

VEENA VIJAI

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EDUCATION

University of Southern California

Los Angeles, CA

Master of Science in Electrical Engineering, GPA: 3.82/4.0

January 2019 – December 2020

Awarded [MS Honors Fellow](#) for exceptional academic performance and active involvement in research.

Birla Institute of Technology and Science, Pilani

Goa, India

Bachelor of Engineering in Electrical Engineering, Minor in English Studies, GPA: 8.36/10

August 2014 – May 2018

EXPERIENCE

Applied Scientist Intern | Amazon Lab126, Bellevue, WA [ONNX, TensorFlow, Keras, C]

May 2020 – Aug 2020

- Studied capabilities and limitations of Amazon's **Neural Network Accelerator** (NNA) for audio applications
- **Modified existing model architectures** for compatibility with Open Neural Network Exchange (ONNX) format
- **Facilitated ~20 cross-team discussions** and documented experiments to improve quantized model performance
- Added new **machine learning-based** speech enhancement module to existing **audio front-end** in C code

Research Intern | Signal Analysis and Interpretation Lab, Los Angeles, CA [Python, NLTK]

February 2020 – present

- Mapped Google's **AudioSet taxonomy** to annotated subtitles from top-grossing Hollywood movies
- **Crowd-sourced & cleaned** MTurk annotations for source, sound & quality, for 650 commonly occurring subtitles
- Visualized **word2vec** embeddings & **vggish** features with t-SNE for movie subtitles & corresponding audio events

Research Intern | Cornell Lab of Ornithology, Ithaca, NY [Python, pandas]

July 2018 – December 2018

- Automated sifting through years' worth 24/7 acoustic data by picking regions likely to contain bird calls ([blog](#))
- Extracted 5 acoustic features and **classified ~3000 spectrograms** from 30 species with rule-based approach ([repo](#))
- **Collaborated remotely** (10.5 hr difference) with postdoc mentor and **effectively communicated** ideas & updates weekly

Research Intern | Indian Institute of Science, Bengaluru, India [MATLAB, Praat]

1. Speech Segmentation

May 2017 – December 2017

- Extracted 3 acoustic features with time & frequency-domain information from TIMIT clean speech ([thesis](#))
- Segmented clean speech into **silence, sonorants, fricatives & bursts** with **rule hierarchy** to deal with confused regions

2. Visualizing Language Relationships

May 2016 – July 2016

- **Modeled phoneme sequences** in 5 Indian languages and English using varying-distance bigram MFCC features ([paper](#))
- Applied **k-medoid clustering** on MFCC features & constructed **phylogenetic trees** to visualize language relationships

SELECTED PROJECTS

Garfield Comic Strip Generation [PyTorch]

October 2019 – December 2019

- **Generated images and dialog** for the third panel of Garfield using previous two panels as 'context' with **PyTorch** ([blog](#))
- Achieved best results with **Conditional GAN pix2pix**, and evaluated with Frechet Inception Distance
- Fine-tuned **OpenAI GPT-2** to generate dialog, also experimented on **transformers & LSTMs** with **attention**

Room of Requirement: Room Impulse Response Similarity Calculator [pyroomacoustics, scipy, pandas]

May 2020

- **Designed & created dataset** of ~500 rooms with varying shape, size & absorption coefficient ([repo](#))
- Predicted top 3 similar rooms wrt RIR & observed frequency response patterns with varied size and absorption coefficient

Others: Time series classification on AReM sensor data, Self-driving car competition with PID control ([repo](#))

TECHNICAL SKILLS

Programming: C++, Python, C, MATLAB, bash, git, Jupyter

Frameworks/Libraries: TensorFlow, PyTorch, Keras, sklearn, NumPy, pandas, matplotlib, seaborn, ONNX, NLTK, spaCy

Coursework: Mathematical Pattern Recognition, Deep Learning, Probability & Statistics, Linear Algebra, Data Structures & Algorithms, Optimization for Data Science, Immersive Audio Signal Processing, Speech Recognition

LEADERSHIP & INITIATIVES

- **Chief Editor** of BITS Annual Magazine: **led a team of 10** editors & designers to publish first bilingual edition ([issue](#))
- **Coached** underprivileged Indian students in arithmetic for 2 years in Nirmaan Goa for the JNV scholarship exam ([blog](#))
- **Mentored** 7 international graduate students at USC to acclimatize and thrive in a new academic environment