Sangil Lee

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EDUCATION

Seoul National University, Korea, Republic of   Sep. 2017 – present
Ph.D. (ABD) Student in Mechanical and Aerospace Engineering

· Research Focus: 3D Vision in Dynamic Environments for Autonomous Systems, Event Cameras
· Advisor: Professor H. Jin Kim
· Cumulative GPA: 3.67/4.3

Seoul National University, Korea, Republic of   Mar. 2015 – Aug. 2017
M.S. in Mechanical and Aerospace Engineering

· Thesis: Robust Visual Odometry via Rigid Motion Segmentation for Dynamic Environments
· Advisor: Professor H. Jin Kim
· Cumulative GPA: 3.89/4.3

Seoul National University, Korea, Republic of   Mar. 2010 – Feb. 2015
B.S. in Electrical and Computer Engineering

· Thesis: Adaptive Formation Control for Multi-agent Systems
· Advisor: Professor Hyungbo Shim
· GPA: 3.82/4.3 (cumulative) 3.95/4.3 (in major) Cum Laude

PROJECTS

Research on Visual Navigation for Autonomous Vehicle   May. 2016 – Apr. 2020

· Objective: Autonomous visual navigation for unmanned vehicle in dynamic environments
· Organization: SNU-Samsung Smart Campus R&D

RFD Solution Advancement Development   Jun. 2019 – Nov. 2019

· Objective: Recognize target objects and measure the distance using monocular camera and imu
· Organization: Hyundai MnSoft

Adaptive Multimodal Integration for Accuracy Assurance of Navigation Systems Oct. 2016 – Mar. 2017

· Objective: Integration of sensors in an adaptive manner, depending on the context of mission and ambiguity of signal properties
· Organization: Lockheed Martin RoKST&R Initiatives

Development of Construction Sites Mapping with Drones and Images   Jun. 2015 – Jan. 2016

· Objective: Automatic construction site monitoring system using panoramic map generated by drone
· Organization: Hyundai Heavy Industries

EXPERIENCES

Conference Assistant

· International Conference on Control, Automation and Systems   12 Oct. 2021 – 15 Oct. 2021
· Asian Control Conference   4 May 2022 – 5 May 2022

Teaching Assistant

· UAV Decision making, Seoul National University   2015

Sigma Intelligence, Seoul National University
member of robotics club

· Served as club vice president   Mar. 2012 – Feb. 2013
· Served as education director   Mar. 2011 – Feb. 2012

PUBLICATIONS

INTERNATIONAL JOURNALS

Sangil Lee and H. Jin Kim, "Low-latency and Scene-robust Asynchronous Optical Flow Stream and Angular Velocity Estimation," *IEEE Access*, 2021.

Sangil Lee, Chungkeun Lee, Haram Kim, and H. Jin Kim, "Real-time Object-aware Monocular Depth Estimation in Onboard Systems," *International Journal of Control, Automation, and Systems (IJCAS)*, 2020.

INTERNATIONAL CONFERENCES

Howoong Jun, **Sangil Lee**, and Songhwai Oh, "EventPointNet: Robust Keypoint Detection with Neuromorphic Camera Data," *IEEE International Conference on Robotics and Automation (ICRA)*, 2021. (under review)

Sangil Lee, Clark Youngdong Son, and H. Jin Kim, "Robust Real-time RGB-D Visual Odometry in Dynamic Environments via Rigid Motion Model," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.

Sangil Lee, Haram Kim, and H. Jin Kim, "Edge Detection for Event Cameras using Intra-pixel-area Events," *The British Machine Vision Conference (BMVC)*, 2019.

Changhyeon Kim, Pyojin Kim, **Sangil Lee**, and H. Jin Kim, "Edge-based Robust RGB-D Visual Odometry Using 2-D Edge Divergence Minimization," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018.

Sangil Lee and H. Jin Kim, "Real-time Rigid Motion Segmentation using Grid-based Optical Flow," *IEEE International Conference on System, Man, and Cybernetics (SMC)*, 2017.

Changhyeon Kim, **Sangil Lee**, and H. Jin Kim, "Convergence-Enhanced Dense RGB-D Odometry with a Rotational Motion Prior from a Gyroscope," *The 2017 Asian Control Conference (ASCC)*, 2017.

Changhyeon Kim, **Sangil Lee**, Pyojin Kim, and H. Jin Kim, "Time-Efficient Dense Visual 12-DoF State Estimator Using RGB-D Camera," *International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, 2017.

Sangil Lee, P. Jin Kim, Changhyeon Kim, and H. jin Kim, "Depth-based Direct Visual Odometry for Stereo Camera," *Asia-Pacific International Symposium on Aerospace Technology (APISAT)*, 2016.

Sangil Lee, Seung-jae Lee, Jaehyun Park, and H. Jin Kim, "Exposure Correction and Image Blending for Planar Panorama Stitching," *International Conference on Control, Automation and Systems (ICCAS)*, 2016. **(Outstanding Paper Award)**

Sangil Lee and H. Jin Kim, "Detection of 3-Dimensional Textured Object without Depth Information," *14th International Conference on Control, Automation and Systems (ICCAS)*, Korea, October 13-16, 2015.

DOMESTIC JOURNALS

> **Sangil Lee**, P. Jin Kim, Changhyeon Kim, Hyeonbeom Lee, and H. Jin Kim, "Survey on Visual Odometry Technology for Unmanned Systems," *Journal of Institute of Control, Robotics, and Systems*, 23(6):424-431, 2017.

DOMESTIC CONFERENCES

> **Sangil Lee**, Haram Kim, and H. Jin Kim, "Motion Estimation from Asynchronous Optical Flows via Particle Filter," *13th Asian Control Conference*, May 4-7, 2022.

> Haram Kim, **Sangil Lee**, and H. Jin Kim, "Semi-dense Disparity Estimation with an Event and a Frame Camera," *13th Asian Control Conference*, May 4-7, 2022.

> **Sangil Lee**, Haram Kim, Changhyeon Kim, and H. Jin Kim, "Optical Flow Estimation for Event Cameras using Surface of Time Difference Correspondence," *35th Institute of Control, Robotics and Systems*, July 2-4, 2020.

> Changhyeon Kim, **Sangil Lee**, and H. Jim Kim, "Hybrid RGB-D Visual Odometry Combining Edges and Point Features," *35th Institute of Control, Robotics and Systems*, July 2-4, 2020.

> Haram Kim, **Sangil Lee**, and H. Jin Kim, "Cost function for calculating similarity of normalized image patch in heterogeneous cameras," *35th Institute of Control, Robotics and Systems*, July 2-4, 2020.

> **Sangil Lee** and H. Jin Kim, "Image Stitching for 2-D Global Mapping," *31st Institute of Control, Robotics and Systems Annual Conference*, March 10-11, 2016.

> **Sangil Lee** and H. Jin Kim, "Hexa-rotors 3-dimensional Position Control based on Spiral Potential Function with Collision Avoidance," *The Korean Society for Aeronautical & Space Sciences Fall Conference*, November 18-20, 2015.

PATENTS

> Wonhee Lee, **Sangil Lee**, H. Jin Kim, Sunghoon Hong, "Ego Motion Estimation Method and Apparatus," US 16/238,068.

HONORS, AWARDS, SCHOLARSHIPS

· Samsung DS PhD Industrial Scholarship	Mar. 2020 – present
· Encouragement Prize (4th place) at the 24th Samsung Humantech Paper Award	7 Feb. 2018
· Outstanding Paper Award of the Ministry of Trade, Industry, and Energy	18 Oct. 2016
· BK21 plus PhD Fellowship Scholarship	Mar. 2015 – Feb. 2016
· First prize in an 2012 International Capstone Design Fair	Jan. 2012
· Presidential Science Scholarship	Mar. 2010 – Feb. 2014

SKILLS

(Sorted by skillfulness)

Programming	C/C++, Matlab, Javascript, HTML/CSS, Python, Java
Tools/libraries	Vim, Git, WebGL, Three.js, jQuery, ROS
Languages	Korean (native), English
Hardware	Raspberry Pi, Arduino, Basic Spartan FPGA Board
Software	Adobe Photoshop/Premiere, Basic OrCAD, Solidworks, Android Studio