Jungseok Hong

CONTACT INFORMATION	Department of Computer Science and Engineering University of Minnesota 129 Shepherd Laboratories, 100 Union St SE Minneapolis, MN 55155 USA.

E-mail: jungseok@umn.edu
jungseokhong.umn.edu

RESEARCH INTERESTS

Mobile Robotics, Underwater Robotics, Deep Learning, Machine learning, Computer Vision, Robot Localization, Action Recognition, Visual Odometry.

EDUCATION

University of Minnesota, Minneapolis, MN, USA.

Ph.D., Computer Science and Engineering, Expected May 2022
- Advisor: Professor Junaed Sattar
- Area of Study: Underwater Robotics, Object Detection, AUV Localization.

University of Central Florida, Orlando, FL, USA.

M.Sc. Electrical Engineering, May 2017
- Thesis Title: *A Multiagent Q-learning-based Restoration Algorithm for Resilient Distribution System Operation.*
- Advisor: Professor Wei Sun
- Area of Study: Power System Restoration, Microgrid, Power System Protection.
- GPA 4.00

South Dakota State University, Brookings, SD, USA.

B.Sc. Electrical Engineering, *Summa Cum Laude*, May 2015.
- Senior Design Title: *Design of Relay-based Protection Scheme for Wind Farm Generator Installations.*
- Advisor: Professor Wei Sun
- Minor in Mathematics.
- Fundamentals of Engineering Certificate.
- GPA 3.96

Sung Kyun Kwan University, Seoul, Korea.

B.Sc. Electrical Engineering, August 2015.
- Dual Degree with South Dakota State University.

RESEARCH EXPERIENCE

University of Minnesota, Minneapolis, MN, USA.

Interactive Robotics and Vision Lab, Department of Computer Science and Engineering

September 2017 –
- Advisor: Professor Junaed Sattar
- Developing localization algorithms for AUVs using Bayesian filter-based methods.
- Developing underwater debris detection algorithms for AUVs using CNN-based object detection algorithms.

University of Central Florida, Orlando, FL, USA.

Power Systems Lab, Department of Electrical Engineering and Computer Science

August 2015 to August 2017

- Advisor: Professor Wei Sun
- Developed power system restoration strategy using multi-agent system, reinforcement learning, and genetic algorithms to optimize the strategy.
- Developed power system testbed consisting of a real-time digital simulator (OPAL-RT), relay, PMU, and high voltage amplifier.
- Other responsibilities included reviewing and editing manuscripts.

South Dakota State University, Brookings, SD, USA.

Microgrid Lab, Department of Electrical Engineering and Computer Science

May 2014 to August 2015

- Advisor: Professor Wei Sun
- Developed the project Communication-Assisted Protection Strategy using IEC 61850 GOOSE messaging and presented an alternative way to handle the messaging data to devices.
- Developed power system protection testbed using a real-time digital simulator and relay.
- Advised summer undergraduate research for power system testbed development.

Image Processing Lab, Department of Electrical Engineering and Computer Science

August 2013 to April 2014

- Advisor: Professor Dennis Helder
- Developed the methodology for estimating the image quality of Landsat 8 using Matlab.
- Analyzed satellite image data and developed the algorithm for evaluating the quality of each image.

Computer Engineering Lab, Department of Electrical Engineering and Computer Science

August 2013 to April 2014

- Advisor: Professor Wei Wang
- Developed the firmware for vehicle head up display using Arduino and LED.
- Designed the hardware setting to connect a mobile device to LED circuit.

PUBLICATIONS

[J2] Islam, J.;Hong, J.;Sattar, J. "Person Following by Autonomous Robots: A Categorical Overview", under review at the International Journal of Robotics Research (IJRR).

[J1] Wenny, B.;Helder, D.;Hong, J.;Leigh, L.; Thome, K.;Reuter, D. "Pre- and Post-Launch Spatial Quality of the Landsat 8 Thermal Infrared Sensor" Remote Sensing. 2015, 7(2), 1962-1980.

[C1] Fulton, M.;Hong, J.; Islam J.;Sattar, J. "Robotic Detection of Marine Litter Using Deep Visual Detection Models" under review at the IEEE International Conference on Robotics and Automation (ICRA) 2019.

[P3] Hong, J.;Sun, W. "Development of a Cyber-Physical Testbed for Relay Protection Scheme", 2015 PES General Meeting Conference, Denver, CO.

[P2] Hong, J.;Buckmiller, J.;Metzger, B. "Design of Relay-based Protection Scheme for Wind Farm Generator Installations", 2015 Center for Power System Studies, Rapid City, SD.

[P1] Hong, J.;Sun, W. "Communication-Assisted Protection Strategy using IEC 61850 GOOSE messaging", 2014 NAPS, Pullman, WA.

AWARDS

[A6] Power System Protection Scholarship, Schweitzer Engineering Lab. (SEL), $4,000. Awarded in recognition of outstanding academic and personal achievements, 2015.

[A5] Received 2nd place among 15 teams from South Dakota State Engineering Expo, $500. Project title:"Design of Relay-based Protection Scheme for Wind Farm Generator Installations", 2015.

[A4] BENNET Fellowship, South Dakota State University, $3,000. First international student recipient. Awarded to one student annually in recognition of outstanding academic and personal achievements, 2014.

[A3] Dean's Honor List, South Dakota State University, 2013-2015.

[A2] Dean's Honor List, Sung Kyun Kwan Unviersity, 2010-2012.

[A1] Samsung Full Scholarship, Sung Kyun Kwan University, $40,000. Awarded in recognition of outstanding Korean SAT score and high school GPA, 2007-2015.

COURSE PROJECTS

[C5] Action Recognition (Machine Learning Course - ongoing as of Nov. 2018): Developing a deep learning-based action recognition framework to detect abnormal activities by using Tensorflow and Pytorch with UCF101 dataset.

[C4] Acoustic localization for Autonomous Underwater Vehicles (Field Robotics Course - ongoing as of Nov. 2018): Developing the localization method which does not depend on either existing bathymetry data or costly sensors by utilizing acoustic frequency information.

[C3] Visual Odometry Using a Stereo Camera (Computer Vision Course): Implemented the steps of visual odometry including feature extraction, feature matching, triangulation of landmarks, pose estimation using 3D-2D correspondences with KITTI dataset.

[C2] Depth-Based Monte Carlo Localization (Robotics II Course): Developed an application of Monte-Carlo Localization (MCL) methods, utilizing depth information from pressure and sonar sensors to localize AUV with given bathymetric data.

[C1] Underwater Trash Detection Project (Robotics I Course): Developed deep learning models for the detection of marine debris and consider the exploration and summarization algorithms necessary to apply this visual trash recognition to the automated creation of trash cleanup plans.

PROFESSIONAL MEMBERSHIPS

[P3] IEEE Eta Kappa Nu (HKN), the honor society of IEEE 2014–

[P2] Tau Beta Pi (TBP), national engineering honor society 2014–

[P1] Institute of Electrical and Electronics Engineers (IEEE), 2013–

TECHNICAL
ACTIVITIES

[T2] Self Driving Car Club, University of Minnesota, 2017–

[T1] Robotics Club, Sung Kyun Kwan University, 2011-2012.

LEADERSHIP
ACTIVITIES

[L4] Minnesota Korean Graduate Student Association Vice President, University of Minnesota 2018–

[L3] Habitat for Humanity Fundraising Chair, University of Central Florida 2015-2016.

[L2] IEEE HKN Vice President, South Dakota State University 2014-2015.

[L1] Korean Student Association(KSA) President, South Dakota State University 2013-2015.

TEACHING
EXPERIENCE

University of Minnesota, Minneapolis, MN, USA.

Teaching Assistant, Department of Computer Science and Engineering

Fall 2017 –

- Teaching assistant to Professor Rui Kuang, CSCI5521, Introduction to Machine Learning. Spring 2019.
- Teaching assistant to Professor Junaed Sattar, CSCI5551, Robotics I. Fall 2018.
- Teaching assistant to Professor Yousef Saad, CSCI2033, Linear Algebra. Spring 2018.
- Teaching assistant to Lecturer Chris Dovolis, CSCI2021, Computer Architecture. Fall 2017.

University of Central Florida, Orlando, FL, USA.

Teaching Assistant, Department of Electrical Engineering and Computer Science

Spring 2017

- Teaching assistant to Lecturer Azza Fahim, EEL3004, Electrical Network. Spring 2017.
- Teaching assistant to Professor Aman Behal, EEL3004, Electrical Network. Spring 2017.

TECHNICAL
SKILLS –
SOFTWARE

Programming: ROS, C, C++, Python, Assembly, Git.

Software Tools: CPLEX, PSpice, AutoCad, Solidaworks, PowerWorld, SEL Architecture.

MATLAB experience: power systems and control systems design using Simulink. Satellite image processing.

MATLAB toolboxes: power systems, image processing, statistics, control systems.

TECHNICAL
SKILLS –
HARDWARE

Robotic Hardware: Hardware, operations and programming experience with the Aqua amphibious robot platforms.

Hardware, operations and programming experience with the TurtleBot robots.

Hardware, operations experience with the OPAL-RT real-time digital simulator, a testbed development experience with power protection relays.

OUTREACH

[O4] University of Minnesota. CSE Ph.D. student representative, Presenting CSE program and research at the CSE career fair. September 2018.

[O3] University of Minnesota. MnDrive Scholar, Teaching Tech Camp for middle school students. May 2018 to August 2018.

[O2] University of Minnesota. MnDrive Scholar, Presenting Tech Camp at the Minnesota State Fair. August 2018.

[O1] University of Minnesota. Student Representative, Organizing and operating prospective students visiting day. March 2018.