

Saebyeol Shin

Website: <https://saebyeolshin.github.io>

Email: ss4333@cornell.edu

EDUCATION

Cornell University

Ph.D. in Computer Science (*Advisor: Prof. Kilian Q. Weinberger*)

Ithaca, NY, USA

08/2024 – Present

Sungkyunkwan University (SKKU)

B.S. in Data Science

B.S. in Computer Science and Engineering

Honors: *Summa Cum Laude*

Seoul, Korea

03/2019 – 08/2023

PUBLICATIONS

- [S. Shin](#), 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*, [S. Shin](#)*, 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*, [S. Shin](#)*, 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.
- [S. Shin](#), SS. Woo. “**Deepfake Detection using Effective Mask Attention.**” Korean Artificial Intelligence Association (KAIA), 2023.
- G. Lee, [S. Shin](#), and SS. Woo. “**Accelerating CNN via Dynamic Pattern-based Pruning Network.**” ACM International Conference on Information & Knowledge Management (CIKM), 2022.
- G. Lee, [S. Shin](#), and SS. Woo. “**Efficient Multi-Scale Feature Generation Network.**” Korea Computer Congress (KCC), 2022.
- S. Lee*, D. Ko*, J. Park, [S. Shin](#), 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, [S. Shin](#), 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.

* denotes equal contribution

RESEARCH EXPERIENCE

Visual Informatics Group (VITA) @ University of Texas at Austin

Research Intern (*Advisor: Prof. Zhangyang “Atlas” Wang*)

Austin, TX, USA

07/2023 – 03/2024

- Investigated the impact of “essential sparsity” on the robustness of Large Language Models (LLMs), revealing how adversarial robustness is affected by network compression in pre-trained transformers.

Data-driven AI & Security HCI Lab (DASH) @ SKKU

Research Assistant (*Advisor: Prof. Simon S. Woo*)

Suwon, Korea

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; Patent No. 10-2023-0038133 (Issued: Mar. 3, 2023)
- 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

Modeling & Application Development 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 independence movements, Korean War, and democratization protests.
- 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; Patent No. 10-2023-0000445 (Issued: Jan. 2, 2023)

PROJECT EXPERIENCE

Restoring grayscale images of Korean War Veterans using AI Technology.

Ministry of Patriots and Veterans Affairs (MPVA)

Research on Image Colorization & Super Resolution (MOU project)

02/2023 – 06/2023

- Developed AI technology for restoring historical images of Korean War Veterans.

Object Detection in Satellite Images

Hanwha System/ICT

Industry-Academic Cooperation Researcher

05/2022 – 09/2022

- Contributed to the development of a rotated object detection network on satellite SAR datasets.
- “Real-time rotated object detection model for SAR image”, SW copyright No. C-2022-049663 (Issued: Dec. 1, 2022)

Solving Mathematical Problems using NLP Technology

Institute for ICT Promotion (IITP)

Researcher, 5th AI Grand Challenge

07/2021 – 05/2022

- Constructed efficient deep learning models to solve mathematical problems that understand the context of natural language with improved inference speed compared to existing deep learning models.
- Distributed open-source software such as web and applications and demonstrated the solutions for math problems.

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 in various real-world scenarios for the robust detection of fallen people.
- Published a research paper on the usefulness of the dataset to research fallen person detection, which can further extend to other applications such as intelligent CCTV or 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*

PROFICIENCY IN SKILLS

Computer/Programming: Python, C, JAVA, R, LaTeX (all advanced)

Languages: Korean (native fluency), English (full professional proficiency)

TEACHING EXPERIENCE

K-Software Empowerment BootCamp

Teaching Assistant, Undergraduate level course, 80 students (Instructor: Jaekwang Kim)

Pangyo, Korea

06/2023

SKKU Summer Data Science BootCamp: Python Programming

Teaching Assistant, Undergraduate level course, 20 students (Instructor: Intae Kim)

Seoul, Korea

07/2020 – 08/2020

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

SKKU Convergence Project for Smart University Life during COVID-19

Team Leader

Seoul, Korea

07/2020 – 09/2020

- Provided "Take Eat Easy," a group food order service to reduce the burden of expensive delivery fee for students.

SKKU Institute of Broadcast Research

Member, Content Planning Department

Seoul, Korea

03/2019 – 03/2020

- Studied and filmed short movies and commercials with team members.
- Organized and participated in various campus activities and events such as welcoming party and student festivals.

SKKU Global Buddy Program

Global Buddy Assistant Leader

Seoul, Korea

09/2019 – 12/2019

- Assisted exchange and international students adjust to the Korean culture, society, and university campus life.