

# Saebyeol Shin

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

Email: [toquf930@g.skku.edu](mailto:toquf930@g.skku.edu)

## EDUCATION

### 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-CoViT: 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

Austin, TX, USA

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

07/2023 – Present

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

Suwon, Korea

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; 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.

Research on Image Colorization & Super Resolution (MOU project)

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

Ministry of Patriots and  
Veterans Affairs (MPVA)

02/2023 – 06/2023

### Object Detection in Satellite Images

Industry-Academic Cooperation Researcher

- 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)

Hanwha System/ICT

05/2022 – 09/2022

### Solving Mathematical Problems using NLP Technology

Researcher, 5<sup>th</sup> AI Grand Challenge

- 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.

Institute for ICT Promotion (IITP)

07/2021 – 05/2022

### Abnormal Behavior Detection in CCTV using Object Detection Algorithm

Researcher, 4<sup>th</sup> AI Grand Challenge

- 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.

IITP

06/2021 – 12/2021

## AWARDS AND HONORS

### [Awards]

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

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### **SKKU Convergence Project for Smart University Life during COVID-19**

**Seoul, Korea**

*Team Leader*

*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**

**Seoul, Korea**

*Member, Content Planning Department*

*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**

**Seoul, Korea**

*Global Buddy Assistant Leader*

*09/2019 – 12/2019*

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