VIGNESH KOTHAPALLI

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EDUCATION

- **New York University, Courant Institute of Mathematical Sciences** Sep 2021 - May 2023
  Master of Science in Computer Science, Advisor: Joan Bruna *GPA: 3.97/4*
  Research Interest: Deep Learning Theory, Graph Neural Networks, Randomized Linear Algebra
- **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
- **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

- **LinkedIn** July 2023 – Present
  Systems and Infrastructure Engineer
  - Developing tools for benchmarking, profiling, and observability of large language model (LLM) training workflows.
  - Reduced the training latencies of Feed AI models by 20% using mixed precision training and data IO optimizations.
- **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.
  - Implemented batched memory copy for tensor fusion in allgather and added support for int8 allreduce in Horovod.
- **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%.

PUBLICATIONS

- **A Neural Collapse Perspective on Feature Evolution in Graph Neural Networks**
  Vignesh Kothapalli, Tom Tirer, Joan Bruna
  Advances in Neural Information Processing Systems (NeurIPS) Dec 2023
- **Randomized Schur Complement Views for Graph Contrastive Learning**
  Vignesh Kothapalli
  International Conference on Machine Learning (ICML) Jul 2023
- **Neural Collapse: A Review on Modelling Principles and Generalization**
  Vignesh Kothapalli
  Transactions on Machine Learning Research (TMLR) Apr 2023
- **Edge detection using fractional derivatives and information sets**
  Vignesh Kothapalli, Shaveta Arora, Madasu Hanmandlu
  Journal of Electronic Imaging Jun 2018
- **Binary Document Image Super Resolution for Improved Readability and OCR Performance**
  Ram Krishna Pandey, *Vignesh Kothapalli*, AG Ramakrishnan, B Chandrahasa
  https://arxiv.org/abs/1812.02475 Dec 2018
- **Robust Recognition of Tone Specified Mizo Digits Using CNN-LSTM and Nonlinear Spectral Resolution**
  Vignesh Kothapalli, Biswajit Dev Sarma, Abhishek Dey, Parismita Gogoi, Wendy Lalhminghlui, Priyankoo Sarmah, SR Mahadeva Prasanna, SR Nirmala, Rohit Sinha
  IEEE INDICON Dec 2018
- **Abnormal Event Detection on BMTT-PETS 2017 Surveillance Challenge**
  Vignesh Kothapalli, Gaurav Yadav, Amit Sethi
  IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops Jul 2017

PROFESSIONAL SERVICE

- **Open Source Contributions**: Tensorflow, Tensorflow-IO, Horovod.
- **Reviewer:** IEEE Transactions on Cybernetics, IEEE Access, IEEE Transactions on Industrial Informatics.