Seonghyeon Moon

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EDUCATION

Rutgers University Aug. 2018 - Present

- Ph.D. in Computer Science New Jersey, United States

  Adviser: Professor Mubbasir Kapadia

  Field of Study: Human Crowd Behavior Modeling

Gwangju Institute of Science and Technology Mar. 2015 - Feb. 2017

- M.S. in Mechanical Engineering Gwangju, South Korea

  Adviser: Professor Kwanghee Ko

  Thesis: Parameterization of Cylindrical Unorganized Point Clouds for Surface Fitting

  Field of Study: Geometric Modeling and Projection Mapping

Northumbria University Mar. 2009 - Feb. 2015

- B.S. in Manufacturing and Systems Design Engineering Newcastle, U.K.

  Graduated with First Class Honours

Seoul National Univerisity of Science and Technology Mar. 2009 - Feb. 2015

- B.S. in Industrial and Information Systems Engineering Seoul, South Korea

  Graduated with the highest honor (Ranked 1st)

PUBLICATIONS

JOURNAL ARTICLES

*Equal contribution

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

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

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

CONFERENCE PAPERS

[4] Brandon Haworth, Glen Berseth, Seonghyeon Moon, Petros Faloutsos, Mubbasir Kapadia, "Deep Integration of Physical Humanoid Control and Crowd Navigation", *Motion, Interaction and Games (MIG)*, Online, Oct. 2020.

[3] S. Sohn, H. Zhou, S. Moon, S. Yoon, V. Pavlovic, M. Kapadia, "Laying the Foundations of Deep Long-Term Crowd Flow Prediction", *The 16th European Conference on Computer Vision (ECCV)*, Online, Jun. 2020.

[2] *Davide Schaumann, *Seonghyeon Moon, Muhammad Usman, Rhys Goldstein, Simon Breslav, Azam Khan, Petros Faloutsos, Mubbasir Kapadia, “Toward a Multi-Level and Multi-Paradigm Platform for Building Occupant Simulation”, *Symposium on Simulation for Architecture and Urban Design*, Atlanta, United States, Apr. 2019.

[1] Seonghyeon Moon, Jin-Eon Park and Kwanghee Ko, “Parameterization of unorganized cylindrical point clouds for least squares B-spline surface fitting”, in *25th International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision 2017 (WSCG2017)*, Plzen, Czech Republic, May. 2017. [Link]

POSTERS & WORKSHOP

[4] Glen Berseth, Brandon Haworth, Seonghyeon Moon, Mubbasir Kapadia, Petros Faloutsos , “Multi-Agent Hierarchical Reinforcement Learning for Humanoid Navigation”, in *Deep Reinforcement Learning Workshop (NeurIPS 2019)*, Vancouver, Canada, Dec. 2019.

[3] Samuel S Sohn, Seonghyeon Moon, Honglu Zhou, Sejong Yoon, Vladimir Pavlovic, Mubbasir Kapadia, “Deep Crowd-Flow Prediction in Built Environments”, in *Artificial Intelligence for Humanitarian Assistance and Disaster Response Workshop (NeurIPS 2019)*, Vancouver, Canada, Dec. 2019.

[2] Jihoon Park, Seonghyeon Moon and Kwanghee Ko, “Automatic Geometry Correction for a Kinect-Projector system in Dynamic Environment”, in *Workshop on Virtual Reality Interaction and Physical Simulation (VRIPHYS 2018)*, Delft, Nedtherlands, Apr. 2018.

[1] S.H. Moon, J.H. Park and K.H. Ko, “Adaptive Method for 2.5D Scattered Point Approximation”, in *23rd ACM Symposium on Virtual Reality Software and Technology (VRST2017)*, Gothenburg, Sweden, Nov. 2017. [Link]

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 Univerisity of Science and Technology, 2015
- High G.P.A., Seoul National Univerisity of Science and Technology, 2010

WORK EXPERIENCE

Intelligent Visual Interfaces Laboratory Aug. 2018 - Present
Rutgers University New Jersey, United States
Graduate Assistant (Adviser : Professor Mubbasir Kapadia)

- Participating in a Long Term Crowd Flow prediction project
  - -Deep-learning approach Autoencoder architecture is utilized
  - -Training a model and generating a crowd density heat-map
  - -Submitted a workshop paper to NeurIPS 2019 and accepted
- Participated in a Crowd simulation using Reinforcement Learning project
  - -Trained a human model to follow motion capture data
  - -Visualized human agents and verified results
  - -Submitted a workshop paper to NeurIPS 2019 and accepted

DeepMotion Research Group Jun. 2020 - Aug. 2020
DeepMotion San Francisco, United States
Research Intern (Adviser :Kevin He)

- Participated in a project on controlling a humanoid model
  - -Hierarchical reinforcement learning was utilized
  - -Trained a high-level policy to control a complex human agent to move a specific location

Autodesk Research (Complex System Group) Jun. 2019 - Aug. 2019
Autodesk in Toronto Toronto, Canada
Software Engineer Intern (Adviser : Rhys Goldstein)

- Participated in a project on human behavior simulation in a building
  - -Combined the two frameworks (SyDEVS and SteerSuite)
  - -Made an open-source C++ framework(SyDEVS-Building), generating human behaviors in an office building

Modeling and Simulation Laboratory Jan. 2018 - May. 2018
Gwangju Institute of Science and Technology Gwangju, South Korea
Research Intern (Adviser : Professor Kwanghee Ko)

- Led a project on an IMU human tracking using a smartphone
  - -Identified and checked project progress and set the overall direction
  - -Implemented the Extended Kalman Filter algorithm for an IMU sensor
  - -Implemented a new guideline concept for improving the accuracy of the tracking

Modeling and Simulation Laboratory Mar. 2015 - Feb. 2017
Gwangju Institute of Science and Technology Gwangju, South Korea
Research Assistant (Adviser : Professor Kwanghee Ko)

- Led a project on projection mapping for a medium object without distortion
  - -Implemented a projector and a Kinect calibration and suggested methods for distortion correction using calibration results
  - -Implemented Kinect depth data acquisition and visualization with PCL (Point Cloud Library) and OpenGL
- Participated in a project on the development of 3D scanning application for plant engineering
  - -Learned and implemented scattered data approximation using Multilevel B-Splines
- Participated in a project on projection mapping for free-form surfaces

TEACHING

Discrete Structures II Spring, 2021
Rutgers University New Jersey, United States
Teaching Assistant
- Reviewed course materials, graded exams, and programming assignments for around 30 undergraduates.

Internet Technology Fall, 2020
Rutgers University New Jersey, United States
Teaching Assistant
- Reviewed course materials, graded exams, and programming assignments for around 40 undergraduates.

Numerical Analysis and Visualization Fall, 2016
Gwangju Institute of Science and Technology Gwangju, South Korea
Teaching Assistant
- Taught MATLAB, graded exams, and programming assignments for around 40 undergraduates.

Physics Fall, 2012
Seoul National Univerisity of Science and Technology Seoul, South Korea
Course Tutor
- Assisted 3 to 4 weak undergraduate students to improve their understanding of physics

CONFERENCE & JOURNAL REVIEWS

2021: CVPR (Conference on Computer Vision and Pattern Recognition)
2020: AAAI (Association for the Advancement of Artificial Intelligence)
2020: TVCG (IEEE Transactions on Visualization and Computer Graphics)

TECHNICAL SKILLS

Advanced : C, C++, Python
Intermediate : MATLAB, Unity
Beginner : HTML, Java, OpenCV

LANGUAGES

- Korean: Native
- English: Fluent