

# Jaswanth Reddy Katthi

📞 +91 8328459325 • ✉️ jaswanthayrus@gmail.com • 🌐 jaswanthayrus.me

## Education

- **Indian Institute of Science** **Bengaluru, India**  
*M.Tech (Res), Machine Learning and Signal Processing, EE* *2018–2021*  
Courses: Machine Learning for Signal Processing, Speech Information Processing, Time-Frequency Analysis, Compressed Sensing and Sparse Signal Processing, Data Analysis and Visualization, Matrix Theory, Linear and Nonlinear Optimization, Stochastic Models and Applications, Advanced Deep Learning, Data Structures and Algorithms.
  - **Thesis: Deep Correlation Analysis for Audio-EEG Decoding** **Prof. Sriram Ganapathy**  
Proposed deep learning framework, for intra- and inter-subject analyses, that significantly improves over the linear methods (TRF & CCA) for single-trial audio-EEG stimulus-response correlation analysis. It alleviated the effect of substantial noise prevalent in the EEG data. Also examined reconstructing the auditory stimuli purely from their EEG responses.
- **Jawaharlal Nehru Technological University, Anantapur** **Anantapur, India**  
*B.Tech, Electronics and Communication Engineering* *2013–2017*  
Courses: Data Structures, Signals and Systems, Analog and Digital Communications, Digital Signal Processing, Calculus
  - **Final Project: Smart Automotives using MSP430**

## Research Interests

Language Technologies, Machine Learning, Perception, Neuroscience, RL, CV, Control and Cognition.

## Publications

- **Deep Correlation Analysis for Audio-EEG Decoding**, *Jaswanth Reddy Katthi and Sriram Ganapathy*, IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE) 2021. (**Journal**)
- **Deep Multiway Canonical Correlation Analysis for Multi-Subject EEG Normalization**, *Jaswanth Reddy Katthi and Sriram Ganapathy*, IEEE ICASSP 2021. (**Conference**)
- **Deep Canonical Correlation Analysis For Decoding The Auditory Brain**, *Jaswanth Reddy Katthi, Sriram Ganapathy, Sandeep Kothinti and Malcolm Slaney*, IEEE EMBC 2020. (**Conference**)

## Research Experience

- **Reconstructing speech stimuli from EEG Recordings** **Prof. Sriram Ganapathy**  
*Department of Electrical Engineering, Indian Institute of Science* *Spring 2021*  
Studied various deep learning models like CNN, LSTMs and transformers for reconstructing speech stimuli from their corresponding EEG responses in the single-trial analysis setting.
- **Latent representation of Hi-C intra-chromosomal interactions** **Kevin D'Souza**  
*ECE, The University of British Columbia* *Fall 2020*  
Deployed variational LSTMs for modelling the latent 3D intra-chromosomal interactions from a Hi-C contact matrix.

## Work Experience

- **Qualcomm** **Hyderabad, India**  
*Camera Systems Engineer* *May 2021–Oct 2022*  
Working on incorporating Deep Learning models into the image preprocessing pipeline. Worked on improving the algorithms for chromatic aberration and blooming correction, HDR. Got exposed to NEON, DSP, and SVE instruction sets.
- **Smaya (Startup)** **Anantapur, India**  
*AI features and UI Chief* *2015–2017*  
Our aim was to develop a wearable smart assistant (like a smart watch). Worked on integrating smart features like speech recognition, designed an adaptable and fresh UI based on circles, and actively involved in the overall design of the device.
- **Robolabs** **Anantapur, India**  
*Intern* *2016*  
Participated in multiple embedded systems projects. Notably, I have worked on design and implementation of a coin based mobile charging point which looked similar to a pay-and-talk telephone.

## Projects

---

### Course Projects.....

- **Change-Point Detection and Estimation of Piece-wise Constant Parameters using Sparse Linear Regression** Prof. K.V.S Hari  
*Compressed Sensing and Sparse Signal Processing, IISc* Spring 2019
- **Spectral Offline Clustering for Speaker Diarization with LSTM** Prof. Prasanta Kumar Ghosh  
*Speech Information Processing, IISc* Spring 2019
- **Which factor correlates with the crime rate in India?** Prof. Phaneendra K. Yalavarthy  
*Data Analysis and Visualization, IISc* Spring 2019

### Other Projects.....

- **Biologically Inspired Optimization and Learning**, Neuromatch Academy 2020 Prof. Edward Kim
- **Telebot**, JNTU Anantapur 2016 Prof. E. Keshava Reddy
- **Artificial Intelligence Development Board**, JNTU Anantapur 2016 Prof. E. Keshava Reddy

### Personal Projects.....

- Built a **Facial Keypoints Detector** that predicts the 68 keypoints on each face using CNNs & Haar Cascades.
- An **Image Captioning System** using CNNs, attention and LSTMs, trained and validated on the MS COCO dataset.
- Implemented **SLAM** using kalman filter, and particle filter **for localizing a robot in a 2D grid** world.
- **Finding Lane lines** and **Advanced Lane Finding** using Canny edge detection, Hough transforms, Camera Calibration, and perspective transforms which can detect lanes even on a curved road.
- **Traffic Sign Classifier** using a Le-Net CNN on German Traffic Signs Dataset.
- Implemented **Behaviour Cloning** model, using an 11 layer CNN model, which clones a user's driving pattern.
- **Language Technologies**  
**Sentiment Analysis** (used word2vec, GloVe); **Neural Machine Translation** with Attention; **Emojify**; Modify word embeddings to **reduce gender bias**; **Writing like Shakespeare** using LSTMs; **Trigger word Detection** in Speech Recognition; **Generating Jazz** using LSTM.
- **Images**  
**Neural Style Transfer**; Face **Emotion Detection** using tensorflow; Residual Networks for **Sign Language Classification**; YOLO for object detection; Face Recognition and Face Verification using Triplet Loss.

## Technical and Personal Skills

---

- **Programming Languages:** Python, MatLab, C, C++, Embedded C, HTML, CSS, JavaScript, Bash.
- **Frameworks/ Libraries:** Pytorch, Scikit, Librosa, Keras, Tensorflow, NLTK, SpaCy, Praat, NEON Intrinsic, React.
- **Technical Knowledge:** Speech Processing, Computer Vision, Natural Language Processing, Computational Neuroscience, Reinforcement Learning, Arduino, Energia, Raspberry, UNIX, Git.
- **Other:** Adobe Photoshop, Illustrator, Audition, Premiere Pro, Logic Pro X.
- **Human Skills:** Teamwork, Leadership, Patient Listener, Time Management, Event Management.
- **Languages:** Telugu, Hindi, English, Kannada, Tamizh, Malayalam and French (currently learning).

## Other Activities

---

- Professional Mentor at JNTUA's Skill Development and Incubation Centre (2021 - Present)
- Teaching Assistant for Deep Learning (CCE Course) and E9:309 Advanced Deep Learning (IISc, 2020)
- Career Guidance and Tutoring (Online and Offline, Part-time) (2014 - Present)
- Presented a talk for IEEE-IISc Communications Society & Signal Processing Society Chapters
- Secured an All India Rank of 68 (99.9 percentile) in GATE (EC) 2018.
- Acquired a score of 220/360 (99.5 percentile all over India) in JEE MAINS 2013.

## Extra-Curricular Activities

---

- Theatre Club (Rangmanch), IISc Bengaluru, 2020
- One of the winners in the best sci-fi story competition, organized by Telugu Sahitya Samithi, IISc - 2020
- Elected coordinator for NSS and student body, ECHO Anantapur, 2015-2017
- Co-founder of NGO, Pravartak, that focuses on improving resources for local underrepresented school students. 2016