

SeongHyeon MOON

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RESEARCH INTERESTS

Keywords: *Crowd Analysis, Object Segmentation, Object Tracking, Computer Vision, Deep Learning*

- Detect groups or objects and predict future movement and density, and track them.
- 3D-point clouds, 2D-image and video based computer vision challenges

EDUCATION

PRESENT SEP 2018	<i>Doctor of Philosophy - Computer Science</i> Rutgers, The State University of New Jersey Adviser: Mubbasir Kapadia	New Brunswick, NJ, USA
FEB 2017 MAR 2015	<i>Master of Science - Mechanical Engineering</i> 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	<i>Bachelor of Science - Industrial and Information System Engineering</i> Seoul National University of Science and Technology Graduated with the highest honor (Rank 1/45)	Seoul, KOR

WORK EXPERIENCE

AUG 2023 MAY 2023	<i>Roblox</i> AI Research Intern at Roblox Research Mentor: Mubbasir Kapadia <ul style="list-style-type: none">• Topic: Real-time Body Movement Tracking	San Mateo, CA, USA
AUG 2022 MAY 2022	<i>NEC Laboratories America</i> Research Intern at Machine Learning Dept. Mentor: Alexandru Niculescu-Mizil , Iain Melvin <ul style="list-style-type: none">• Topic: Multi-camera Multi-object Tracking• Devised a new association method combining visual features with location information	Princeton, NJ, USA
AUG 2020 JUN 2020	<i>DeepMotion</i> Research Intern in Research Group. Mentor: Kevin He <ul style="list-style-type: none">• Topic: Controlling a humanoid model using reinforcement learning• Hierarchical reinforcement learning was utilized and trained a high-level policy to control a complex human agent to move a specific location	San Mateo, CA, USA
AUG 2019 JUN 2019	<i>AutoDesk</i> Software Engineer Intern in Autodesk Research. Mentor: Rhys Goldstein <ul style="list-style-type: none">• Topic: Human behavior simulation in a building• Combined the two frameworks (SyDEVs and SteerSuite) and made an open-source C++ framework(SyDEVs-Building) generating human behaviors in an office building	Toronto, ON, CAN

HONORS & AWARDS

- Korean Government Scholarship (Tuition waive and Stipend), Gwangju Institute of Science and Technology, 2015, 2016
- Graduated with the highest honor in the department of IISE, Seoul National University of Science and Technology, 2015
- High G.P.A., Seoul National University of Science and Technology, 2010

SKILLS

Python, C++, C, Java, Pytorch, OpenCV, OpenGL, Unity, Ubuntu, Solidity, MATLAB, etc.

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

- [9] | ***MSI: Maximize Support-Set Information for Few-Shot Segmentation***
International Conference on Computer Vision (**ICCV 2023**)
Seonghyeon Moon, Samuel S Sohn, Honglu Zhou, Sejong Yoon, Vladimir Pavlovic, Muhammad Haris Khan, Mubbasir Kapadia
- [8] | ***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
- [7] | ***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
- [6] | ***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
- [5] | ***A2X: An Agent and Environment Interaction Benchmark for Multimodal Human Trajectory Prediction***
Motion, Interaction and Games (MIG 2021)
Samuel S Sohn, Mihee Lee, Seonghyeon Moon, Gang Qiao, Usman Muhammad, Sejong Yoon, Mubbasir Kapadia
- [4] | ***Deep Integration of Physical Humanoid Control and Crowd Navigation***
Motion, Interaction and Games (MIG 2020)
Brandon Haworth, Glen Berseth, Seonghyeon Moon, Petros Faloutsos, Mubbasir Kapadia
- [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

CONFERENCE WORKSHOP

- [2] | ***Multi-Agent Hierarchical Reinforcement Learning for Humanoid Navigation***
Deep Reinforcement Learning Workshop (**NeurIPS 2019**)
Glen Berseth, Brandon Haworth, Seonghyeon Moon, Mubbasir Kapadia, Petros Faloutsos
- [1] | ***Deep Crowd-Flow Prediction in Built Environments***
Artificial Intelligence for Humanitarian Assistance and Disaster Response Workshop (**NeurIPS 2019**)
Samuel S Sohn, Seonghyeon Moon, Honglu Zhou, Sejong Yoon, Vladimir Pavlovic, Mubbasir Kapadia