Rukmangadh Sai Myana

(+1) 305-427-8776
Miami, Florida
rukman.sai@gmail.com

PhD Candidate

Google Scholar ⤤
GitHub: braceletboy ⤤
LinkedIn: rukman-sai ⤤

EDUCATION

Ph.D in Computer Science, *Florida International University*   **2022 — Present**
COURSES: *Intro to Algorithms, Operating Systems, Advanced Topics in Machine Learning, Advanced Computer Graphics*
     GPA: *4.0/4.0*

B.Tech in Electrical Engineering, *I.I.T Bombay*   **2016 — 2020**
COURSES: *Deep Learning - Theory and Practice, Fundamentals of Digital Image Processing, Probability and Random Processes, Data Analysis and Interpretation, Advanced Concentration Inequalities, Introduction to ML*

PUBLICATIONS

- *Explaining Protein Folding Networks Using Integrated Gradients and Attention Mechanisms* ⤤
  Rukmangadh Sai Myana, Sumit Kumar Jha.
  13th International Conference on Computational Advances in Bio and Medical Sciences 2025 *[being published]*
- *Explainable Parallel RCNN with Novel Feature Representation for Time Series Forecasting* ⤤
  Jimeng Shi, **Rukmangadh Sai Myana**, Vitalii Stebliankin, Azam Shirali, Giri Narashimhan.
  European Conference on Machine Learning (ECML-PKKD) AALTD Workshop 2023
- *Deep Learning Models for Water Stage Predictions in South Florida* ⤤
  Jimeng Shi, Zeda Yin, **Rukmangadh Sai Myana**, Khandker Ishtiaq, Anupama John, Jayantha Obeysekera, Arturo S. Leon, Giri Narashimhan. Journal of Water Resources Planning and Management 2025

SKILLS

Tools and Languages	*[Proficient]*	Python, C++, Git, LaTeX, MarkDown, Pytorch, RayTune
	[Competent]	SQL, Java, Tensorflow, Keras, bash, RabbitMQ, MATLAB
Quantitative Skills	*[Proficient]*	Pandas, Matplotlib, NoSQL, PostgreSQL, Grafana, Metabase, SQL, PySpark

WORK EXPERIENCE

Associate Data Scientist [PYTORCH, ML, DL, CV, NLP, ASR, SQL]   **Aug 2020 — Jul 2022**
Nobroker.com   *Bengaluru, Karnataka*

- Re-purposed the **UNet** model to remove watermarks from images using **VGG Perceptual Loss** and achieved a **PSNR of 73.94dB**
- Supervised a data curation team and designed a generalized curation process using **labelstudio** for curating robust datasets.
- Built **SSD MobileNetV2** and **SSD ResNet150 FPN** models to detect watermarks on images with an **0.93 mAP score.**
- Built **SVC + RoBERTa classifier** for detecting the positive/negative sentiment in call transcripts with **82.5% accuracy**.
- Built a **Bi-directional RNN** model for **Automatic Speech Recognition** and achieved a **0.32 Word Error Rate** using **KenLM**.
- Built a **Transformer Encoder** model for **Automatic Speech Recognition** development using the **FAIRSeq** library as reference.
- Parallelized the audio preprocessing pipelines using **multiprocessing package** and achieved **16 times faster** processing speed.
- Supervised a data curation team and designed a generalized curation process using **labelstudio** for curating robust datasets.
- Created dashboards in **metabase** using **PostgreSQL** to help the product team analyze various business and market trends.
- Queried data from **NoSQL** databases like **MongoDB, ElasticSearch** to analyse data using **Pandas, Matplotlib, Seaborn**.
- Generated **Analytical Reports** based on the conducted analysis and **documented** their utility on Atlassian's **Confluence** platform.
- Spearheaded the **software design** and execution of a **microservice** for stitching images into a video using **FFMPEG**   *[Article* ⤤*]*
- Revamped designed five out of the **seven microservices** in the Image Intelligence System **within a period 2 months**.   *[Article* ⤤*]*
- Parallelized the microservices using **Celery** asynchronous workers on **Google Kubernetes** with automatic resource scaling.
- Facilitated microservice communication via **REST APIs** by using **Redis** cache and **RabbitMQ** request queues.

Machine Learning Intern [PYTORCH, PYSPARK, DATABRICKS, SCIKIT-LEARN, XGBOOST, SQL]   **May 2024 — Aug 2024**
                                          & May 2025 — Aug 2025
Advanced Semiconductor Materials Lithography (ASML)   *San Diego, California*

- Developed **ML techniques** for modelling Tin Droplet Generation process in state of the art lithography machines.
- Developed prototypes using **XGBoost**, Kernel Ridge Regression, AdaBoost, **Extremely Randomized Tree Regression** to predict **time to failure** of droplet generation using feedback metrics and achieved an **MAE** of **0.92 seconds** with the best model.
- Achieved **100x speed up** in processing, cleaning and standardizing of 650GB of raw signal data using **Multiprocessing Pool API**.
- Parallelized transfer of raw data from machines to **Databricks** Volumes and achieved **10x speed up** using **ThreadPoolExecutor**.
- Built **Databricks Dashboards** using **SQL** for preliminary analysis and visualization of **2.5 TB** of machine feedback metrics.
- Developed Neural Nets using **multi-task learning** for **multi-scale** time to failure prediction of the droplet generation process.
- Leveraged **PySpark SQL API** and **Databricks Notebooks** to parallelize the cleaning and standardization of the training data.

Graduate Data Engineer [Python, SQL, ETL]   **May 2023 — May 2024**
Florida International University   *Miami, Florida*

- Designed and administered an **ETL pipeline** to automate the processing of public datasets sourced from various city websites.
- Built scripts to condense about **150 data columns** from 22 cities into **65 standardized columns** and input the data into **MariaDB**.
- Created a user interface for data visualization using **Grafana** and implemented a documentation site utilizing **MediaWiki**.
- Created **dashboards** using **SQL** to visualize and address public policy questions for city officials and academic researchers.

Graduate Tutor [C++, Algorithms]   **Aug 2022 — Dec 2024**
Florida International University   *Miami, Florida*

- Tutored a student with **severe vision impairment** for the *Operating Systems course* at Florida International University.
- Took weekly **C++** sessions to familiarize the student with various components of the Nachos Instructional Operating System.
- Provided tutoring to students taking the challenging **Algorithms course**, known for its high failure rate among students.
- Was the **only student** in my class of **forty** to receive **4.0/4.0 Grade Points** in this challenging algorithms course.

Graduate Research Assistant [PyTorch, Research]   **Aug 2022 — Present**
Florida International University   *Miami, Florida*

- Contributed to development of a novel forecasting model that achieved an **8% lower** MAE than it's competitors on average.
- Implemented forecasting models DeepAR and MQRNN in **Pytorch** and finetuned them using **HyperBand** algorithm in **Ray-Tune**.
- Analyzed the effectiveness of **Integrated Gradients** and its variants in explaining protein folding networks like **AlphaFold2**.

Projects

Memory Augmented Neural Networks for Lifelong Learning [PyTorch, Meta ML]   **Mar 2023 — Mar 2023**
Skylark Labs, Interview Project 🔗   *Miami, Florida*

- Adapted the paper One-shot Learning with Memory-Augmented Neural Networks for **Lifelong Learning**
- Implemented the paper in **PyTorch** and vectorized the memory attention mechanism using the **Einsum Operation**.

Surveying Knowledge Transfer Techniques [PyTorch, Research]   **Aug 2019 — Nov 2019**
Prof. Amit Sethi, B.Tech Project 🔗   *Mumbai, Maharastra*

- Reviewed the literature on **Knowledge Distillation**, Attention Transfer, **Multi-task learning** and Continual Learning.
- Adapted a **Knowledge Transfer paper** for CNNs, demonstrating that its approach effectively mitigates catastrophic forgetting.
- Observed a significant accuracy boost of **23 percentage** points in continually learned CNN models compared to the original models prone to catastrophic forgetting, across datasets including MNIST, Fashion MNIST, KMNIST, and SVHN.

Digital Image Processing [MATLAB, Computer Vision]   **Aug 2019 — Nov 2019**
Prof. Suyash Awate, Course Project 🔗   *Mumbai, Maharastra*

- Implemented basic image transformation and filtering algorithms from scratch using the matrix operations in **MATLAB**.
- Implemented a simple **Face Recognition** algorithm from scratch using **Singular Value Decomposition (SVD)**.
- Implemented the paper **Image Quilting for Texture Synthesis and Transfer** to stitch smaller images into larger images.

NachOS - Operating System [C++, Unix]   **Aug 2022 — Dec 2022**
Prof. Raju Rangaswami, Course Project 🔗   *Miami, Florida*

- Implemented universally vital synchronization primitives like **Locks** and **Condition Variables** in the **C++** programming language.
- Built a synchronized simulation of an elevator system by modeling it as a **multi-threaded** program of elevator & person threads.
- Implemented process-control Unix system calls like **Fork**, **Join**, **Exec**, **Yield**, **Kill**, and **Exit** in C++ to support multi-programming.
- Implemented file-management Unix system calls like **Create**, **Open**, **Write**, **Read**, and **Close** in C++ to support persistent storage.

ALRFU - Adaptive Caching Algorithm [Python, Research]   **Dec 2018 — Sep 2019**
Prof. Giri Narasimhan, Research Project   *Mumbai, Maharastra*

- Designed an adaptive caching algorithm called **Adaptive LRFU (ALRFU)** by modelling the problem as a **multi-armed bandit**.
- Designed novel cache data structures like **Heap Cache** and **Fibonacci Heap Cache** for efficient storage of cached pages.
- Achieved **hitrate of 73%** on memory traces, almost as good as the *state-of-the-art* **ARC algorithm**, which is an industry standard.

Other Work

- Designed Turing complete 6-stage **Pipelined and Multicycle RISC processors** on **FPGA** using **VHDL**.   *[Course-Project* 🔗*]*
- Implemented the CycleGAN paper in Pytorch during my attempts to better understand generative models.   *[Self-Project* 🔗*]*
- Research Internship at the **National University of Singapore**   *[Research-Internship]*
  - Implemented a novel **edge detection algorithm** as part of the SINAPSE Institute for **Bio-Robotics** and Neuroengineering
  - Exploited the correlation between spatial and temporal statistics of images captured from a **neuromorphic camera**.
  - Developed a **Fully Connected Network** using **Keras** for object classification using SpikeGroups as input features.
- Worked on developing a **rolling shutter correction** algorithm for images captured from a fast-moving camera. *[Winter Internship]*