

# Sathyanarayanan Ramamoorthy

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## EDUCATION

<b>Carnegie Mellon University - School of Computer Science (MS)</b> <i>Master of Computational Data Science at Language Technologies Institute (LTI) - (GPA: 3.95)</i>	Pittsburgh, USA 08/22 – 05/24
<b>Indian Institute of Information Technology (BS)</b> <i>Bachelor of Technology in Computer Science and Engineering (CGPA: 9.13/10)</i>	Sricity, India 07/18 – 06/22

## ACADEMIC/RESEARCH EXPERIENCE ([SCHOLAR PROFILE](#))

<b>Research Associate - Full Time</b> <i>Carnegie Mellon University at LTI, Advisor: <b>Prof. Graham Neubig</b></i>	01/24 – Present Pittsburgh, PA, USA
<ul style="list-style-type: none"><li>Working on Multimodal Multilingual language-agnostic <b>entity linking problems</b> using LLMs</li><li>Developed a system, with dataset, baseline methods and work under review at <b>TACL 2024</b>.</li><li>Researched <b>Vision-Language diffusion models</b> through image transcreation with Google Research, co-authored work accepted at <b>EMNLP Main 2024</b> (<a href="#">Link</a>) and got best paper award (<a href="#">Link</a>)</li><li>Contributed to the open-source multilingual multicultural multimodal LLM project called <b>Pangea</b> (<a href="#">Link</a>)</li></ul>	
<b>Research Intern - Internship</b> <i>Artificial Intelligence Institute at University of South Carolina</i>	01/22 – 06/22 Columbia, USA
<ul style="list-style-type: none"><li>Developed a <b>BERT</b> based deep learning approach, for multimodal joint embeddings.</li><li>Worked on a <b>GPT-based medical chatbot</b> and enhanced its capability through context-driven learning.</li><li>Achieved this through context-driven learning using Knowledge Graphs, Coreference Resolution, NER.</li></ul>	
<b>Research Intern - Internship</b> <i>Wipro Artificial Intelligence Labs</i>	06/21 – 12/21 Bangalore, India
<ul style="list-style-type: none"><li>Proposed an approach to generate multimodal vision-text joint embeddings using transformer models.</li><li>Achieved <b>SOTA</b> on meme emotion analysis task and presented the work at <b>AAAI 2022</b> (<a href="#">Link</a>).</li><li>Was an Organizing Committee Coordinator for the workshop, <a href="#">DE-FACTIFY</a>, co-located at AAAI 2022.</li></ul>	

## INDUSTRY EXPERIENCE

<b>Applied Scientist Intern - Internship</b> <i>Amazon Alexa, Invocation Science</i>	05/23 – 08/23 Cambridge, MA, USA
<ul style="list-style-type: none"><li>Part of the wakeword invocation team under the <b>Amazon Alexa Perceptual Technologies Organization</b>.</li><li>Performed data augmentation with synthetic data using <b>generative methods</b> to support speech technology development, particularly with the help of Large Language Models (LLMs), ASR and TTS Models.</li><li>Implemented a pipeline for synthesis and trained, researched, evaluated and analyzed wakeword models.</li><li>Improved the existing wakeword baseline model performance by <b>28%</b>.</li></ul>	

## SELECT PUBLICATIONS

- Nethra Gunti, Sathyanarayanan Ramamoorthy, Parth Patwa and Amitava Das, [“Memotion Analysis through the Lens of Joint Embedding \( Student Abstract\) ”](#), In Proceedings of the **AAAI** Conference on Artificial Intelligence, 2022.
- Simran Khanuja, Sathyanarayanan Ramamoorthy, Yueqi Song, Graham Neubig, [“An image speaks a thousand words, but can everyone listen? On image transcreation for cultural relevance”](#), In Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (**Best Paper Award at the conference**)

## PROJECTS

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**High Performance Web Service using Cloud** | *Python, Java, MySQL* 02/23 – 04/23

- Designed and implemented a complete web-service solution with three microservices for querying big data.
- Optimized algorithms and deployed on AWS, **achieving 75000 RPS** with minimum cost through Kubernetes.
- Developed auto-scalable, load-balanced and fault-tolerant applications with MySQL optimization and ETL using tools like Spark, Scala, Hadoop, Amazon RDS, EKS, and Docker.

**Image Domain Translation** | *PyTorch, Django* 01/21 – 12/21

- Achieved image to image translation from Night-time Infrared (IR) domain to Day-time RGB domain.
- Used **Generative Adversarial Networks (GANs)** like Pix2Pix, CycleGAN, Self-attention-GAN models.
- Incorporated Knowledge Distillation to compress the model by 95% and deployed using Django and ReactJS

**Drug-Drug Interaction Prediction** | *PyTorch Geometric, PyTorch* 02/21 – 05/21

- Detected Drug-Drug side effect interactions using Graph Neural Networks with a best AUROC score of 90.4%
- Extracted network features using a Relational Graph Convolution Network Encoder
- Node features were initialized by Node2Vec and MLP decoder predicted the presence of interactions between nodes

## TECHNICAL SKILLS

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**Languages:** Python, C/C++, SQL, Java

**Tools & Technologies:** Pytorch, Tensorflow, Transformers, Pandas, NumPy, AWS, GCP, Scipy