Saebyeol Shin

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EDUCATION

Cornell University   **Ithaca, NY, USA**
Ph.D. in Computer Science *(Advisor: Prof. Kilian Q. Weinberger)*   *08/2024 – Present*

Sungkyunkwan University (SKKU)   **Seoul, Korea**
B.S. in Computer Science & Engineering (Double Major: Data Science)   *03/2019 – 08/2023*
Honors: ***Summa Cum Laude***

PUBLICATIONS *(* denotes equal contribution)*

➢ Q. Wang, JP. Zhou, Z. Zhou, <u>S. Shin</u>, B. Han, KQ. Weinberger. **"Rethinking LLM Unlearning Objectives: A Gradient Perspective and Go Beyond."** International Conference on Learning Representations (ICLR), 2025.

➢ <u>S. Shin</u>, A. Jaiswal, S. Liu, and Z. Wang. **"Unveiling the Intertwined Relationship Between Essential Sparsity and Robustness in Large Pre-trained Models."** Data-centric Machine Learning Research (DMLR) Workshop at ICLR, 2024.

➢ G. Lee*, <u>S. Shin*</u>, T. Na, and SS. Woo. **"Real-Time User-guided Adaptive Colorization with Vision Transformer."** IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2024.

➢ G. Lee*, <u>S. Shin*</u>, D. Ko, J. Jung, and SS. Woo. **"A-ColViT: Real-time Interactive Colorization by Adaptive Vision Transformer."** International Workshop on Practical Deep Learning in the Wild at AAAI, 2023.

➢ <u>S. Shin,</u> SS. Woo. **"Deepfake Detection using Effective Mask Attention."** Korean Artificial Intelligence Association (KAIA), 2023.

➢ G. Lee, <u>S. Shin,</u> and SS. Woo. **"Accelerating CNN via Dynamic Pattern-based Pruning Network."** ACM International Conference on Information & Knowledge Management (CIKM), 2022.

➢ G. Lee, <u>S. Shin,</u> and SS. Woo. **"Efficient Multi-Scale Feature Generation Network."** Korea Computer Congress (KCC), 2022.

➢ S. Lee*, D. Ko*, J. Park, <u>S. Shin</u>, D. Hong, and SS. Woo. **"Deepfake Detection for Fake Images with Facemasks."** ACM Workshop on the Security Implications of Deepfakes and Cheapfakes (WDC), 2022.

➢ J. An*, J. Kim*, H. Lee, J. Kim, J. Kang, M. Kim, <u>S. Shin</u>, M. Kim, D. Hong, and SS. Woo. **"VFP290K: A Large-Scale Benchmark Dataset for Vision-based Fallen Person Detection."** Neural Information Processing Systems (NeurIPS), 2021.

RESEARCH EXPERIENCE

ML Core Lab @ Cornell University   **Ithaca, NY, USA**
Graduate Research Assistant (Advisor: Prof. Kilian Q. Weinberger)   *08/2024 – Present*
• Developing token-level backtracking mechanism for Large Language Models (LLMs) to reduce hallucination.

Visual Informatics Group (VITA) @ University of Texas at Austin   **Austin, TX, USA**
Research Intern (Advisor: Prof. Zhangyang "Atlas" Wang)   *07/2023 – 03/2024*
• Investigated the impact of "essential sparsity" on the robustness of LLMs, revealing how adversarial robustness is affected by network compression in pre-trained transformers.

Data-driven AI & Security HCI Lab (DASH) @ SKKU   **Suwon, Korea**
Undergraduate Research Assistant (Advisor: Prof. Simon S. Woo)   *06/2021 – 01/2023*
• Developed a pruning network to preserve the advantages of both static and dynamic networks, enhancing the kernel's representational power and achieving acceleration; US Patent No. 18/613,332, Korea Patent No. 10-2023-0038133
• Excellence Undergraduate Research Project (A+ for whole participation – 2021 fall & 2021 winter & 2022 spring): Examined deepfake detection methods with manipulated images to prevent privacy invasion/security threats.

WORK EXPERIENCE

SK Telecom AI Fellowship   **Pangyo, Korea**
Research Intern   *06/2022 – 11/2022*
- Developed user-interactive, context/instance adaptive colorization model to colorize and restore old monochrome images of historically significant events in Korea such as Gwangju Uprising (May 18 Gwangju Democratization Movement).
- Won an order for the 3 year project to restore the old image from the Jeollanam-do Provincial Office supervised by the Ministry of Culture, Sports and Tourism; Korea Patent No. 10-2023-0000445

PROJECT EXPERIENCE

Restoring grayscale images of Korean War Veterans using AI Technology.   **Ministry of Patriots and**
Research on Image Colorization & Super Resolution (MOU project)   **Veterans Affairs (MPVA)**
- Developed AI technology for restoring historical images of Korean War Veterans.   *02/2023 – 06/2023*

Object Detection in Satellite Images   **Hanwha System/ICT**
Industry-Academic Cooperation Researcher   *05/2022 – 09/2022*
- Developed a rotated object detection network on Military Synthetic Aperture Radar (SAR) datasets.; "Real-time rotated object detection model for SAR image", SW copyright No. C-2022-049663

Solving Mathematical Problems using NLP Technology   **Institute for ICT Promotion (IITP)**
Researcher, 5th AI Grand Challenge   *07/2021 – 05/2022*
- Developed efficient deep learning models for solving mathematical problems that understands natural language context, improving inference speed, and distributed open-source software (web application)

Abnormal Behavior Detection in CCTV using Object Detection Algorithm   **IITP**
Researcher, 4th AI Grand Challenge   *06/2021 – 12/2021*
- Developed a novel, large-scale dataset for robust fallen person detection in real-world scenarios and published a research paper highlighting its applicability to related fields such as intelligent CCTV and monitoring systems.

AWARDS AND HONORS

[Awards]
- 2nd Place, (Grand Prize), Co-Data Station Datathon, President Award of AI Convergence and Open Sharing System   *07/2023*
- 2nd Place, WRTN Prompthon ("Prompt"+"Hackathon"), WRTN Technologies Inc.   *06/2023*
- 3rd Place (Bronze Award), Dean Award in AI Project [SWE3032], Department of Software   *12/2022*
- 3rd Place, 2022 Capstone Design Project Competition [SWE3028], Department of Software   *12/2022*
- 2nd Place (Grand Prize), SKT AI Fellowship   *11/2022*
- 4th Place (top 1.5%), Natural Language-based Climate Technology Classification AI Competition, DACON   *08/2021*
- Research Grant Winner, 5th AI Grand Challenge, IITP   *07/2021*
- 1st Place (Grand Prize), Sungkyunkwan University Convergence Project   *08/2020*

[Scholarships]
- AAAI 2023 Student Scholarship   *02/2023*
- CIKM 2022 SIGIR Student Travel Grants   *10/2022*
- SKKU Student Success Changeui Scholarship (100% tuition support)   *06/2022*
- SKKU Student Success Didimdol Scholarship   *10/2020*
- SKKU Academic Excellence Scholarship (70% tuition support)   *02/2020*
- Mega Study Scholarship (external)   *05/2019*

TEACHING EXPERIENCE

K-Software Empowerment BootCamp   **Pangyo, Korea**
Teaching Assistant, Undergraduate level course, 80 students (Instructor: Jaekwang Kim)   *06/2023*

SKKU Summer Data Science BootCamp: Python Programming   **Seoul, Korea**
Teaching Assistant, Undergraduate level course, 20 students (Instructor: Intae Kim)   *07/2020 – 08/2020*