

Sriram Balasubramanian

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WORK EXPERIENCE

Research Intern – Comcast, Washington D. C.

JUNE 2022 - AUGUST 2022

- Investigated the effectiveness of transfer learning of deep neural nets in the context of recommender systems and compared it with state-of-the-art traditional collaborative filtering methods

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

Intern – Tower Research Capital, India

MAY 2019 – JULY 2019

- Developed tools to analyse trading and market logs and compute fill ratios (number of order fulfilled / number of orders sent) for various securities

Research Intern – IST, Austria

MAY 2018 – JULY 2018

- Implemented fast algorithms for finding algebraic path properties (like distance queries) in graphs with small treewidth, and used it for dataflow analysis on control flow graphs with distributive dataflow functions.

RESEARCH AND PUBLICATIONS

Increasing robustness in Natural Language Processing

2020 – IIT Bombay [\[Link to paper\]](#)

- Explored training algorithms robust to synonym and named entity replacement attacks on tasks including text classification, grammar correction, co-reference resolution and question answering
- Demonstrated the presence of non-robustness in state-of-the-art BERT based models on the above tasks

Simulating Network Paths with Recurrent Buffering Units

2021 – MSR India [\[Link to paper\]](#)

- Introduced a novel grey-box approach to network simulation that embeds the semantics of physical network path in a new RNN-style architecture called Recurrent Buffering Unit (RBU)
- RBUs combine the interpretability of standard network simulator tools with the power of neural models, the efficiency of SGD-based techniques for learning, and yield promising results on synthetic and real-world network traces.

PROJECTS

- Deep image priors for vision transformers** Investigated inductive biases in modern vision architectures like Swin transformers by using methods introduced by Ulyanov et al in "Deep Image Priors".
- Excessive invariance in neural networks** Discovered that many state-of-the-art neural networks can be highly insensitive to significant changes in input; used confidence calibrated models to solve this problem
- A blockchain currency simulation in Racket:** Built a simulation of cryptocurrency transactions including digital signatures, maintaining and cutting blockchain forks, etc.

EDUCATION

Master's in Computer Science –

University of Maryland, 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 and Deep Learning

Artificial Intelligence

Optimization

Information Retrieval & Web Mining

Linear Algebra and Multivariable Calculus

TECHNICAL SKILLS

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

ML Frameworks: PyTorch • 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]

RESPONSIBILITIES

Teaching Assistant: Programming Hand-held 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