Jeehyun Hwang

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INTERESTS Neural Differential Equations, Spatiotemporal Models, Graph-based Neural Networks, Physics-informed Machine Learning

EDUCATION

Yonsei University Mar. 2016 - Present
Undergraduate Student Seoul, Korea
Bachelor of Engineering in Computer Science (Expected graduation: Feb. 2022)

PUBLICATIONS &PREPRINTS

Jeehyun Hwang, Jeongwhan Choi, Hwangyong Choi, Kookjin Lee, Dongeun Lee, and Noseong Park. Climate Modeling with Neural Diffusion Equations. In *IEEE International Conference on Data Mining (ICDM)*, 2021 [pdf][code]

Seulki Yeom, Kyunghwan Shim, and Jeehyun Hwang, Toward Compact Neural Networks via Energy-Aware Pruning. preprint arXiv: 2103.10858 [pdf]

RESEARCH EXPERIENCE

Big Data Analytics Lab, Yonsei University Jul. 2020 – Oct. 2021
Research Intern (Advisor: Prof.Noseong Park) Seoul, Korea

Application Platform Lab, Hongik University Dec. 2019 – Jun. 2020
Research Intern (Advisor: Prof.Yoon Young) Seoul, Korea

WORK EXPERIENCE

Nota.Inc Jan. 2021 – Feb. 2021
Research Scientist Intern (Advisor: Dr.Seulki Yeom) Seoul, Korea

PROJECTS

Graph Neural Controlled Differential Equations Jul. 2021 - Oct. 2021
Big Data Analytics Lab at Yonsei University, Research Intern
- Built spatiotemporal graph neural controlled differential equation (STG-NCDE).
- Proposed STG-NCDE showed highest performance in benchmark datasets of traffic forecasting and irregularly sampled traffic dataset.

Climate Modeling with Neural Diffusion Equations Mar. 2021 - Oct. 2021
Big Data Analytics Lab at Yonsei University, Research Intern
- Designed novel climate model based on neural ordinary differential equations (neural ODEs) and diffusion equation.
- NDE can be viewed as either one of neural partial differential equation or continuous version of diffusion-based graph neural network.

Energy-Aware Pruning Jan. 2021 - Feb. 2021
Nota.Inc, Research Scientist Intern
- Proposed a new filter pruning criteria based on nuclear-norm (NN) of each filter.
- Proposed NN-pruning showed top accuracy with lowest FLOPs and parameters. It also shows robustness among data quality and quantity.

Neural Partial Differential Equations Jul. 2020 - Dec. 2020
Big Data Analytics Lab at Yonsei University, Research Intern
- Introduced novel partial differential equation (PDE) based approach for image classification, learning both governing equation and its solution for image classification.
- Our PDE-regularized neural network (PR-Net) showed better performance in terms of accuracy, robustness compared to neural ODEs and Isometric MobileNet V3.

Network Traffic Anomaly Detection Nov. 2019 - Jul. 2020
Application Platform Lab, Research Intern
- Built a framework that performs anomaly detection (DDoS, Brute Force, PortScan, etc.) of network packet datasets.
- The given data set was processed through feature engineering, and then density-based clustering was performed in latent vector space.

AI Programming with Python Nanodegree Jan. 2019 - Mar. 2020
Udacity, Nanodegree [Certificate]
- Learned essentials of calculus, linear algebra, neural network, and designed image classifiers.

COMPUTER SKILLS

Languages: Python, R, Java, C, C++
Web Development: NodeJS, MySql, JavaScript, PHP, HTML, CSS
Deep Learning Framework: (Proficient) Pytorch, (Familiar) Keras

LANGUAGE PROFICIENCY

Fluent in **English** and Native in **Korean**
- IBT TOEFL: 109
- GRE: 152 (Verbal), 169 (Quantative), 4.0 (Writing)

OTHER ACTIVITIES

Military Service Feb.2018 - Nov. 2019
Served as Korea National Police Agency Auxiliary Police