

# Rahul Mohan Kumar

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## EDUCATION

### University of Colorado Boulder

*Master of Science in Computer Science — GPA: 3.941/4*

Aug 2021 – May 2023

*Boulder, CO*

### PSG College of Technology

*Bachelor of Engineering in Computer Science and Engineering*

July 2016 – Sep 2020

*Coimbatore, India*

## SKILLS

**Languages:** Python, C/C++, Java, R, MatLab, SQL (MySQL), JavaScript, HTML/CSS

**Frameworks:** Django, PyTorch, React, Spark, Hadoop, HDFS, WordPress

**Developer Tools:** Git, Docker, Google Cloud Platform, BigQuery, Kubernetes, Redis, VS Code, Visual Studio

**Libraries:** Tensorflow, Keras, Theano, NLTK, Scikit-Learn, pandas, NumPy, Boost, OpenCV Matplotlib, Seaborn

## EXPERIENCE

### Graduate Research Assistant

*SNaG Lab - University of Colorado Boulder*

Aug 2021 – Present

*Boulder, CO*

- Researching on interpreting deep learning architectures using representation learning and transfer learning. Improved training time by 80% without compromising accuracy in deep neural network architectures (AlexNet, VGG16, MobileNetV2, and ResNet101) by implementing lambda masking layers to selectively ablate functionally specific neurons after each hidden layer.
- Authored the paper “Much Easier Said Than Done: Falsifying the Causal Relevance of Decoding Methods” that was accepted at *ICBINB@NeurIPS 2022*

### Data Science Intern

*LiveRamp*

May 2022 – Aug 2022

*San Francisco, CA*

- Experimented on XGBoost to replace existing binary ridge regression model, improving training time by 93% without affecting accuracy
- Analyzed experiments in BigQuery for sample size and feature selection, reducing number of features required to train on by 97.5%
- Encapsulated the training code and dependencies within GPU-enabled containerized environments which were deployed and scheduled by Kubernetes to run on multiple GPU nodes.

### Software Development Engineer Intern

*Nuclear Power Corporation of India Limited*

Apr 2019 – June 2019

*Kalpakkam, India*

- Developed a Surface Anomaly Detection and Profiling tool using Computer Vision, surface phase detection and 3D imaging/processing for Nuclear Power Plants to detect defects with 95% accuracy
- Incorporated robotic manipulators and sensors to facilitate autonomous surface inspection and defect localization. Utilized simulated nuclear plant environments to validate the accuracy and reliability of defect detection, profiling, and robotic manipulation.

## PROJECTS

### Real-time ASL Recognition System for a Robotic Arm

- Developed custom machine learning and computer vision techniques to enable accurate and real-time recognition of ASL gestures. Implemented ROS nodes for sensor data acquisition, gesture recognition, and robot control, enabling efficient communication and coordination between different system components.
- Integration of Boost libraries and efficient algorithms, enabling real-time gesture interpretation with minimal latency. Reduced processing time by 30%, resulting in smoother and more natural interactions.

### Music Separation as a Service

- Developed a RESTful music separation service utilizing Facebook’s demucs tool to automatically separate drums, bass, and vocals from accompanying music, enhancing the user experience.
- Implemented Redis queues for efficient task management and leveraged Min.io object storage system to handle MP3 files and store waveform separation output effectively.
- Orchestrated the deployment of the music separation service on Google Cloud Platform (GCP) using Google Kubernetes Engine (GKE), ensuring scalability and reliability.