Seulgi Kim

391 17th St NW, ATL, GA 30363 | + 1 (770) 312-3174 | seulgi.kim@gatech.edu | Website | LinkedIn | Google Scholar

Education

Georgia Institute of Technology | Atlanta, GA, USA

Ph.D. in Electrical and Computer Engineering, minor in Computer Science *Aug. 2024 – Present*
MS. In Electrical and Computer Engineering *Aug. 2023 – Aug. 2024*

Seoul National University | Seoul, Korea

BS in Biosystems Engineering, minor in Computer Science *March 2016 - Feb. 2021*

Research Interests

Multi-modal Learning, Computer Vision, Diffusion, Large Language Model (LLM), Vision Language Model (VLM), Reasoning, Action Anticipation, Video Understanding

Publications

Journal

1. Kaviani, G., Yarici, Y., **Kim, S.**, Prabhushankar, M., AlRegib, G., Solh, M., Patil, A., 2025. *Hierarchical and Multimodal data for daily activity understanding,* Submitted at DMLR [Paper] [Youtube] [Project]

Conference

1. **Kim, S.,** Prabhushankar, M., AlRegib, G., 2025. *IntenDiff: Hierarchical Intention Diffusion for Action Anticipation.* Submitted at CVPR
2. Huang, J., **Kim, S.,** Liu, Y., Shen, Y., Zhu, H., Tiwari, P., Rudinac, S., Kanoulas, E., 2025, *A Novel Automatic Framework for Speaker Drift Detection in Synthesized Speech.* Submitted at ICASSP
3. Huang, J., **Kim, S.,** Liu, Y., Shen, Y., Wang, C., Tiwari, P., Yang, J., Kanoulas, E., 2025, *Towards LLM-based Human-like Evaluation of Speaker Similarity.* Submitted at ICASSP
4. **Kim, S.,** Kokilepersaud, K., Prabhushankar, M., AlRegib, G., 2025. *Countering Multi-modal Representation Collapse through Rank-targeted Fusion.* WACV [Paper] [Project]
5. **Kim, S.,** Kaviani, G., Prabhushankar, M., AlRegib, G., 2025. *Multi-level and Multi-modal Action Anticipation.* ICIP [Paper] [Youtube] [Project]
6. Kokilepersaud, K., **Kim, S.,** Prabhushankar, M., AlRegib, G., 2024. *HEX: Hierarchical Emergence Exploitation in Self-Supervised Algorithms.* WACV [Paper] [Youtube]

Patents

1. **S. Kim,** R. Kang, M. Son, H. Woo, D. Jeon, "*Apparatus and Method for Determining a Position of an Object outside a Vehicle*", **US 18/ 538,386**, 2023. 12. 13., Main Inventor
2. **S. Kim,** M. Son, "*Method and Apparatus for Multi-camera based Road Facility*", **KR 1020230178910**, 2023. 12. 11., Main Inventor
3. R. Kang, **S. Kim**, M. Son, H. Woo, D. Jeon, "*Apparatus for Determining a Height of an object outside a vehicle and a Method for the same*", **US 18/ 505,816**, 2023. 11. 9.
4. **S. Kim,** R. Kang, M. Son, H. Woo, D. Jeon, "*Method and Apparatus for Determining Vehicle Location based on License Plate Recognition*", **KR 1020230087663**, 2023. 7. 6., Main Inventor
5. **S. Kim,** R. Kang, M. Son, H. Woo, D. Jeon, "*Apparatus for Determining of Object Position outside Vehicle and Method Thereof*", **KR 1020230071042**, 2023. 6. 1., Main Inventor
6. R. Kang, **S. Kim**, M. Son, H. Woo, D. Jeon, "*Apparatus for Determining of Object Position outside Vehicle and Method Thereof*", **KR 1020230062646**, 2023. 5. 15.
7. **S. Kim,** Y. Kang, "*Apparatus for Predicting a Driving Path of a Vehicle and a Method Thereof*", **US 18/ 142,677**, 2023. 5. 3., Main Inventor
8. **S. Kim,** Y. Kang, "*Apparatus for Training a Path Prediction Model and a Method Thereof*", **US 18/ 136,687**, 2023. 4. 19., Main Inventor
9. **S. Kim,** "*Apparatus for Detecting Label Errors in Training Datasets and Method Thereof*", KR 1020230025347, 2023. 2. 24.
10. **S. Kim,** Y. Kang, "*Apparatus for Predicting Driving Path of Vehicle and Method Thereof*", **KR 1020220145334**, 2022. 11. 7., Main Inventor
11. **S. Kim,** Y. Kang, "*Apparatus for Training Path Prediction Model and Method Thereof*", **KR 1020220145335**, 2022. 11. 7., Main Inventor
12. Y. Song, **S. Kim,** H. Lee, K. Nam*, "Method for Controlling Seat Position based Learning*", KR 1020210160162, 2021. 11. 20.

Book

1. **S. Kim,** J. Park, "*From the First to the Tenth Steps of Statistics (Across Mathematics, Computer Science, and Economics)*", Festbook, ISBN 979-11-92190-14-395140 (VOL 1), 2023. 4. 11.

Work Experience (Selected)

Amazon | Austin, TX, USA   *May. 2024 – Aug. 2024*
  Software Development Engineering (SDE) Intern
- Developed a generative AI model that auto-tag the root causes of 1000+ seller inquiries.
- Built a chatbot to be used by 100+ AWS Partner Organization (APO) developers using Claude 3 Sonnet LLM.
- Fixed the team's PSF pipelines; identified the root causes that cause failure and rolled out to production stages.

Hyundai Motors Company | Seoul, Korea   *Feb. 2021 – Sep. 2023*
  Research Engineer / Autonomous Driving Software Development Team
- Represented real-world 3D structures to detect roads and road markers using monocular camera and 3D geometrics.
- Responsible for the entire perception pipeline for the Level 4 self-driving pilot service, including dataset creation, neural network implementation, post-processing with 3D camera geometry, and evaluation. Launched on Hyundai Robo-Taxi, Robo-Shuttle, and Robo-Trucks services. [Youtube]
- Received 12 Patents and an in-house conference reward (**Excellence Paper (Top 10)**, first author) by fusing the LiDAR and Camera modalities. [Certificate]
- Built a debugging monitor from scratch using Qt5 to communicate with embedded systems via TCP/IP.
- Processed raw data acquired from camera, LiDAR, and CAN bus sensors to train AI models.

Research Projects

Can VLMs Understand Fine-grained Actions in Video? / Georgia Tech   *Aug. 2025 – Present*
- Fine-tuned VLM's chain-of-thought process with reinforcement learning for fine-grained action anticipation.
- Design reinforcement learning algorithms for capturing fine-grained actions in Video.

Do Vision Language Action (VLA) Models Lack Basic Reasoning? [PDF] / Georgia Tech   *May. 2025 – Aug. 2025*
- Co-Fine-tuned VLA models using a mixture of VQA and robotics dataset to improve reasoning capabilities.
- Evaluated on downstream robotics tasks within the LIBERO evaluation suite, improving action accuracy.

DARai: Human Action Activity Dataset [Project] / Georgia Tech   *Aug. 2024 – April. 2025*
- Created the human activity dataset from scratch to support research in activity recognition/anticipation tasks.

Auto-tagging Seller Inquiries with LLM / Amazon   *May. 2024 – Aug. 2024*
- Used prompt engineering techniques with Claude 3 Sonnet LLM to classify the root causes of 1000+ inquiries.
- Reached a 78% overall accuracy rate and a >90% accuracy rate on 5 categories based on manual evaluation.

ADAS Production Car Development [Youtube] / Hyundai Motors Company   *Feb. 2021 – Sep. 2023*
- Tested, integrated, and embedded our team's AI models and detection algorithms into NVIDIA chips.
- Rectified localization error and enhanced distance estimation using a single camera, slated for 2025 release.

Teaching Experience

Graduate Teaching Fellow / Georgia Institute of Technology   *Jan. 2025 – May. 2025*
Graduate Teaching Assistant / Georgia Institute of Technology   *Jan. 2024 – Dec. 2024*
- Developed ECE 2806 (AI First) course content from scratch to be given to undergraduate students.
- Lectured ECE2806 (AI First) Lab class and Recitation class for 2nd year undergraduate students.

Honors and Awards (Selected)

2025 GTA Excellence Award / Georgia Tech Roger P. Webb Awards Program   *March. 2025*
- 1,000 dollars and plaque as an outstanding GTA (Top 3). [Link]

2025 Outstanding GTA award / Georgia Institute of Technology   *March. 2025*
- Outstanding GTA (Top 1) in ECE department.

Research Scholar / Hyundai Motors Company   *Jan. 2020 – Dec. 2020*
- Full tuition and stipend for 1 year. [Project demo]

Merit-based Scholarship (7 semesters) / Seoul National University   *Jan. 2017 – Dec. 2020*
- Merit-based scholarship for 7 semesters throughout the undergraduate.

Skills

Programming: C++, Python, C, MATLAB, R, Java, OCaml, PHP, HTML
Tools: Open3D, CAN, TCP/IP, PyTorch, Tensorflow, TensorRT, Keras, Cuda Programming, OpenMP, OpenGL, AWS, Git, JIRA, Docker, Raspberry PI, Arduino, Android Studio, SolidWorks