

MOHAMMED HAROON DUPTY

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RESEARCH INTERESTS

Machine Learning: Graph Representation Learning, Probabilistic Graphical Models, Approximate Inference, Generative Modeling, Deep Learning.

RESEARCH EXPERIENCE

Research Fellow

School of Computing & Institute for Functional Intelligent Materials
National University of Singapore
Projects: AI Guided Design and Molecular Generation
Advisor : Prof. Wee Sun Lee

Singapore
March 2022 - Present

EDUCATION

PhD, National University of Singapore

Computer Science
Thesis: Algorithmic Inductive Biases for Graph Representation Learning
Advisor : Prof. Wee Sun Lee
CGPA: 4.13/5
Research Achievement Award 2020

Singapore
August 2017 - Jan 2022

M.Tech, International Institute of Information Technology Bangalore

Computer Science
Thesis: Active Learning for Automatic Image Annotation with Bayesian CNNs
Advisor : Prof. G Srinivasaraghavan
CGPA: 3.82/4

Bangalore
July 2015 - June 2017

PUBLICATIONS

- **Constrained Layout Design with Factor Graphs**
Mohammed Haroon Dupty, Yanfei Dong, Sicong Leng, Guoji Fu, Yong Liang Goh, Lu Wei and Wee Sun Lee
In submission
- **Differentiable Cluster Graph Neural Network.**
Yanfei Dong, Mohammed Haroon Dupty, Lambert Deng, Yong Liang Goh and Wee Sun Lee
In submission
- **Implicit Graph Neural Diffusion Based on Constrained Dirichlet Energy Minimization.**
Guoji Fu, Mohammed Haroon Dupty, Yanfei Dong and Wee Sun Lee
*NeurIPS Workshop: New Frontiers in Graph Learning, 2023, **Oral***
- **Tell2Design: A Dataset for Language-Guided Floor Plan Generation.**
Sicong Leng, Zhou Yang, Mohammed Haroon Dupty, Lu Wei and Wee Sun Lee
*Association for Computational Linguistics (ACL), 2023, **Area Chair Award***
- **Factor Graph Neural Networks.**
Zhen Zhang*, Mohammed Haroon Dupty*, Fan Wu, Javen Shi and Wee Sun Lee
Journal of Machine Learning Research (JMLR), vol-24(181), 2023
* Equal contribution
- **ProtoGNN: Prototype-Assisted Message Passing Framework for Non-Homophilous Graphs.**
Yanfei Dong, Mohammed Haroon Dupty, Lambert Deng, Yong Liang Goh, Wee Sun Lee
Preprint, 2023

- **PF-GNN: Differentiable Particle Filtering Based Approximation of Universal Graph Representations.**

Mohammed Haroon Dupty, Yanfei Dong and Wee Sun Lee

International Conference on Learning Representations (ICLR), 2022

- **Visual Relationship Detection with Low Rank Non-Negative Tensor Decomposition.**

Mohammed Haroon Dupty, Zhen Zhang and Wee Sun Lee

*AAAI Conference on Artificial Intelligence (AAAI), 2020, **Spotlight***

- **Graph Representation Learning with Individualization and Refinement.**

Mohammed Haroon Dupty and Wee Sun Lee

Arxiv preprint, arxiv:2203.09141

- **Neuralizing Efficient Higher-order Belief Propagation.**

Mohammed Haroon Dupty and Wee Sun Lee

Arxiv preprint, arxiv:2010.09283

- **Scheduling Under Power and Energy Constraints**

Mohammed Haroon Dupty, Pragati Agrawal, and Shrisha Rao

Arxiv preprint, arXiv:1609.07354 (2016)

- **Schmitt Trigger Based SRAM Using Finfet Technology-Shorted Gate Mode**

Vasundara P., Bhushan, H., Gadag K., Nischal P, & Haroon, M.

International Journal of Electrical and Computer Engineering, 2014, vol-8(2).

SERVICE

- **Invited Reviewer:** NeurIPS 2022/2023, ICML 2023/2024, ICLR 2022/2023, CVPR 2024, KDD 2023, ACML 2021/2022
- **Publication Chair:** ACML 2021

MENTORSHIP

- **Masters Dissertation:** Arkaprabha Bhandari, School of Computing, NUS 2022 - 2023

INDUSTRY EXPERIENCE

Firetide Networks Pvt Ltd.

Software Developer

June 2013 - March 2014

Bangalore, India

- Involved in the development of embedded software (proprietary Firetide Mesh Routing Protocol(FMRP)) for Wireless Mesh Network Nodes and Access Points.
- Developed SNMP (Simple Network Management Protocol) Agent for Wireless Mesh Nodes and Access Points.
- Developed Automation scripts in Perl for testing of network software.

TEACHING EXPERIENCE

National University of Singapore

Assistant Lecturer

November 2020 - Present

Singapore

- **AI Literacy Programme**

National University of Singapore

Teaching Assistant

January 2018 - December 2018

Singapore

- **Programming Methodology (CS1010S):** AY 2017/18 Sem 2
- **Introduction to Algorithms (CS3230):** AY 2018/19 Sem 1, AY 2018/19 Sem 2
- **AI Planning and Decision Making(CS4246/CS5446):** AY 2019/20 Sem 1, AY 2019/20 Sem 2, AY 2020/21 Sem 1

International Institute of Information Technology, Bangalore*Teaching Assistant - C programming*July 2016
Bangalore, India

- Taught advanced concepts of C language
- Helped students build a Virtual File System and Personal Data Store

Govt. Tool Room and Training Centre*Lecturer*

August 2014 - December 2014

Bangalore, India

- Taught courses on Advanced Programming and Communication Systems at diploma level
- Taught algorithmic implementations in the lab and Oversaw students on mini projects

TECHNICAL SKILLS

- **Deep learning libraries:** Pytorch, Tensorflow, Pytorch-geometric, Keras
- **Programming Languages:** Python, C, C++, Java, Perl
- **Software Tools:** Matlab, L^AT_EX, Vim, Eclipse
- **Other libraries/Frameworks:** OpenCV, Scikit-learn, Caffe, Apache Spark

ACHIEVEMENTS

- NUS Research Achievement Award 2019-2020
- NUS PhD Research Scholarship, 2017-2021
- Dean's Merit List : January 2016, August 2016 in IIIT Bangalore
- Qualified GATE-2015 with 98.93 percentile among 115425 candidates.