromyography (EMG) signals in real-time using dictionary compression, which decreased runtime by almost 70%

Relationship between Sparse estimators and the Correct Selection of Variables   **Johns Hopkins University**
Statistical Pattern Analysis Final Project   March 2018 – May 2018
- Explored the motivation that better model selection can be achieved with the cost of more bias on the parameter estimates
- Investigated for a one-dimensional case that though Bayesian Information Criterion (BIC) will give a better choice to recover the correct location of the non-zero elements, Akaike Information Criterion (AIC) will yield a higher power in test
- Proved that the Mean Square Error (MSE) of the BIC was greater than the MSE of the AIC

[Speech to Image](#)   **Johns Hopkins University**
Machine Learning Signal Processing Final Project   October 2017 – May 2018
- Built a robust pipeline with open-source speech-to-text deep learning engine DeepSpeech and text-to-image StackGAN v1 algorithm using TensorFlow, which enabled users to create an image via voice commands
- Outperformed 80+ students in Machine Learning for Signal Processing class at Johns Hopkins for the best presentation
- Decreased Word Error Rate by 1% implementing TensorRT, which improved the accuracy of DeepSpeech

Using Discrete Wavelet Transform on the S&P500   **Johns Hopkins University**
Wavelets and Filter Banks Final Project   October 2017 – December 2017
- Designed and implemented a modular, extendable, and maintainable discrete wavelet transform to the prior year's S&P500 price time series to model data to as a "smooth" polynomial curve
- Accomplished predicting prices by implementing an Artificial Neural Network (ANN) decision maker, which in comparison to the real prices led to 15% improved performance when using the wavelet transform model
- Automated an accuracy report to help continually modify our model

Detecting Animals with Action Recognition without a Camera   **Johns Hopkins University**
Project Manager of Senior Capstone Project   August 2016 – May 2017
- Created miniature prototype that detects animals using ultrasonic signals via designing a new schematic of an existing 2008 model using PCB Artist, which led to streamlining extraneous parts and implementing a new microprocessor (PIC Board) for faster use
- Upgraded existing MATLAB code via implementing a semi-supervised learning method, a conditional random field (CRF) clustering model, to correctly identify animals based on their ultrasonic signal

Smart Weather Umbrella   **Johns Hopkins University**
Team Leader of Electronic Design Lab Final Project   January 2016 – May 2016
- Built a wireless smart umbrella stand that lights up on the onset of inclement weather and reminds the user via text message if it remains untouched

Tech Skills

Programming Languages	**Machine Learning Frameworks & Libraries**
Python, C, C++, MATLAB, Java	TensorFlow, PyTorch, MXNet, Keras, Scikit-learn, spaCy, NLTK

Python & Data Visualization Libraries	**CUDA Libraries**
NumPy, SciPy, Pandas, XGBoost, PySpark, CuPy, matplotlib, Seaborn, OpenCV	TensorRT

DevOps & Databases	**Other Skills**
UNIX/Linux, Git, Kubernetes, MySQL, NoSQL	AutoCAD, PCB Artist, PhotoScan, VHDL

Languages: Conversational Proficiency in Spanish and introductory knowledge of Hindi
Sports: Represented Johns Hopkins University Club WaterPolo for four years