Changyeob Shin

E-mail : changyeobshin@gmail.com
Personal website : changyeobshin.com

EDUCATION

- **University of California, Los Angeles, USA** 2020.06 (Expected)
  Ph.D. in Mechanical Engineering (Systems and Control, Robotics)
- **Korea University, Seoul, Korea** 2015. 08
  M.E. in Mechanical Engineering
- **Korea University, Seoul, Korea** 2013. 08
  B.E. in Electrical Engineering

RESEARCH INTERESTS

Robotics, Control, Computer Vision, Machine Learning

RESEARCH AND WORK EXPERIENCE

● Graduate Research Projects

Automation of Surgical Subtasks with Cable Driven Surgical Robots (Raven-IV) 2015.09 ~
- Develop path planning algorithms of surgical robots with optimization and machine learning algorithms
- Visual servo control of surgical robots with computer vision and sensor fusion algorithms.

Bionics Lab (Prof. Jacob Rosen), UCLA

Shoulder Mounted Manipulator Collaborating with Worker 2014.07 ~ 2015.08
- Implement position and force maintaining control under motion of worker
- Performance evaluation with Motion Capture System

Mechatronics and Field Robotics Lab (Prof. Daehie Hong), Korea University

Building Maintenance Robot 2013.09 ~ 2015.04
- Implement force control of cleaning tool system through DSP embedded system
- Design embedded control board for cleaning tool system

Mechatronics and Field Robotics Lab (Prof. Daehie Hong), Korea University

Robotic Carrier Platform for Windmill Blade Maintenance 2013.07 ~ 2013.08
- Propose algorithm for horizontal attitude regularization of robotic carrier platform
- Implement the algorithm with DSP embedded system

Mechatronics and Field Robotics Lab (Prof. Daehie Hong), Korea University

● Undergraduate Thesis

D* Path Planning Algorithm for Mobile Robots with a Variable Sensor Range 2012.09 ~ 2012.12
- Propose path planning algorithm which can be used with variable sensor range in grid map
- Provide sensor selection criteria based on simulation result

With Prof. Tae-woong Yoon, School of Electrical Engineering, Korea University

● Undergraduate Research Assistant

3D Exploration Video using 3D SLAM Data 2012.01 ~ 2012.02
- Design 3D video using VRML programming with polygon data from 3D SLAM

Robotics Laboratory (Prof. Nakju Doh) , Korea University

Image Processing Algorithm in Surveillance System 2011.03 ~ 2011.08

・Learn background subtraction algorithm used in elevator

・Propose post-processing algorithm finding floor area with hough transform and door localization

Intelligent Signal Processing Laboratory (Prof. Hanseok Ko) , Korea University

TECHNICAL SKILLS

C/C++, Python, MATLAB, OpenCV, TensorFlow, DSP, VRML, SOLIDWORKS

PUBLICATION

1. Sahba Aghajani Pedram*, **Changyeob Shin***, Peter Walker Ferguson, Ji Ma, Erik P. Dutson, Jacob Rosen, "A Robust Visual Servoing Framework for Autonomous Multilateral Suturing", **In Preparation**
2. **Changyeob Shin**, Peter Walker Ferguson, Sahba Aghajani Pedram, Ji Ma, Erik P. Dutson, Jacob Rosen, "Learning Soft Tissue Dynamics in Image Space for Automated Bimanual Tissue Manipulation with Surgical Robots", International Conference on Robotics and Automation (ICRA 2019), **Accepted**
3. Seo, W., **Shin, C. Y.**, Choi, J., Hong, D., & Han, C. S. (2016, January). "Applications of Supernumerary Robotic Limbs to Construction Works: Case Studies". In ISARC. Proceedings of the International Symposium on Automation and Robotics in Construction (Vol. 33, p. 1). Vilnius Gediminas Technical University, Department of Construction Economics & Property.
4. **Shin, Chang-Yeob**, Jangho Bae, and Daehie Hong. "Ceiling work scenario based hardware design and control algorithm of supernumerary robotic limbs." Control, Automation and Systems (ICCAS), 2015 15th International Conference on. IEEE, 2015.
5. Sung-Min Moon, **Chang-Yeob Shin**, Jaemyung Huh, Kyeong-Won Oh and Daehie Hong, "Window Cleaning System with Water Circulation for Building Façade Maintenance Robot and Its Efficiency Analysis", in *International Journal of Precision Engineering and Manufacturing-Green Technology*, Vol. 2, pp 65-72, Jan 2015.
6. **Chang-Yeob Shin**, Sung-Min Moon, Junho Kwon, Jaemyung Huh and Daehie Hong, "Force Control of Cleaning Tool System for Building Wall Maintenance Robot on Built-in Guide Rail" in International Symposium on Automation and Robotics in Construction and Mining (ISARC) 2014 Conference, Sydney, Australia, July 2014.
7. **Chang-Yeob Shin**, Daehie Hong, Junho Kwon and Sung-Min Moon, "Development of Sensor Control Algorithm for Precise Control of High Building Maintenance Robot", in Korean Society for Precision Engineering 2013 Fall Conference, Busan, Korea, November 2013.
8. Se-Mi Yoon, Sung-Min Moon, **Chang-Yeob Shin** and Daehie Hong, "Cleaning Process Simulation for Building Façade Maintenance Robot with Built-in Guide Rail", in Industrial Engineering and Information Technology (IEIT) 2014 Conference, Tianjin, China, May 2014.

HONORS and AWARDS

● IEEE Robotics and Automation Society (RAS) Travel Grant for ICRA 2019 2019.05

● National Science and Engineering Scholarship ($44,800), KOSAF 2007.03 ~ 2013.08

- Undergraduate 4 years full scholarship supported by Korean Government

● Excellence undergraduate internship paper award from Korea University Innovation Center 2012. 01

- Post-processing Algorithm in Background Subtraction Algorithm for Elevator Surveillance Video

Editorial Duties

Reviewer

● Journal of the Korean Society for Precision Engineering 2018.03 ~

TEACHING EXPERIENCE

Teaching Assistant, Associate (2017 Winter ~), Fellow (2018 Fall ~)

Mathematics of Engineering S16 ~ S19 (10Qs)
Instructor: Prof. Jacob Rosen, Prof. Amiya Chatterjee, UCLA
- Hold discussion session every week, manage assignments and grade exams

Physics Laboratory for Scientists and Engineers: Electricity and Magnetism W16
Instructor: Professor Martin Simon, UCLA
- Lead laboratory class and graded lab reports

Dynamics F14
Instructor: Professor Daehie Hong, Korea Univ.
- Hold discussion session for example problems, manage assignments and exams

Manufacturing processes and machine shop practice S14
Instructor: Professor Woochun Choi, Korea Univ.
- Instruct milling machine and basic bench work process

Major Class Tutor

Signal and Systems F11
Instructor: Professor Hanseok Ko, Korea Univ.
- Hold discussion session

EXTRA-CURRICULAR ACTIVITIES

- President of UCLA KGSA (Korean Graduate Student Association) 2017.07 ~ 2018.07
  - Organize activities for UCLA Korean graduate students
  - Manage outreach with companies from South Korea
- Military service 2009.03 ~ 2011.01
  - Work in the communication equipment support element
- Traveling Club 2011.09 ~ 2014.08
  - Travel to many of domestic and international places