

# Sai Ravi Teja Gangavarapu

sairaviteja170603@gmail.com ❖ (+91) 7075001511 ❖ github.com/FloareDor ❖ Hyderabad, IN

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## EDUCATION

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### Kennedy High The Global School

*A-Levels - Maths, Physics and Chemistry(AAB grades)*

**Jun 2018 - Mar 2020**

*Hyderabad, IN*

### Mahindra University

*B.Tech, Computer Science and Engineering*

**Aug 2020 - May 2024**

*Hyderabad, IN*

### University of Florida

*Senior Certificate Programme, CISE Department*

**Jan 2024 - May 2024**

*Gainesville, FL*

## WORK EXPERIENCE

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### 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. The 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

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### 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.

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

- Designed 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.

### **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. Sentiment Analysis of Ukraine's President During War.

### **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**

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- **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**

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### **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.