

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

WORK EXPERIENCE

PRESENT	<i>Brookhaven National Laboratory</i>	Upton, NY, USA
JUL 2024	Research Associate in AI Dept. <ul style="list-style-type: none">• 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.	
AUG 2023	<i>Roblox (Passed internal ETR review for full time consideration)</i>	San Mateo, CA, USA
MAY 2023	Research Intern in Core AI. <ul style="list-style-type: none">• Topic: Real-Time Body Movement Tracking• Improve the efficiency and precision of the human pose estimation model.	
AUG 2022	<i>NEC Laboratories America</i>	Princeton, NJ, USA
MAY 2022	Research Intern in Machine Learning Dept. <ul style="list-style-type: none">• Topic: Multi-camera Multi-object Tracking• Developed a novel association technique that integrates visual features with location data.	
AUG 2020	<i>DeepMotion</i>	San Mateo, CA, USA
JUN 2020	Research Intern in Research Group. <ul style="list-style-type: none">• 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.	
AUG 2019	<i>AutoDesk</i>	Toronto, ON, CAN
JUN 2019	Software Engineer Intern in Autodesk Research. <ul style="list-style-type: none">• 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.	

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