Pyojin Kim, Ph.D.

Contact Information

Room 8002.2, TASC1 Building
8888 University Dr, Burnaby, BC, Canada
Simon Fraser University

Mobile: +1 (778) 917 7355
Homepage: http://pyojinkim.com/
E-mail: pjinkim1215@gmail.com

Research Interests

Visual Odometry & Simultaneous Localization and Mapping, 3D Computer Vision, Deep Learning

Education

Seoul National University, Seoul, South Korea **March, 2013 - February, 2019**

Ph.D. in Mechanical and Aerospace Engineering
Thesis : Low-Drift Visual Odometry and SLAM for Indoor Robotics
Advisor : Prof. H. Jin Kim

Yonsei University, Seoul, South Korea **March, 2009 - February, 2013**

Bachelor in Mechanical Engineering

Work/Academic Experience

Simon Fraser University, Burnaby, BC **July, 2019 - Present**
Postdoctoral Fellow. Working with Prof. Yasutaka Furukawa in GrUVi (Computer Graphics and Vision) Lab.

Google, Mountain View, CA **October, 2018 - December, 2018**
Graduate Student Researcher. Worked with Chao Guo, Ryan DuToit, Daniya Zamalieva, and Leon Wong in ARCore 6-DoF Tracking Team. Developed and analyzed VIO fault detection module for ARCore motion tracking algorithm.

NASA Ames Research Center, Mountain View, CA **June, 2016 - September, 2016**
Graduate Student Researcher. Worked with Brian Coltin, Oleg Alexandrov, and Terry Fong in Intelligent Robotics Group (IRG). Proposed the robust visual localization algorithm in changing lighting conditions for Astrobee, a free-flying robot for the International Space Station (ISS).

Selected Publications

ECCV	European Conference on Computer Vision
CVPR	IEEE International Conference on Computer Vision and Pattern Recognition
BMVC	British Machine Vision Conference
ICRA	IEEE International Conference on Robotics and Automation
IROS	IEEE International Conference on Intelligent Robots and Systems
URAI	IEEE International Conference on Ubiquitous Robots and Ambient Intelligence
SMC	IEEE International Conference on Systems, Man and Cybernetics
APISAT	Asia-Pacific International Symposium on Aerospace Technology
ICROS	The Institute of Control, Robotics and Systems
AURO	Autonomous Robots
IJCAS	International Journal of Control Automation and Systems
JICROS	The Journal of Institute of Control, Robotics and Systems

International Journals

Pyojin Kim, Hyeonbeom Lee, H. Jin Kim, "Autonomous Flight with Robust Visual Odometry under Dynamic Lighting Conditions.", *AURO*, 2018.

Pyojin Kim, Hyon Lim, H. Jin Kim, "Visual Inertial Odometry with Pentafocal Geometric Constraints.", *IJCAS*, 2018.

International Conferences

Pyojin Kim, Brian Coltin, H. Jin Kim, "Linear RGB-D SLAM for Planar Environments.", *ECCV*, 2018. (Acceptance Rate = 776/2439 $\sim$ **31.8%**)

Changhyeon Kim, **Pyojin Kim**, Sangil Lee, H. Jin Kim, "Edge-based Robust RGB-D Visual Odometry Using 2-D Edge Divergence Minimization.", *IROS*, 2018. (Acceptance Rate = 1257/2693 $\sim$ 46.7%)

Pyojin Kim, Brian Coltin, H. Jin Kim, "Indoor RGB-D Compass from a Single Line and Plane.", *CVPR*, 2018. (Acceptance Rate = 979/3309 $\sim$ **29.6%**)

Pyojin Kim, Brian Coltin, H. Jin Kim, "Low-Drift Visual Odometry in Structured Environments by Decoupling Rotational and Translational Motion.", *ICRA*, 2018. (Acceptance Rate = 1030/2539 $\sim$ 40.6%)

Pyojin Kim, Brian Coltin, H. Jin Kim, "Visual Odometry with Drift-Free Rotation Estimation Using Indoor Scene Regularities.", *BMVC*, 2017. (Acceptance Rate = 188/635 $\sim$ **29.6%**)

Changhyeon Kim, Sangil Lee, **Pyojin Kim**, H. Jin Kim, "Time-Efficient Dense Visual 12-DoF State Estimator Using RGB-D Camera.", *URAI*, 2017.

Pyojin Kim, Brian Coltin, Oleg Alexandrov, H. Jin Kim, "Robust Visual Localization in Changing Lighting Conditions.", *ICRA*, 2017. (Acceptance Rate = 933/2278 $\sim$ 41%)

Pyojin Kim, Hyon Lim, H. Jin Kim, "Robust Visual Odometry to Irregular Illumination Changes with RGB-D Camera.", *IROS*, 2015. (Acceptance Rate = 981/2134 $\sim$ 46%)

Pyojin Kim, Hyon Lim, H. Jin Kim, "6-DoF Velocity Estimation Using RGB-D Camera Based on Optical Flow.", *SMC*, 2014.

Honors, Awards, Scholarships

- Teaching Assistant, Introductory Engineering Probability, 2013.
- Teaching Assistant, Flight Dynamics and Control, 2013.
- 15-th KAI Aerospace Paper Award, Korea Aerospace Industries, 2018.
- 24-th HumanTech Paper Award, Samsung Electronics, 2018.
- Best Paper Award, The Korea Navigation Institute Conference, 2015.
- Magna Cum Laude, Yonsei University, 2013.
- Kwanjeong Educational Foundation (KEF) Domestic Scholarship, 2013 $\sim$ 2015.

Patent

Pyojin Kim, H. Jin Kim, "Visual Odometry System and Method Using Structured Environmental Features.", KR 10-2018-0004015.

Pyojin Kim, Hyon Lim, H. Jin Kim, "Visual Odometry System and Method.", KR 10-2016-0108416.

Pyojin Kim, Hyon Lim, H. Jin Kim, "Robust Visual Odometry System and Method to Irregular Illumination Changes.", KR 10-2015-0138558.

Computer Skills

- Languages: MATLAB, C/C++, Java, Swift, Python, LabVIEW.
- Computer-Aided Design: SolidWorks, AutoCAD.