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seohyeoncha

Seohyeon Cha Ph.D.

Education

University of Texas at Austin — Austin, TX
Ph.D. in Electrical and Computer Engineering — 2024 - Present
- Advisor: Prof. Haris Vikalo
- Research area: Federated learning, Trustworthy AI, Generative models

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Korea
M.S. in Electrical Engineering — 2022 - 2024
- Advisor: Prof.Joonhyuk Kang
- GPA: 4.17/4.3

B.S. in Electrical Engineering — 2017 - 2022
- Summa Cum Laude
- GPA: 4.03/4.3 (Major GPA: 4.1/4.3)

Publications

1. Honggu Kang, **Seohyeon Cha**, Jinwoo Shin, Jongmyeong Lee, and Joonhyuk Kang, "NeFL: Nested Federated Learning for Heterogeneous Clients," *arXiv preprint arXiv:2308.07761*, 2023. (submitted)
2. **Seohyeon Cha**, Honggu Kang, and Joonhyuk Kang, "On the Temperature of Bayesian Graph Neural Networks for Conformal Prediction," In *NeurIPS 2023 Workshop: New Frontiers in Graph Learning*, 2023.
3. **Seohyeon Cha**, Sanghyuk Kim, Jiwan Seo, and Joonhyuk Kang, "Intelligent Surface-aided Transmit-array Antenna in mmWave Communication System with Historical Channel Observation," In *IEEE International Conference on Consumer Electronics-Asia (ICCE-Asia)*, 2022.

Research Experiences

Generative Model-aided FL for Heterogeneous Clients — Sep 2023 - Present
- FL framework in which heterogeneous models utilize feature-generative models
- Demonstrate compatibility of generative models in FL in terms of accuracy, model heterogeneity, and privacy

Model Scaling in FL for Heterogeneous Clients — Jan 2023 – Sep 2023
- Adaptive model scaling method in both width/depth dimensions for FL
- Provide impact of pre-trained models and statistical heterogeneity within the proposed framework

Trustworthy Graph Learning via Conformal Prediction (CP) — Jan 2023 – Sep 2023
- Bayesian GNNs with temperature that enhances set predictor informativeness
- Analyze the relationship between informativeness and model calibration

Projects

Surface Defect Detection of Airplane Using Object Detection — Jul 2023 - Jan 2024
- Implement object detection algorithm for surface defect detection using PyTorch

Spectrum Sensing and Signal Type Classification in 6GHz Band — Sep 2021 - Jan 2024
- Implement shared spectrum model in 6 GHz band using MATLAB
- Devise signal classification and detection algorithm using PyTorch

Awards and Honors

- **National Science and Engineering Scholarship**, Academic Excellence — 2019 - 2021
- **Korean Governmental Scholarship**, KAIST Graduate — 2022 - 2024
- **Korean Governmental Scholarship**, KAIST Undergraduate — 2017 - 2018

Teaching Experiences

Undergraduate Individual Study Assistant | KAIST
- Help undergraduates understand ML theory and code implementation, Spring 2023
- Cover concepts of federated learning and its implementation, Fall 2023

Teaching Assistant | KAIST
- EE205 Data Structures and Algorithms for Electrical Engineering, Fall 2022
- EE966 M.S. Seminar <Colloquium>, Spring/Fall 2023

Counseling Assistant | KAIST Sep 2022 - Feb 2023
- Counseled 32 undergraduate/graduate students
- Helped them with coursework, career decisions, and relationships

Tutor for freshman | KAIST 2018 - 2019
- MAS101 Calculus 1, MAS102 Calculus 2
- Taught calculus and problem-solving, met once a week during semester

Skills

Languages: English (Fluent), Korean (Native)

Programming: `Python`, `C`, `C++`, `LaTex`.

Softwares: `PyTorch`, `MATLAB`, `Linux`, `Git`.