Sangil Lee



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EXPERIENCE

Staff Engineer	
· System LSI, Samsung Electronics	Sep. $2022 - present$
Conference Assistant	
 International Conference on Control, Automation and Systems Asian Control Conference 	12 Oct. 2021 – 15 Oct. 2021 4 May 2022 – 5 May 2022
Teaching Assistant	
\cdot 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
\cdot Served as education director	Mar. $2011 - \text{Feb.} 2012$
EDUCATION	
Seoul National University, Korea, Republic of Ph.D. in Mechanical and Aerospace Engineering	Sep. 2017 – Aug. 2022
 Dissertation: Robust Event-based Angular Velocity Estimation in Dynamic En Advisor: Professor H. Jin Kim Cumulative GPA: 3.67/4.3 	wironments
Seoul National University, Korea, Republic of M.S. in Mechanical and Aerospace Engineering	Mar. 2015 – Aug. 2017
 Thesis: Robust Visual Odometry via Rigid Motion Segmentation for Dynamic Advisor: Professor H. Jin Kim Cumulative GPA: 3.89/4.3 	Environments
Seoul National University, Korea, Republic of B.S. in Electrical and Computer Engineering	Mar. 2010 – Feb. 2015
 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

 $\cdot\,$ Objective: Autonomous visual navigation for unmanned vehicle in dynamic environments

 $\cdot\,$ Organization: SNU-Samsung Smart Campus R&D

RFD Solution Advancement Development

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

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

- \cdot 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

ages Jun. 2015 – Jan. 2016

- $\cdot\,$ Objective: Automatic construction site monitoring system using panoramic map generated by drone
- $\cdot\,$ Organization: Hyundai Heavy Industries

PUBLICATIONS

INTERNATIONAL JOURNALS

Haram Kim, **Sangil Lee**, Junha Kim, and H. Jin Kim, "Real-time Hetero-Stereo Matching for Event and Frame Camera with Aligned Events Using Maximum Shift Distance," *IEEE Robotics and Automation Letters (RA-L)*, 2022.

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," *International Conference on Control, Automation and Systems (ICCAS)*, 2022.

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, 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, 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

\cdot Samsung DS PhD Industrial Scholarship	Mar. 2020 – Aug. 2022
\cdot Encouragement Prize (4th place) at the 24th Samsung Humantech Paper Award	7 Feb. 2018
\cdot Outstanding Paper Award of the Ministry of Trade, Industry, and Energy	18 Oct. 2016
\cdot BK21 plus PhD Fellowship Scholarship	Mar. $2015 - Feb. 2016$
\cdot 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, OpenCV, ROS, WebGL, Three.js, jQuery	
Languages	Korean (native), English	
Hardware	Raspberry Pi, Arduino, Basic Spartan FPGA Board	
Software	Adobe Photoshop/Premiere, Basic OrCAD, Solidworks, Android Studio	