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 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

Advanced Machine Learning
Foundations of Deep Learning
Artificial Intelligence
Optimization
Information Retrieval & Web Mining
Linear Algebra

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 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*