# Sai Ravi Teja Gangavarapu

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## EDUCATION

**Mahindra University** **Aug 2020**
*B.Tech, Computer Science and Engineering* *Hyderabad, IN*
**University of Florida** **Jan 2024**
*Senior Certificate Programme, CISE Department* *Gainesville, FL*
**Kennedy High The Global School** **Mar 2020**
*A-Levels - Maths, Physics and Chemistry(AAB grades)* *Hyderabad, IN*

## WORK EXPERIENCE

**Catalog** **Apr 2023 – Present**
*SDE Intern* *Hyderabad, IN*

- Found efficient ways to fine-tune LLMs (Llama&BERT) and train a custom NER model by parallelly generating training datasets using LLMs. Goal was to map user input to a specific API endpoint by finding the parameters.
- Implemented a real-time big-data analytics program utilizing FastAPI and MongoDB to observe crypto token volume, facilitating data-driven insights. Also, developed and deployed a dashboard to monitor **wbtc.garden**
- Built a robust leaderboard and deterministic reward system to reward each user based on their txs and worked on atomic swaps using Golang, and Postgresql and deployed on AWS EC2 instances for wbtc.garden **.**

**Mahindra University** **Oct 2022 – Present**
*Research Assistant* **|** *feature extraction, signal processing, evolutionary algorithm, python, OOP* *Hyderabad, IN*
To Automatically create Emotion inhibiting Musical Compositions using AI (Mentor: Dean of Research and HOD)

- Performed **feature extraction** to find mathematical audio features that show divergence across Emotions.
- Developed efficient pipelines for audio feature extraction for the fitness function of an evolutionary algorithm.
- Applied a custom evolutionary algorithm to determine amplitude and phase values in the Fourier transform equation, aiming to generate emotion-specific sounds. Utilized signal processing techniques.
- Integrated self-organizing maps and fuzzy c-means clustering into the fitness function for improved EA.
- In addition, submitted an IEEE Engineering & Transactions journal on utilizing deep learning to uncover economic insights from E-Commerce sites. (Utilized semantic clustering and Bayesian networks)

## PROJECTS

**Song Similarity Using Unsupervised Deep Learning**

- The goal was to explore different methods for song similarity and optimize for accuracy.
- Employed an optimized ALI GAN model by autoencoding noise vectors rather than data items, reducing mode collapse. Then, generated embeddings for song representations in Classical music
- Conducted clustering analysis using the generated embeddings and compared the results with PCA embeddings.
- Visualized the clustering performance through t-SNE plots, providing insights into the effectiveness of the GAN model in capturing song similarities.

**Project RECON:** Raspberry Pi Engineered Cluster Over Net **|** *Distributed Systems*

- To provide an accessible and practical distributed computing platform for students.
- Setup and worked on an Octa Raspberry Pi 4B Compute Cluster. Involves configuration of VLANs, GlusterFS for distributed storage, Slurm with OpenMPI for Parallel Computation and LDAP for cross-node user authentication.
- The Project was funded $2000 by the university. It is being used by over 400 students for coursework.

**Smaller Projects |** *Tensorflow, ML, blockchain, Python, vue.js*

- Designed and implemented an LSTM-based music generation tool using Tensorflow v2.0, preprocessing data, developing a recurrent neural network, and generating coherent piano music in MIDI format.
- A blockchain implementation from the ground up. Music-based interactive to-do list site.
- RSA-based end-to-end encrypted chat room using sockets.

**RateMUProfessors Site |** *React.js, Software Architecture, MongoDB, FastAPI, node.js*

- Designed and and built a full-stack web application with an Authentication system, from the ground up.
- Students could provide feedback, reviews and ratings on courses and instructors.
- The backend is made to be scalable and involves load balancing, rate limiting and jwt authentication.
- It includes past exam papers specific to courses, and we achieved a 10 for the project in the SWE course.

**Gas Monkeys Racing Electronics Team Member (BAJA SAE) |** *IOT, Raspi Pico*

- Worked on Data Acquisition using various sensors such as Accelerometers, RPM sensors, etc
- Used i2c to gather data from all sensors. Made a custom circuit to gather Engine RPM from the spark plug.
- Displayed critical info such as speed, no. of laps, etc on an LCD display for driver's convenience.
- Efficient wiring of all electrical and electronic components such as Engine kill switch, brake lights, headlights, fog lights and horn.

**Audio Reactive Visuals with Nvidia StyleGan |** *Tensorflow, CUDA, Docker*

- Deployed a custom StyleGAN3 model on NVIDIA's DGX-1 with 8 V100s to train over 5 days for DJ set background visuals.
- Scraped 10000s of landscape images from different sites. Implemented transfer learning between Landscape and Flower models. Applied LibROSA to synchronize visuals based on spectral audio features.
- Produced generative visuals making memorable audio-visual experiences during my DJ set.

## CORE COURSES, CERTIFICATIONS, SKILLS & INTERESTS

- **Core courses**: DS, Algorithms, HPC, Distributed Systems, MPI, Cryptography and Network Security, ML, Deep Learning, NLP, Computer Networks, Big Data and DBMS
- **Certifications:** ACM workshop(HPC and AI computing, IIT Palakkad), Exchange student at UFL (Jan-May24)
- **Languages:** C, C++, PYTHON, GoLang, JS, GDScript, Bash, nasm
- **Tools:** Linux, Git, React.ts, express.js, Docker, OpenMP, Postgres, Raspberry Pi, PyTorch
- **Interests:** High-Performance Computing, Deep Learning Research, Music Production, DSA
- **Spoken Languages:** English, Telugu, Hindi
- **Extra Curriculars:** President at **Enigma**, the computer science club, fostered a community to inspire and instil passion in 2500 individuals for the field. Also led the music team for 3 different films as a music director.

## ACHIEVEMENTS

**First Place,** Talentmapp Hack4Hire Hackathon (400 participants) **|** *MongoDB, flask, React.js, ChatGPT* **Mar 2023**

- Built a task-tracking application that enables users to add tasks, set deadlines, assign priorities, and receive reminders for pending tasks.
- Leveraged GPT-3 to provide users with intelligent task suggestions based on their previous activity.
- I led the team, designed the application's architecture, assigned specific tasks to each member, programmed the complete secure backend, including the API and NoSQL database, and deployed it in 8 hours.

**First Place,** Noderunner Hackathon at Catalog (50 teams) **|** *flask, multithreading* **Mar 2023**

- Built a cluster of nodes that automatically communicate with each other and participate in the raft consensus protocol from scratch within 24 hours. Utilized multithreading for efficient communication between nodes.

**Finalist** in the NVIDIA student ambassador program.