Sukruth Gowdru Lingaraju

Machine Learning Engineer

LinkedIn : glsukruth | Webpage : glsukki.github.io | : sg2257@cornell.edu | : glsukki@gmail.com
Address : New York City, NY | : +1 (608) 901-8040

Education

- **Cornell University** — Ithaca, NY
  Master of Engineering in Computer Science | GPA: 3.7/4.0 — *August 2022 - August 2023*
  Courses: Machine Learning, Computer Vision, Advanced Database Systems, Project Management, Social Entrepreneurship

- **M S Ramaiah Institute of Technology** — Bangalore, India
  Bachelor of Engineering in Information Science | GPA: 9.2/10.0 — *August 2018 - July 2022*
  Courses: Artificial Neural Networks, Data Structures, Object Oriented Programming, Design & Analysis of Algorithms

Skills Summary

- **Languages** : Python, C, C++, Java, SQL, Matlab, HTML, CSS, JavaScript
- **Libraries** : Numpy, Pandas, Scipy, scikit-learn, OpenCV, OpenFace, Selenium, BeautifulSoup, TensorFlow, PyTorch, Keras, HuggingFace, OpenAI, Transformers
- **Tools** : AWS S3, EC2, MTurk, GCP, Postman, Springboot, MySQL, MongoDB, Neo4j, Jenkins CI/CD, Git (VCS), Bitbucket, Atlas, Rally, VSCode, PyCharm, IntelliJ

Experience

- **Dicer.ai** — New York City, NY
  Machine Learning Engineer — *October 2023 - Current*
  - Developed an innovative image description optimization method using a Mixture of Experts (MoE) framework, integrating Carptriever and ChatGPT4 for topic modeling. Introduced a robust ranking algorithm to identify top-performing MoE pairs and incorporated Retrieval Augmented Generation (RAG) framework to consider pertinent information present in the image, resulting in enhanced image description quality.
  - Established and managed CI/CD pipelines for integrating top MoE pairs with RAG framework, base image descriptions, and CLIP image-to-image similarity score between base vs new AI generated image. Utilized advanced vision language models (ChatGPT4-V, LLaVA, CogVLM, Idefics) and leveraged DALLE3 to iteratively generate and improve thousands of advertisement images in-conjunction with refined descriptions.
  - Leveraged transformer models (VIT, OwlVIT) to discern and reconstruct essential image features through zero-shot bounding masks. Employed vision models (DALLE2, RunwayML) for in-painting in the feature regeneration process, highlighting expertise in leveraging advanced technologies for effective feature reconstruction.
  - Implemented Human Intelligence Tasks (HITs) projects on Amazon Mechanical Turk (MTurk) to curate a comprehensive image evaluation dataset comprising of thousands of images. The goal was to obtain human-generated responses pertaining to diverse image features, establishing ground truths to evaluate and improve the image description generation model. Developed various filters to reject human-generated submission by the MTurk workers that were fraudulent.

- **FARLab, Cornell Tech** — New York City, NY
  Research Intern | Advisor : **Dr. Wendy Ju** — *May 2023 - January 2024*
  - Engaging in research to unravel the correlation between human empathy and task failure performance in humans and robots.
  - Preprocessed and extracted human facial features using OpenFace and OpenCV libraries and implemented ML (RFs, DTs, GB, LogReg) and Deep Learning (LSTMs, BLSTMs, GRUs) models and performed hyper-parameter tuning to predict the type of failure occurrence given just the human facial data in a social setting, effectively discriminating between human and robot task failure.
  - Designed and conducted *In lab* vs *In the wild* studies to understand change in human behavior towards task failure performance and train a socially-aware robot to predict failure through domain adaptation by leveraging state-of-the-art visual ResNet architectures.
  - Created image dataset comprising of 200,000+ frames of human responses to task failure and fine-tuned ResNet50 model through transfer learning, which is based on the ImageNet classification model (trained on 14M+ images) for domain generalization and predict failure by extracting and evaluating the human facial features.

- **Sabre Corporation** — Bangalore, India
  Software Engineer Intern — *January 2022 - June 2022*
  - Engineered RESTAPIs utilizing SpringBoot to retrieve passenger & flight data from Sabre's Oracle database for the 'Departure Control System (DCS) - IQ: Recommendation Engine' to facilitate automated passenger upgradation in airlines.
  - Implemented a robust ranking algorithm to rank and recommend passengers for upgrade/downgrade/clear from the standby list, based on a set of criteria established by the airline on the basis of the passenger's travel history to discern manual errors (such as bias) and automate gate processing, thereby freeing up time.
  - Established and managed CI/CD pipeline for robust data delivery system using GCP and engineered scalable pipelines for data transfer and integration, ensuring efficiency and reliability in GCP services.

- **Bangalore Endoscopic Surgery Training Institute and Research Centre (BEST)** — Bangalore, India
  Data Analyst Intern — *March 2021 - August 2021*
  - Executed data acquisition and performed preprocessing tasks on data collected from onboard integrated sensors in the EndoTrainer used in performing laparoscopic cholecystectomy training.
  - Implemented machine learning models (SVMs and DNNs) for the classification and quantification of task performance.
  - Performed model visualisation, verification, validation, and hyper-parameter tuning with TensorBoard.
  - Performed synthetic data generation and data augmentation for regularisation of learning models.

Academic Projects

- **Humans, Robots, and Empathy: Investigating Bystander Reactions to Failure** — ***Funded by : Accenture Labs*** — Worked towards understanding the human empathy in relation to task failure performance, both in humans and robots to explore the intricacies of human emotions and utilize this comprehension as a learning parameter for robots. By recognizing their actions and leveraging this understanding, the aim is to empower robots to improve their performance in a variety of tasks.
- **Sign Language Translator for the Vocally Challenged (Deaf-mute) using Sensor - based Hand Gesture Recognition (HGR)** — ***Funded by : Artificial Intelligence and Robotics Technology Park (ARTPARK), Indian Institute of Science (IISc)*** — Designed and developed a Data Glove that utilized Inertial Measurement Unit (IMU) & Flex Sensors to capture precise finger movements and classify the signs gestured in real time through deep learning architectures. The classified gestures were then mapped to their corresponding associations based on the Indian Sign Language (ISL) and processed through NLP models such as DeepSegment - to segment sentences with no punctuation and libraries such as GingerIt, Gramformer, and GPT models for grammar correction to generate spoken language sentences/phrases and provided context-based corrections using full sentences as input.

Journal Publications

- **Sukruth G L**, Vijaya Kumar B P, Tejas M R, Rithvik K and Trisha Ann Tharakan, "Enhancing Collaborative Interaction with the Augmentation of Sign Language for the Vocally Challenged" International Journal of Advanced Computer Science and Applications (IJACSA), 14(1), 2023. DOI: http://dx.doi.org/10.14569/IJACSA.2023.0140199.

Teaching Experience

- **Cornell Bowers CIS** — Ithaca, NY
  Graduate Teaching / Research Specialist — *August 2022 - January 2023*
  - Graduate Head TA for the course CS 2024 [C++] during Fall '22 semester.
  - Drafted and tested programming assignments with other Teaching Assistants.
  - Instructed students individually during office hours and held discussion classes for a group of 75 students.
  - Responsible for assignments and homework grading.