Saebyeol Shin

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EDUCATION

Sungkyunkwan University (SKKU) **Seoul, Korea**
B.S. in Computer Science and Engineering *03/2019 – 08/2023*
B.S. in Data Science
Honors: ***Summa Cum Laude,*** Cumulative GPA: 4.17/4.5 (96.7%)

PUBLICATIONS

1. S. Shin, A. Jaiswal, S. Liu, and Z. Wang. **"Essential Sparsity Emerges in Large Language Models for Robustness Too."** (Preprints in Progress), 2024.
2. 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.
3. 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.
4. S. Shin, SS. Woo. "**Deepfake Detection using Effective Mask Attention.**" Korean Artificial Intelligence Association (KAIA), 2023.
5. G. Lee, S. Shin, and SS. Woo. **"Accelerating CNN via Dynamic Pattern-based Pruning Network."** ACM International Conference on Information & Knowledge Management (CIKM), 2022.
6. G. Lee, S. Shin, and SS. Woo. **"Efficient Multi-Scale Feature Generation Network."** Korea Computer Congress (KCC), 2022.
7. S. Lee*, D. Ko*, J. Park, S. Shin, D. Hong, and SS. Woo. **"Deepfake Detection for Fake Images with Facemasks."**ACM Works hop on the Security Implications of Deepfakes and Cheapfakes (WDC), 2022.
8. 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.

* Equal contributions

RESEARCH EXPERIENCE

Visual Informatics Group (VITA) @ University of Texas at Austin **Austin, Texas**
Research Assistant (Advisor: Prof. Zhangyang "Atlas" Wang) *07/2023 – Current*

- 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. **Ministry of Patriots and Veterans Affairs (MPVA)**
Research on Image Colorization & Super Resolution (MOU project)
- 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*
- 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*

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*

PROFICIENCY IN SKILLS

Computer/Programming: Python, C, JAVA, R, LaTeX (all advanced)
Languages: Korean (native fluency), English (full professional proficiency) – IBT TOEFL: 101 (R27/L27/S23/W24)

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

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.

REFERENCES

Zhangyang (Atlas) Wang [web] *Associate Professor* The University of Texas at Austin Department of Electrical and Computer Engineering Email: atlaswang@utexas.edu	**Simon S. Woo** [web] *Associate Professor* Sungkyunkwan University Department of Artificial Intelligence Email: swoo@g.skku.edu	**Janghyun Kim** [web] *Professor & Department Chair* Sungkyunkwan University Department of Interaction Science & School of Convergence Email: alohakim@skku.edu