SAI SRI TEJA KUPPA

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Education

Indian Institute of Technology, Madras **2023 - 2025**
MS in EE, Specialization in Computer Vision and AI. *CGPA: 8.00/10*

SASTRA Deemed University **2021 Batch**
Bachelor of Technology in Electronics and Communication Engineering *CGPA: 8.08/10*

Related Research Papers

- K Sai Sri Teja, Hrishith Mitra, Girish Rongali, Kaushik Mitra, DIVA- Deep Indic Virtual Apparel Try-On. **ECCV Workshop 2024**.

- Yuekun Dai, ..., Kuppa Sai Sri Teja, Jayakar Reddy A, Girish Rongali, Kaushik Mitra: "MIPI 2024 Challenge on Nighttime Flare Removal: Methods and Results", 2024; arXiv:2404.19534, **CVPR Workshop 2024**.

- Elakkiya, R., K Sai Sri Teja, Jegatha Deborah, L., Bisogni, C. and Medaglia, C., 2022. Imaging based cervical cancer diagnostics using small object detection-generative adversarial networks. Multimedia Tools and Applications, pp.1-17.

- K Sai Sri Teja, Reddy, T.V., Sashank, M. and Revathi, A., 2022, April. 3D CNN Based Emotion Recognition Using Facial Gestures. In Evolution in Computational Intelligence: Proceedings of the 9th International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA 2021) (pp. 319-325). Singapore: Springer Nature Singapore.

Experience

Detect Technologies Pvt Ltd **July 2022 - Present**
Deep Learning Engineer - II *Chennai, TamilNadu*

- Developed and tested deep learning models for diverse applications in CCTV surveillance, specializing in Classification, Detection, and Segmentation tasks bringing the overall system accuracy to 90%.

- Hands-on experience with Nvidia DeepStream for real-time deployment. Established and managed a DLOps pipeline to enhance the scalability of both training and deployment processes. Implemented data quantization techniques to halve training time while maintaining accuracy. This helps us to train and test models 2x more models within the given time for internal experiments.

- Utilized diffusion and GANs (Generative Adversarial Networks) for synthetic data generation, significantly enhancing model performance. Developed an auto annotation tool that reduced the annotation team's labeling time for detection and classification tasks by 75%.

- Developed and optimized image restoration models (NAFNET, UFormer, and DiffIR) to enhance image quality for internal evaluations, providing superior ground truth data. Incorporated image restoration techniques and LLM to support neural networks, boosting system recall score to 95%.

- Developed a custom Fishbone Analysis system for Root Cause Analysis (RCA) and Correction and Protection Analysis (CPA) using multi-modal data (image and text) RAG System provided by clients, leveraging advanced Vision-Language Models (VLMs) such as LLama 3.2, LLama 3.1, Molmo, and LLava in combination with Large Language Models (LLMs).

Healthcare Technology Innovation Center - IIT Madras **Feb 2021 - June 2022**
Project Associate *Chennai, TamilNadu*

- Developed an entire package for robot-assisted needle-based Spine Surgery in Python. This in includes kinematics, path planning, singularity detection, and Collision avoidance. Experience of working with real-time robots, KUKA(Industrial Robot) and Han's Elfin Robot(Collaborative Robot).

- Experienced in working with robotics and ROS (Robot Operating System), a software platform for building and operating robotic systems. Proficient in programming robots to perform tasks, integrating camera sensors and developing algorithms in simulations and real-time for robotics applications. Gained experience working with the Intel RealSense camera for depth sensing and 3D scanning in various projects.

Projects

3D Reconstruction from SPAD Camera Data | *Prof Ashwin Sankaranarayanan (CMU)*   **06/2024 - Current**
- This ongoing collaboration with Prof. Ashwin, focuses on leveraging radiance fields to generate high-quality 3D reconstructions, using SPAD camera datasets as a prior input.

Night Time Video Flare Removal | *Prof Kaushik Mitra*   **05/2024 - 07/2024**
- Synthetic video data generation using traditional CV and DL-based methods.
- Experimention on various video-based architecture models to solve the existing flare removal problems.

Virtual Tryons for Indic Clothing | *Prof Kaushik Mitra*   **04/2024 - 07/2024**
- Implemented robotic process automation to scrape datasets from the internet and refine/annotate them using automated methods.
- Developed GAN and diffusion-based models for virtual try-ons, adapting these technologies specifically for Indian clothing.

Speech Disfluency Detection Using Deep Learning | *Prof A Revathi*   **09/2020 - 12/2020**
- Built a website for data collection of audio samples and deployed in Heroku(using flask) and the data is stored in an AWS S3 Container.
- Built a custom RESNET and trained it using spectrograms of audio for disfluency detection(filler words and repetitions) with an accuracy of 75%.

Sign Langauge Video Generator using GAN | *Prof R Elakkiya*   **05/2020 - 08/2020**
- Part of a 5-member team responsible for designing a complete sign language translation, which is sponsored by govt. with funding of 40 lakhs.
- Developed a deep learning GAN model for generating pose estimation sign language video of the user.

Technical Skills

Frameworks-Packages: Keras, PyTorch, Scikit-learn, Scipy, Numpy, WandB, Tensorflow, OpenCV, Pandas
Developer Tools: VSCode, Jupyter Notebook
Technologies: Linux, GitHub, Git, GitLab, Colab, AWS, ROS, Pybullet, Docker
Languages: Python

Achievements

- One among the world top 5 Teams in KUKA Robotics Challenge 2021(Team Aroki)
- Top 5 in the MIPI FLare removal challenge 2024(CVPR 2024).

Certifications and Workshops

- Participated 3D Vision Summer school(3DVSS) at IIIT Banglore(2024).

Other Research Papers

- Revathi, A., Vashista, D.V., K Sai Sri Teja and Nagakrishnan, R., 2020. A Robust Music Composer Identification System Based on Cepstral Feature and Models. In Advances in Communication Systems and Networks: Select Proceedings of ComNet 2019 (pp. 35-44). Springer Singapore.
- Revathi, A., Nagakrishnan, R., Vashista, D.V., K Sai Sri Teja and Sasikaladevi, N., 2020. Emotion Recognition from Speech Using Perceptual Features and Convolutional Neural Networks. Advances in Communication Systems and Networks: Select Proceedings of ComNet 2019, 656, p.355.

Relevant Coursework

- Deep Learning(Imaging)
- Linear Algebra
- Probability and Statistics
- Image Signal Processing
- Modern Computer Vision
- GANs Specialization

Research Areas

- Image Enhancement
- Dataset Pruning
- Image Generation

Extracurricular Activities

Spoken Languages: Telugu(Native), English(Proficient), Tamil(beginner)
Clubs: Member of Robotics Club SASTRA University.
Extra Skills: Handling Peer Pressure, Leadership, Team Work, Research Oriented Vision.