

VIJAY S KALMATH

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EDUCATION

Columbia University

New York, NY

Master of Science in Data Science, 3.8/4.0

Expected Dec 2022

Coursework: Deep Learning, Advanced Deep Learning, Machine Learning, Statistical Inference, Cloud Computing, Algorithms.

B.M.S College of Engineering

Bangalore, India

Bachelor of Engineering in Electronics and Communications, 9.37/10.0

May 2018

Coursework: Data Structures and Algorithms, C, Discrete Mathematics and Probability, Python, Java, Operation Systems.

WORK EXPERIENCE

Columbia University, WiMNet Lab

New York, USA

Graduate Deep Learning Research Assistant

May 2022 - Jul 2022

- Formulated and Implemented Data Extraction pipelines for 25+ Radar Measurements to develop range-velocity data.
- Analyzed dataset to determine spatial properties and tested dimensionality reduction techniques for better detection.
- Achieved a 30% increase in accuracy with **Convolutional Neural Networks** designed to use the complex-valued dataset.
- Developed Time Distributed CNN with **LSTMs for Image sequence classification** to capture temporal relationship within data.

Cisco Systems

Bangalore, India

Technical Consulting Engineer-II-Escalation Engineer

Jan 2020 - Jul 2021

- Devised Team Performance analysis system and built **Regression Models** to generate and analyze periodic managerial reports.
- Designed Data Pipeline for stateful tracking of Cisco Lab's ACI systems using Python, MongoDB, and JavaScript.
- Authored 5 technical briefs with a focus on ACI and its integration with **Docker Swarm, Kubernetes-Flannel**, and OpenStack.
- Supervised hiring and mentoring of 28 engineers in Networking and DevOps technologies, Python, JavaScript, and MongoDB.

Technical Consulting Engineer-II

Jul 2019 - Dec 2019

- Troubleshoot Cisco ACI (Application Centric Infrastructure) with a focus on **RAFT** and **Linux based distributed computing systems**.
- Spearheaded over 32 automation projects to enhance ACI product usability and ease engineers' work with Python and JavaScript.

Technical Consulting Engineer-I

Jul 2018 - Jul 2019

- Inspected, Identified, and troubleshoot Cisco Routing and Switching Issues in ACI and VMware Integration with ACI.
- Integrated Docker and Kubernetes services with ACI along with cloud services like AWS and Azure.

DEEP LEARNING-DATA SCIENCE PROJECTS

Columbia University, Adversarial Training in Distillation of BERT

Jan 2022 - May 2022

- Investigated the impact of **teacher-student model-compression** on the robustness of **BERT-like Language Models** with PyTorch.
- Designed and Implemented test space of Visual and Context-based adversarial attacks using the TextAttack Library.
- Trained **semi-supervised GANBERT** and performed **distillation of GANBERT** to test robustness under adversarial attacks.
- Investigated performance of **4+ Gradient based Adversarial Data Augmentations** techniques on GANBERT and DISTILBERT.
- Proved that adversarial data augmentation post-model-compression performs better than adversarial training of parent model.

Columbia University, Spectral Representations for Convolutional Neural Networks

Sep 2021 - Dec 2021

- Built Custom spectral pooling, frequency dropout, and spectral convolution **TensorFlow** layers with Fourier transform.
- Designed low pass filters for dimension reduction and custom imaginary weights initializer for spectral convolution layer.
- Attained **80% test accuracy** with a 40% decrease in training time with spectral CNN using **spectral pooling** and **Bayesian hyperparameter** tuning for CIFAR-100.
- Achieved **2.2 - 5.1 times** computation speed up with **Spectral parameterized CNN** architectures for ImageNet and CIFAR-100.

Cisco Systems, SSD Degradation Analysis

Jun 2020 - Aug 2020

- Identified and examined SSD Degradation on ACI switches and formulated insights using Python, SQL, and MongoDB.
- Built Models to analyze SSD degradation to identify software defects and anomalies for over **500+ Customers**.
- Computed and created a **visual dashboard** of the SSD analysis of over 9000+ switches with Pandas and Tableau.
- Accelerated SSD degradation analysis for engineers and customers, allowing for more proactive efforts and reducing time spent by almost **20 minutes per analysis**.

LANGUAGES AND SKILLS

- Programming Languages – Python, R, JavaScript, C++.
- Databases – SQL, Postgres, MongoDB, Elastic-Search.
- Python Packages – TensorFlow, HuggingFace, WandB, PyTorch, Scikit-Learn, Pandas, NLTK, OpenCV, Matplotlib, Seaborn.
- Cloud Services – AWS Sagemaker, AWS Lex, AWS Lambda, AWS EKS, Azure Cloud, Google BigQuery.
- Infrastructure Technologies – Linux, ELK Stack, Docker, Kubernetes, Kafka, CI/CD Pipelines with Jenkins, Kubeflow.