SeongHyeon MOON

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RESEARCH INTERESTS

Keywords: *Computer Vision, Object Segmentation, Vision Language Model*
- Integrating visual and textual data to improve object detection, segmentation, and tracking.

EDUCATION

MAY 2024 SEP 2018	***Doctor of Philosophy* - Computer Science** Rutgers, The State University of New Jersey **Adviser:** Mubbasir Kapadia Dissertation: Maximize Utilization of Support-Set for Few-shot Segmentation	**New Brunswick, NJ, USA**
FEB 2017 MAR 2015	***Master of Science* - Mechanical Engineering** Gwangju Institute of Science and Technology (GIST) **Adviser:** Kwanghee Ko Thesis: Parameterization of Unorganized Cylindrical 3D-Point Clouds for Surface Fitting	**Gwangju, KOR**
FEB 2015 MAR 2009	***Bachelor of Science* - Industrial and Information System Engineering (IISE)** Seoul National University of Science and Technology Graduated with the highest honor (**Rank 1**/45)	**Seoul, KOR**

WORK EXPERIENCE

PRESENT MAR 2025	***Roblox*** **Senior Software Engineer** in Core AI. • Topic: TBD	**San Mateo, CA, USA**
MAR 2025 JUL 2024	***Brookhaven National Laboratory*** **Research Associate** in AI Dept. • Topic: Few-shot Segmentation with Vision Language Model (VLM) • Achieved state-of-the-art performance on the Few-shot Segmentation (FSS) with a new novel way to extract feature information.	**Upton, NY, USA**
AUG 2023 MAY 2023	***Roblox*** **Research Intern** in Core AI. • Topic: Real-Time Body Movement Tracking • Improve the efficiency and precision of the human pose estimation model.	**San Mateo, CA, USA**
AUG 2022 MAY 2022	***NEC Laboratories America*** **Research Intern** in Machine Learning Dept. • Topic: Multi-camera Multi-object Tracking • Developed a novel association technique that integrates visual features with location data.	**Princeton, NJ, USA**
AUG 2020 JUN 2020	***DeepMotion*** **Research Intern** in Research Group. • Topic: Controlling a humanoid model using reinforcement learning • Hierarchical reinforcement learning was applied to train a high-level policy that directs a complex human agent to navigate to a specific location.	**San Mateo, CA, USA**
AUG 2019 JUN 2019	***AutoDesk*** **Software Engineer Intern** in Autodesk Research. • Topic: Human behavior simulation in a building • Integrated SyDEVS and SteerSuite into an open-source C++ framework, SyDEVS-Building, for simulating human behaviors in an office building.	**Toronto, ON, CAN**

HONORS & AWARDS

- Andrew Kim Memorial Foundation Fellowship, **Northeast Regional Conference (NRC), 2024**
- Korean Government Scholarship (Tuition and Stipend), Gwangju Institute of Science and Technology, 2015, 2016
- Graduated with the highest honor from the department of IISE at Seoul National University of Science and Technology, 2015
- High G.P.A., Seoul National University of Science and Technology, 2010

SKILLS

Python, C++, C, Pytorch, OpenCV, Unity, Ubuntu, etc.

SELECTED PUBLICATIONS

JOURNAL ARTICLES *Equal contribution

[3] ***JOIN: an integrated platform for joint simulation of occupant-building interactions***
Architectural Science Review, 2019
*Seonghyeon Moon, *Davide Schaumann, Muhammad Usman, Rhys Goldstein, Simon Breslav, Azam Khan, Petros Faloutsos, and Mubbasir Kapadia

[2] ***Dynamic Correction of Image Distortions for a Kinect-Projector System***
Journal of WSCG, 2018
Jihoon Park, Seonghyeon Moon, and Kwanghee Ko

[1] ***A point projection approach for improving the accuracy of the multilevel B-spline approximation***
Journal of Computational Design and Engineering, 2018
Seonghyeon Moon and Kwanghee Ko

CONFERENCE PAPERS *Equal contribution (Top conferences are highlighted in red)

[10] ***FCC: Fully Connected Correlation for Few-Shot Segmentation***
Under Review
Seonghyeon Moon, Haein Kong, Muhammad Haris Khan, Yuewei Lin

[9] ***Judging from Support-set: A New Way to Utilize Few-Shot Segmentation for Segmentation Refinement***
Under Review
Seonghyeon Moon, Qingze Liu, Haein Kong, Muhammad Haris Khan

[8] ***Learning from Synthetic Human Group Activities***
Conference on Computer Vision and Pattern Recognition (CVPR 2024) - 24% Acceptance rate
Che-Jui Chang, Danrui Li, Deep Patel, Parth Goel, Honglu Zhou, Seonghyeon Moon, Samuel S. Sohn, Sejong Yoon, Vladimir Pavlovic, Mubbasir Kapadia

[7] ***MSI: Maximize Support-Set Information for Few-Shot Segmentation***
The 19th International Conference on Computer Vision (ICCV 2023) - 26% Acceptance rate
Seonghyeon Moon, Samuel S Sohn, Honglu Zhou, Sejong Yoon, Vladimir Pavlovic, Muhammad Haris Khan, Mubbasir Kapadia

[6] ***HM: Hybrid Masking for Few-Shot Segmentation***
The 17th European Conference on Computer Vision (ECCV 2022) - 28% Acceptance rate
Seonghyeon Moon, Samuel S Sohn, Honglu Zhou, Sejong Yoon, Vladimir Pavlovic, Muhammad Haris Khan, Mubbasir Kapadia

[5] ***Harnessing Fourier Isovists and Geodesic Interaction for Long-Term Crowd Flow Prediction***
The 31st International Joint Conference on Artificial Intelligence (IJCAI 2022) - 15% Acceptance rate
Samuel S Sohn, Seonghyeon Moon, Honglu Zhou, Mihee Lee, Sejong Yoon, Vladimir Pavlovic, Mubbasir Kapadia

[4] ***MUSE-VAE: Multi-Scale VAE for Environment-Aware Long Term Trajectory Prediction***
Conference on Computer Vision and Pattern Recognition (CVPR 2022) - 25% Acceptance rate
Mihee Lee, Samuel S Sohn, Seonghyeon Moon, Sejong Yoon, Mubbasir Kapadia, Vladimir Pavlovic

[3] ***Laying the Foundations of Deep Long-Term Crowd Flow Prediction***
The 16th European Conference on Computer Vision (ECCV 2020) - 27% Acceptance rate
Samuel S Sohn, Honglu Zhou, Seonghyeon Moon, Sejong Yoon, Vladimir Pavlovic, Mubbasir Kapadia

[2] ***Toward a Multi-Level and Multi-Paradigm Platform for Building Occupant Simulation***
Symposium on Simulation for Architecture and Urban Design (SimAUD 2019)
*Seonghyeon Moon, *Davide Schaumann, Muhammad Usman, Rhys Goldstein, Simon Breslav, Azam Khan, Petros Faloutsos, Mubbasir Kapadia

[1] ***Parameterization of unorganized cylindrical point clouds for least squares B-spline surface fitting***
25th Conference in Central Europe on Computer Graphics, Visualization and Computer Vision (WSCG2017)
Seonghyeon Moon, Jin-Eon Park and Kwanghee Ko