VIGNESH KOTHAPALLI

+1-212-961-7356 | k.vignesh1420@gmail.com | github.com/kvignesh1420 | in/kvignesh1420

EDUCATION

- **New York University, Courant Institute of Mathematical Sciences**   Sep 2021 - May 2023 (Expected)
  Master of Science in Computer Science, Advisor: Joan Bruna   *GPA: 3.95/4*
  Research Interest: Graph Neural Networks, Randomized Linear Algebra, Monte Carlo Techniques
- **Indian Institute of Technology Guwahati**   Jul 2014 – May 2018
  B.Tech in Electronics and Communication Engineering   *GPA: 8.2/10*

TECHNICAL SKILLS

- **Languages:** C, C++, Python, Scala
- **Machine Learning Technologies:** Horovod, Tensorflow, Keras, PyTorch, PyTorch geometric, DGL, Scikit-learn
- **Tools/Frameworks:** Docker, Flask, MySQL, MongoDB, Git, Kafka, Spark, Impala, Airflow, Streamsets, MLFlow, Travis

WORK EXPERIENCE

- **Math and Data Group, NYU Center for Data Science**   Sept 2022 – Present
  Graduate Researcher
  – Extending the unconstrained features model to non-euclidean domains for analysing "neural collapse".
  – Developing randomized graph augmentations and negative sampling techniques for graph contrastive learning.
- **LinkedIn**   May 2022 – Aug 2022
  Summer Intern
  – Developed gradient compression techniques for reducing the pre-training duration of BERT models by 20%.
  – Customized the LAMB optimizer to reduce the compute and memory overheads during compression by 3x.
  – Contributed to Horovod by implementing the batched memory copy operations for tensor fusion in allgather ops.
- **IBM CIO Labs**   Jul 2018 – Aug 2021
  Software Developer
  – Developed a dependency graph framework to facilitate root-cause analysis of events in distributed data platforms.
  – Employed MLOps techniques to train and serve auto-encoder models in production for detecting anomalies in Kafka,
    Solr and HDFS telemetry data. The framework aided in reducing the MTTR by 80%.
  – Built and deployed time-series models using variational inference techniques for predicting the resource consumption
    and throughput of data pipelines with an accuracy of 90%.
- **Indian Institute of Science**   May 2017 – Jul 2017
  Research Intern
  – Created a dataset of low-resolution and high-resolution binary image pairs of Tamil documents and proposed baseline
    super-resolution techniques for document image quality enhancement.
  – Our best performing model improved the OCR accuracy of low-resolution test images by 140%.

PUBLICATIONS

- Neural Collapse: A Review on Modelling Principles and Generalization   *Arxiv 2022*
- Edge detection using fractional derivatives and information sets   *JEI 2018*
- Binary Document Image Super Resolution for Improved Readability and OCR Performance   *Arxiv 2018*
- Robust Recognition of Mizo Digits Using CNN-LSTM and Nonlinear Spectral Resolution   *INDICON 2018*
- Abnormal Event Detection on BMTT-PETS 2017 Surveillance Challenge   *CVPR (W) 2017*

SELECTED PROJECTS

- **Tensorflow** (Open-source)
  – Contributor of *tensorflow* and maintainer of *tensorflow-io*. Developed APIs to train keras models from data sources such
    as kafka, elasticsearch and mongoDB. Additionally, made various contributions to tf.data.
- **Facial expression recognition in videos using curriculum learning techniques**
  – Designed and trained ResNet & VGG based neural networks using curriculum learning techniques to recognize facial
    expressions from videos of the EmotiW-2017 dataset.

HONORS AND AWARDS

- Google Open Source Peer Bonus Award (TensorFlow) - 2021
- IBM Managers Choice Award - 2018, 2019
- Merit based scholarship from Govt of Telangana, India from 2015-2017