

Sriram Balasubramanian

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WORK EXPERIENCE

AI Developer – RelAI, College Park, Maryland

JUNE 2023 - AUGUST 2023, JUNE 2024 - AUGUST 2024

- Developed and designed multiple applications to enhance vision model reliability for RelAI
- Involved in the development of RelAI, contributing from the inception stage through planning, execution, and deployment phases.

Research Intern – Comcast, Washington D. C.

JUNE 2022 - AUGUST 2022

- Investigated the effectiveness of transfer learning in deep neural networks in the low resource regime (when the target domain has very limited data). Devised non-neural methods which could outperform both traditional collaborative filtering methods and neural networks in this regime.

Research Fellow – Microsoft Research, India

AUGUST 2020 – AUGUST 2021

- **Predicting e-mail arrivals and reads:** Built machine learning models to predict e-mail arrivals and reads from user type and history of arrivals/reads to improve cache hit rates.
- **Simulating network paths using ML:** Built machine learning models to simulate internet paths using static network traces

PUBLICATIONS AND PREPRINTS

Decomposing and Interpreting Image Representations via Text in ViTs Beyond CLIP

– *NeurIPS 2024 (Spotlight at Mechanistic Interpretability Workshop, ICML 2024)* [Link]

- Devised algorithms to decompose image representation into contributions from different parts of the model and interpret them by projecting to CLIP space
- Applied this algorithm to different models to perform image based image retrieval, spurious correlation mitigation, token contribution visualization, and more.

Exploring Geometry of Blind Spots in Vision Models

– *NeurIPS 2023 (Spotlight)* [Link]

- Studied the (under) sensitivity of deep neural networks to perturbations in the input
- Introduced a Level Set Traversal algorithm that explores regions of high confidence in these networks and identifies inputs that share the same confidence level.

Towards Better Input Masking for Convolutional Neural Networks

– *ICCV 2023* [Link]

- Devised an input masking technique for CNNs called layer masking, which simulates running the CNN on only the unmasked input, minimally changing the intermediate activations
- Significantly improved perturbation-based interpretability techniques like LIME which rely on masking out parts of the image to produce importance scores

What's in a Name? Are BERT Named Entity Representations just as Good for any other Name?

BERT can be surprisingly brittle with respect to named entities – *RepL4NLP, ACL 2020* [Link]

Simulating Network Paths with Recurrent Buffering Units

Encode network semantics into LSTMs to simulate network traffic better – *AAAI 2023* [Link]

Can AI Generated Text be Reliably Detected?

No. Media coverage at Washington Post, Wired, TechSpot, New Scientist – *Arxiv* [Link]

Rethinking Artistic Copyright Infringements in the Era of Text-to-Image Generative Models

How to define artistic style in the era of GenAI and can it be copyrighted? – *Arxiv* [Link]

EDUCATION

MS/PhD in Computer Science

– UMD, College Park

AUG 2021 – PRESENT

- **GPA: 4.0/4.0**

Bachelor's in Computer Science with Honors – IIT Bombay, India

AUG 2016 – MAY 2020

- **GPA: 9.56/10.0**

COURSEWORK

Machine Learning, Deep Learning, Linear Algebra, Statistics, Artificial Intelligence, Optimization, NLP, Computer vision, RecSys

TECHNICAL SKILLS

Languages: Python • Matlab • \LaTeX • C/C++ • SQL • Java

ML Frameworks: PyTorch • Lightning • Tensorflow • Keras • MXNet

AWARDS AND ACHIEVEMENTS

- Awarded Institute Academic Prize for exceptional academic performance in IIT Bombay [2017]
- Ranked **2nd** in the institute out of about 900 students in the first year at IIT Bombay [2017]
- Ranked **4th** in JEE Mains out of 1.2 million candidates all over India [2017]
- Awarded KVPY Fellowship by the Government of India [2015]
- Awarded NTSE scholarship by N.C.E.R.T [2014]

TEACHING ROLES

Teaching Assistant: Programming Handheld systems •2022
•UMD College Park

Teaching Assistant: Probability and Statistics •2021 •UMD College Park

Teaching Assistant: Data Interpretation and Analysis •2019 •IIT Bombay

Teaching Assistant: Electricity and Magnetism •2018 •IIT Bombay