

ADHITHYAN KALAIVANAN

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EDUCATION

KTH Royal Institute of Technology

Stockholm, Sweden

Master of Science in Machine Learning

2021 - 2023*

- Relevant Coursework: Machine Learning, Advanced Course; Machine Learning Theory; Time Series Analysis; Deep Learning, Advanced Course; Computational Methods for SDE and Machine Learning;

Notable projects

Thesis: On Linear Mode Connectivity up to Permutation of Hidden Neurons in Neural Networks

- Empirically showed that weight averaging lowers loss in wide networks due to feature redundancies
- Averaging is shown to work best when networks are reparameterized to be permutation aligned, but only under the choice of some optimizers, highlighting the impact of training dynamics on mode connectivity

Git Bi-sect: Dissecting Git Re-basin

- Reproduced Git Re-basin (ICLR 2023) from Ainsworth et. al. that investigates linear mode connectivity and low loss basins in deep neural networks when accounting for permutation invariance of hidden units
- Highlighted under-explored role of training hyperparameters on the trajectory of weight updates in SGD

Network Representation Learning

- Implemented and trained unsupervised representation learning models – DeepWalk, LINE, GraphSage etc.
- Evaluated the embeddings on public datasets for node classification and link prediction tasks

Model Extraction Attacks on CNNs

- Investigated a class of privacy attacks where the aim is to “steal” a black box model with only query access
- Evaluated the effect of model architecture, levels of output access and querying strategy on the attack

Programming languages and Frameworks: Python, PyTorch, JAX, Tensorflow

Indian Institute of Technology Madras (IITM)

Chennai, India

Bachelor of Technology in Mechanical Engineering, Minor in Biomedical Engineering

2011 - 2015

- CGPA: 8.41/10. Ranked 883rd in the Joint Entrance Exam (IIT-JEE 2011) out of 460,000 appeared candidates
- Relevant Coursework: Linear Algebra and Numerical Analysis; Differential Equations; Dynamical Systems

WORK EXPERIENCE

KTH Royal Institute of Technology

Stockholm, Sweden

Teaching Assistant

2021 - Present

- Teaching Assistant for Artificial Intelligence course, Machine Learning, Advanced and Deep Learning in Data Science courses, responsible for conducting tutorials and grading student submissions

Robert Bosch Engineering & Business Solutions

India & Germany

Software Specialist

2015 – 2020

Advanced Driver Assistance Systems and Automatic Parking Brake

- Designed the control and communication strategy between the braking unit and perception units
- Developed the state estimation, actuation intention detection and diagnostics of Automatic Park Brake