Seohyeon Cha

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EDUCATION

Korea Advanced Institute of Science and Technology (KAIST),

M.S. in School of Electrical Engineering — Mar 2022 – Present
- Advisor: Prof. Joonhyuk Kang
- Focus: Conformal prediction, Bayesian learning, graph learning
- Cumulative GPA: 4.17 / 4.3

B.S. in School of Electrical Engineering — Mar 2017 – Feb 2022
- Cumulative GPA: 4.03 / 4.3 *(Summa Cum Laude)*
- Major GPA: 4.10 / 4.3

INTEREST

Uncertainty Estimation for Machine Learning, Model Calibration, Robust Learning

PUBLICATIONS

PREPRINT

[P1] Honggu Kang, **Seohyeon Cha**[2], Jinwoo Shin, Jongmyeong Lee, and Joonhyuk Kang, "NeFL: Nested Federated Learning for Heterogeneous Clients," under-review. [pdf][code]

CONFERENCES

[C1] **Seohyeon Cha**[1], 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. [pdf][code]

RESEARCH EXPERIENCE

Advanced Radio Technology Lab (ARTLab), KAIST

- **Revisiting Conformal Prediction in Graph Neural Networks** — Aug 2023 – Present
  - Detail: Conformal prediction beyond and with exchangeability in graph neural networks
  - Focus: Conformal prediction, graph inductive learning
- **Efficient Calibration of Bayesian Models with Conformal Prediction** — Jan 2023 – Aug 2023
  - Detail: Control credible region via Bayesian temperature for calibration purpose
  - Experimentally proved Bayesian temperature scaling reduces prediction interval size
  - Focus: Conformal prediction, variational inference
- **Generalized Federated Learning** — Jan 2023 – Aug 2023
  - Detail: Adaptive model scaling framework in FL to address system heterogeneity
  - Participated in set up of theoretical background, result interpretation, and writing
  - Focus: Federated learning, Neural ordinary differential equations (ODEs)
- **Intelligent Transmitting Surface Research** — Jul 2022 – Sep 2022
  - Detail: SGD-based algorithm with historical channel observations in intelligent surface
  - Sponsor: Agency for Defense Development / Specialized Research Center
  - Focus: Intelligent surface, Millimeter-wave system
  - Published paper based on work, gave oral presentation at ICCE-ASIA 2022

Undergraduate Research Program (URP), KAIST

- **Study on data valuation and learning algorithm using data value** — Dec 2020 – Jun 2021
  - Detail: Analysis on memorization and forgetting events of data
  - Supervisor: Prof. Hyewon Chung
  - Focus: Data valuation, Outlier detection

HONORS AND AWARDS

National Sciences and Engineering Scholarship, Korea Student Aid Foundation — 2018 – 2020
Korean Governmental Scholarship — 2017 – 2018
Korean Governmental Scholarship (Graduate) — 2022 – Present

TEACHING EXPERIENCE

Research Assistant, KAIST — Mar 2023 – Present
- Covered machine learning theory and implementation through pytorch

Teaching Assistant, KAIST — Sep 2022 – Dec 2022
- EE205 Data Structures and Algorithms for Electrical Engineering

OTHER ACTIVITIES

Counseling Assistant for undergraduate/graduate students, KAIST — Sep 2022 – Feb 2023
- Counseled 32 students with topics on grades, career, and relationships

Tutoring for freshman students, KAIST — 2018 – 2019
- Courses: MAS101 Calculus 1, MAS102 Calculus 2
- Taught calculus and problem solving to freshmen for semester

Internship, DRAM design department, SK hynix — Jun 2019 – Aug 2019

Voice of KAIST (V.O.K), Producer — 2017 – 2019
- Made videos and wrote scripts for events and festivals in KAIST
- Played role of broadcasting a radio and writing scripts during semester

LANGUAGE & SKILLS

Fluent in **English** and Native in **Korean**
TOEFL 105 (R30/L29/S23/W23)
Advanced in Python, Pytorch, MATLAB, Novice in C, C++, Julia

REFERENCES

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[*CV compiled on 2023-08-19*]