

Seongsik PARK

PERSONAL DATA

Postdoctoral Researcher
Center for Intelligent and Interactive Robotics
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RESEARCH INTERESTS

To recognize human motion via motion sensor and sEMG

- recognition of sEMG pattern and discrete motion w/ or w/o prerequisite training
- hierarchical motion segmentation of continuous movement using sEMG
- application for human-robot interaction e.g., manipulator and prosthesis

To teach and deliver human motor skill to robot

- impedance robot programming by demonstration via sEMG
- human motion analysis by iterative optimal control

EDUCATION

AUG 2019 Ph.D. in MECHANICAL ENGINEERING
MAR 2011 **Pohang University of Science and Technology (POSTECH)**, Pohang, Korea
Advisor: Prof. Wan Kyun CHUNG
GPA: 3.77/4.30

AUG 2010 B.S. in MECHANICAL AND AEROSPACE ENGINEERING
MAR 2007 **Seoul National University (SNU)**, Seoul, Korea
GPA: 3.43/4.30 standing 67/179.

RESEARCH EXPERIENCE

Current SEP 2019 Postdoctoral Researcher in *MARCH Lab*. | Principal Investigator: Dr. Keehoon KIM
Korea Institute of Science and Technology (KIST), Seoul, Korea

AUG 2019 Research Student in *MARCH Lab*. | Principal Investigator: Dr. Keehoon KIM
APR 2016 **Korea Institute of Science and Technology (KIST)**, Seoul, Korea

AUG 2019 Research Assistant in *Robotics Lab*. | Principal Investigator: Prof. Wan Kyun CHUNG
MAR 2011 **Pohang University of Science and Technology (POSTECH)**, Pohang, Korea

AWARDS AND HONORS

- DEC 2019 Best Student Paper Award in *Mechanical Engineering Department, POSTECH*
DEC 2018 RMI Best Paper Award in *Robotics and Media Institute, KIST*
JAN 2018 Best Paper Award in *2018 13th Korea Robotics Society Annual Conference*
Seongsik Park, Woongyong Lee, Wan Kyun Chung, and Keehoon Kim, "Ball trapping: impedance programming by demonstration using sEMG."
MAY 2013 Best Paper Award in *2013 8th Korea Robotics Society Annual Conference*
Seongsik Park, and Wan Kyun Chung, "Simulation study of planar 2-DOF arm model for velocity-dependent stiffness modulation using iLQR algorithm."
2007-2010 National Science and Technology Scholarship of *Korea Student Aid Foundation*

PUBLICATIONS

Journal Articles

3. Seongsik Park, Wan Kyun Chung, and Keehoon Kim, "Training-Free Bayesian Self-Adaptive Classification for sEMG Pattern Recognition Including Motion Transition," *IEEE Transactions on Biomedical Engineering* (accepted).
2. Seongsik Park, Donghyeon Lee, Wan Kyun Chung, and Keehoon Kim, "Hierarchical Motion Segmentation through sEMG for Continuous Lower Limb Motions," *IEEE Robotics and Automation Letters*, vol. 4, no. 4, pp. 4402-4409, 2019.
1. Seongsik Park, Woongyong Lee, Wan Kyun Chung, and Keehoon Kim, "Programming by Demonstration Using the Teleimpedance Control Scheme: Verification by an sEMG-Controlled Ball-Trapping Robot," *IEEE Transactions on Industrial Informatics*, vol. 15, no. 2, pp. 998-1006, 2019.

Refereed Conference Papers

9. Seongsik Park, and Wan Kyun Chung, "Localizing a needle tip using 2D microscope images and detecting vertical approach of a needle based on focus measures for intracellular microneedle insertion," in *Intelligent Robots and Systems (IROS), 2016 IEEE/RSJ International Conference on*, 2016, pp. 2567-2571.
8. Seongsik Park, and Wan Kyun Chung, "Tele-impedance control of virtual system with visual feedback to verify adaptation of unstable dynamics during reach-to-point tasks," in *Biomedical Robotics and Biomechatronics (BioRob), 2016 6th IEEE RAS/EMBS International Conference on*, 2016, pp. 1283-1289.
7. Seongsik Park, Il Hong Suh, and Wan Kyun Chung, "Dynamic motion phase segmentation using sEMG during countermovement jump based on hidden semi-Markov model," in *Robotics and Automation (ICRA), 2015 IEEE International Conference on*, 2015, pp. 1461-1467.
6. Seongsik Park, and Wan Kyun Chung, "Dynamic motion phase segmentation using electromyogram," in *Ubiquitous Robots and Ambient Intelligence (URAI), 2015 12th International Conference on*, 2015, pp. 202-203.
5. Seongsik Park, and Wan Kyun Chung, "Decoding surface electromyogram into dynamic state to extract dynamic motor control strategy of human," in *Intelligent Robots and Systems (IROS), 2014 IEEE/RSJ International Conference on*, 2014, pp. 1427-1433.
4. Seongsik Park, and Wan Kyun Chung, "Autonomous segmentation of motion primitive including muscular activation using variational Bayesian mixture of Gaussian," in *Ubiquitous Robots and Ambient Intelligence (URAI), 2013 10th International Conference on*, 2013, pp. 5-9.
3. Minjae Kim, Seongsik Park, and Wan Kyun Chung, "Flexible polymer-based micro needle array sEMG sensor," in *Ubiquitous Robots and Ambient Intelligence (URAI), 2013 10th International Conference on*, 2013, pp. 1-4.

2. Min Jun Kim, **Seongsik Park**, and Wan Kyun Chung, "Nonlinear robust internal loop compensator for robust control of robotic manipulators," in *Intelligent Robots and Systems (IROS), 2012 IEEE/RSJ International Conference on*, 2012, pp. 2742-2748.
1. **Seongsik Park**, and Wan Kyun Chung, "Combined method of weighted least norm and gradient projection for avoiding joint limit," in *Ubiquitous Robots and Ambient Intelligence (URAI), 2011 8th International Conference on*, 2011, pp. 798-799.

LANGUAGES, SKILLS AND ABILITIES

Languages	Korean (mothertongue) English (intermediate)
Computer Skills	MATLAB, C/C++, \LaTeX , Python Visual Studio, OpenSim, Real-time OS (RTX, Xenomai) SolidWorks, Adobe Illustrator & Premiere
Hardware & Equipments	Manipulator (Schunk 7-DOF LWA3, Neuromeka Indy RP) sEMG sensors (Delsys, Noraxon, Thalmic MYO) Motion capture (MotionAnalysis) DAQ devices (National Instruments)

INTERESTS AND ACTIVITIES

Badminton, Swimming, Photograph, Pungmul (Korean traditional music), Bicycle