

Changho Shin

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RESEARCH INTERESTS

My research is focused on **foundation models**, including **large language models** and **multimodal foundation models**. Much of my work aims to efficiently help these models adopt new skills. This involves two prongs: **(1) approaches for obtaining and selecting fine-tuning data**, often by using a strategy called **weak supervision** and **(2) efficient adaptation**, including training-free approaches like **model editing**.

EDUCATION

University of Wisconsin-Madison Sep. 2020 –
• Ph.D. Computer Science, M.S. Mathematics
• Advisor: Professor Frederic Sala

Seoul National University Mar. 2015 – Feb. 2017
• M.S. Machine Learning
• Advisor: Professor Wonjong Rhee

Seoul National University Mar. 2011 – Feb. 2015
• B.A. in Psychology, B.S. in Computer Science and Engineering
• Graduated with honors (Cum Laude)

HONORS & AWARDS

Qualcomm Innovation Fellowship Finalist 2024
Best Paper Award Honorable Mention (NeurIPS R0-FoMo Workshop) 2023
NeurIPS 2023 Scholar Award 2023
Winner in DataComp competition (Filtering Track, Small) 2023

CONFERENCE PUBLICATIONS

- [C1] Dyah Adila*, **Changho Shin***, Linrong Cai, Frederic Sala, “Zero-Shot Robustification of Zero-Shot Models With Auxiliary Foundation Models”, *International Conference on Learning Representations (ICLR)*, 2024.
Workshop version [W1]: **Best Paper Award Honorable Mention, Oral Presentation** at *NeurIPS 2023 R0-FoMo Workshop*.
- [C2] **Changho Shin**, Sonia Crompt, Dyah Adila, Frederic Sala, “Mitigating Source Bias for Fairer Weak Supervision”, *Neural Information Processing Systems (NeurIPS)*, 2023.
- [C3] **Changho Shin**, Winfred Li, Harit Vishwakarma, Nicholas Roberts, Frederic Sala, “Universalizing Weak Supervision”, *International Conference on Learning Representations (ICLR)*, 2022.
- [C4] **Changho Shin**, Sunghwan Joo, Jaeryun Yim, Hyoseop Lee, Taesup Moon, Wonjong Rhee, “Subtask Gated Networks for Non-Intrusive Load Monitoring”, *AAAI Conference on Artificial Intelligence*, 2019.

JOURNAL PUBLICATIONS

- [J1] **Changho Shin**, Eunjung Lee, Jeongyun Han, Jaeryun Yim, Hyoseop Lee, Wonjong Rhee, “The ENERTALK Dataset, 15 Hz Electricity Consumption Data from 22 Houses in Korea”, *Nature Scientific Data*, 2019 (Impact Factor = 5.929).
- [J2] **Changho Shin**, Seungeun Rho, Hyoseop Lee, Wonjong Rhee, “Data Requirements for Applying Machine Learning to Energy Disaggregation”, *Energies*, May 2019 (Impact Factor = 2.707).

WORKSHOP PUBLICATIONS

- [W1] Dyah Adila*, **Changho Shin***, Linrong Cai, Frederic Sala, “Foundation Models Can Robustify Themselves, For Free”, *NeurIPS 2023 R0-FoMo Workshop*. **Best Paper Award Honorable Mention, Oral Presentation**.
- [W2] **Changho Shin***, Joon Suk Huh*, Elina Choi, “Pool-Search-Demonstrate: Improving Data-wrangling LLMs via better in-context examples”, *NeurIPS 2023 Table Representation Learning (TRL) Workshop*. **Oral Presentation**.

- [W3] **Changho Shin***, Tzu-heng Huang*, Sui Jiet Tay, Dyah Adila, Frederic Sala, “Multimodal Data Curation via Object Detection and Filter Ensembles”, *ICCV 2023 Datacomp Workshop* (Rank #1 in DataComp competition filtering track (small)).
- [W4] **Changho Shin**, Alice Schoenauer-Sebag, “Can we get smarter than majority vote? Efficient use of individual rater’s labels for content moderation”, *NeurIPS 2022 Workshop: Efficient Natural Language and Speech Processing (ENLSP)*, 2022.

PREPRENTS

- [P1] **Changho Shin**, Jitian Zhao, Sonia Crompt, Harit Vishwakarma, Frederic Sala, “OTTER: Improving Zero-Shot Classification via Optimal Transport”, *Under Review*, 2024.

JOB EXPERIENCE

Twitter, San Francisco, USA Jun. 2022 – Aug. 2022
ML Engineer Intern
 • Mentor: Alice Schoenauer Sebag • Manager: Milind Ganjoo
 • Improving toxicity classification via weak supervision [W4]

Encored Technologies, Seoul, Korea Jan. 2018 – Jul. 2020
Data Scientist
 • Advisor: Dr. Hyoseop Lee
 • Non-intrusive load monitoring [C4, J1, J2], Energy forecasting

Korea Institute for Defense Analyses, Seoul, Korea Jan. 2017 – Dec. 2017
Researcher

TEACHING EXPERIENCE

University of Wisconsin-Madison
 • Teaching assistant for CS 839 (Foundation Models) Fall 2023
 • Teaching assistant for CS 300 (Programming II) Fall 2022, Spring 2023
 • Teaching assistant for CS 760 (Machine Learning) Fall 2021, Spring 2022
 • Teaching assistant for CS 320 (Data Programming II) Spring 2021
 • Teaching assistant for CS 220 (Data Programming I) Fall 2020

TECHNICAL SKILLS

Machine Learning / Deep Learning / Data Science
 PyTorch, TensorFlow, Keras, scikit-learn, NumPy, Pandas, SciPy

DBMS
 MySQL, MongoDB, PySpark

Research & Development Tools
 Jupyter, PyCharm, Docker, GitHub, CircleCI, Shell, Amazon Web Services

Programming Languages
 Python, R, MATLAB, Java, Go, C, L^AT_EX