







# Sukruth Gowdru Lingaraju

## Machine Learning Engineer

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### EDUCATION

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- 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

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- 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, Claude3, Gemini, Transformers
- Tools** : AWS S3, EC2, MTurk, GCP, Postman, Springboot, PostgreSQL, MySQL, MongoDB, Neo4j, Bazel, Jenkins CI/CD, Git (VCS), Bitbucket, Atlas, Rally, VSCode, PyCharm, IntelliJ

### RESEARCH PUBLICATIONS

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- [Accepted, and awaiting publication]* Maria Teresa Parreira, **Sukruth Gowdru Lingaraju**, Adolfo Ramirez-Aristizabal, Manaswi Saha, Michael Kuniavsky and Wendy Ju, “Bad Idea, Right?” Exploring Anticipatory Human Reactions for Outcome Prediction in HRI”, IEEE RO-MAN, 2024.
- Maria Teresa Parreira, **Sukruth Gowdru Lingaraju**, Adolfo Ramirez-Aristizabal, Manaswi Saha, Michael Kuniavsky and Wendy Ju, “A Study on Domain Generalization for Failure Detection through Human Reactions in HRI”, Social Signal Modeling in Human-Robot Interaction (SS4HRI) at HRI, 2024. DOI: doi.org/10.48550/arXiv.2403.06315.
- 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: dx.doi.org/10.14569/IJACSA.2023.0140199.

### EXPERIENCE

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- Dicer.ai** New York City, NY
  - Machine Learning Engineer *October 2023 - Current*
    - Led the development of an innovative **image description optimization method** as the lead engineer in a team of 4, leveraging the **Mixture of Experts** framework. Seamlessly integrated **SOTA LLMs** for sophisticated topic modeling. Introduced a **robust ranking algorithm** to dynamically identify top-performing MoE pairs, optimizing performance and incorporated **Retrieval Augmented Generation** framework, facilitating contextual consideration of pertinent visual information, significantly **enhancing the quality** of generated image descriptions by **30%** over the previous baseline.
    - 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 **VLMs** (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. These human-generated responses pertaining to diverse image features, were used to **establish ground truths** to evaluate and improve the image description generation model. Developed several **rules and filters to reject fraudulent** responses submitted by the MTurk workers.
    - Implemented the **DSPy** framework (by stanford) to optimize the LM prompts and weights in the generation of Ad Insights, Recommendations, and Executive Summaries through RAG. Set up the **ChainOfThought** processing module with **Multi-Hop Q&A** search system that is capable of considering queries and contextual information related to the ad such as descriptions and performance metrics towards generating summaries. Set up an evaluation system for validating the generated summaries through AI feedback for few-shot learning.

- FARLabs, Cornell Tech**

New York City, NY

Research Intern | Advisor : **Dr. Wendy Ju** | *Funded by Accenture Labs*

May 2023 - January 2024

  - Researched in unravelling the **correlation** between human empathy and task failure performance in humans and robots. Extracted and curated human **facial features** using OpenFace and an image dataset comprising of **250,000+ frames** of human responses to task failure.
  - Performed **Domain Generalization** by training and testing deep learning models with **hyper-parameter tuning** (LSTMs, BLSTMs, GRUs) in different settings (**In-Lab** vs **In-the-wild**) to obtain generalized models capable of predicting **control** vs **failure** through human reactions towards task performance.
  - Fine-tuned and tested the **ResNet50** model through **transfer learning** on 250,000+ frames of human responses to task performance. Developed **custom DataLoaders** to handle large datasets that is capable of training DL models on k-fold splits to decrease the use of compute resources by over **70%**.
- Sabre Corporation**

Bangalore, India

Software Engineer Intern
 

January 2022 - June 2022

  - Designed and developed **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 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

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- 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.

## AWARDS

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- Artificial Intelligence & Robotics Technology Park (ARTPARK)** — Received the 'Student Innovation Grant' Award from ARTPARK, IISc. Obtained funding of INR 660,000 from the Artificial Intelligence and Robotics Technology Park (ARTPARK), Indian Institute of Science (IISc) (a joint-initiative of IISc, Alfoundry, Department of Science and Technology (DST) and Government of Karnataka) during the 2021 call for 'Student Innovation Grant Program in Artificial Intelligence, Robotics and Autonomous Systems'

## TEACHING EXPERIENCE

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- 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.