# 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 CNNs designed to use phase and amplitude of 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, Kubernetes, 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
- Troubleshot 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 troubleshot 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.

## DATA SCIENCE PROJECTS

**Columbia University, Adversarial Training in Distillation of BERT**          Jan 2022 - Dec 2021
- Investigated the impact of the student-teacher model-compression technique on the robustness of BERT-like Models on 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, CI/CD Pipelines with Jenkins, Kubeflow.