

# Seongsik PARK

## PERSONAL DATA

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Postdoctoral Researcher  
Interaction and Robotics Research Center  
Korea Institute of Science and Technology (KIST)  
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## RESEARCH INTERESTS

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### **Motion recognition using sEMG**

recognition of sEMG pattern and motion, motion segmentation of continuous motion, machine learning, probabilistic method, Bayesian method

### **Impedance programming by demonstration using sEMG**

robot control using biosignal, variable stiffness control, human skill teach & transfer, programming by demonstration, human-robot interaction

## EDUCATION

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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

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*Current* Research Student in [MARCH Lab](#). | Principal Investigator: Dr. Keehoon KIM  
SEP 2019 **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

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- DEC 2018 RMI Best Paper Award in *KIST Robotics and Media Institute*
- 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

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### Journal Articles

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.

### Journal Articles Under Review

1. **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*.

### 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 Biomechanics (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

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

## INTERESTS AND ACTIVITIES

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