Seongsik Park

Assistant Professor
Division of Advanced Engineering
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Education

Aug 2019 – Mar 2011 **Ph.D.** in Mechanical Engineering
Pohang University of Science and Technology (POSTECH), Pohang, Korea
Dissertation: Dynamic Motion Recognition and Robot Control using sEMG
Advisor: Prof. Wan Kyun Chung

Aug 2010 – Mar 2007 **B.S.** in Mechanical and Aerospace Engineering
Seoul National University (SNU), Seoul, Korea

Experience

Present – Sep 2023 **Assistant Professor** in Division of Advanced Engineering
Korea National Open University, Seoul, Korea

Aug 2023 – Sep 2020 **Assistant Professor** in School of AI Convergence
Dongguk University, Seoul, Korea

Aug 2020 – Mar 2020 **Postdoctoral Researcher** in Department of Mechanical Engineering
Pohang University of Science and Technology (POSTECH), Pohang, Korea

Feb 2020 – Sep 2019 **Postdoctoral Researcher** in Center for Intelligent & Interactive Robotics
Korea Institute of Science and Technology (KIST), Seoul, Korea

Aug 2019 – Apr 2016 **Research Student** in Center for Intelligent & Interactive Robotics
Korea Institute of Science and Technology (KIST), Seoul, Korea

Aug 2019 – Mar 2011 **Research Assistant** in Mechanical Engineering Department
Pohang University of Science and Technology (POSTECH), Pohang, Korea

Publications

Under Review and In Preparation

3. **Seongsik Park**, "sEMG Onset Measure Based on Bayesian Filter to Reduce Fall Detection Time."
2. Jiyong Moon, Junseok Lee, Yunju Lee, and **Seongsik Park**, "M2Former: Multi-Scale Patch Selection for Fine-Grained Visual Recognition," *Neurocomputing*.
1. Jiyong Moon, and **Seongsik Park**, "SimFLE: Simple Facial Landmark Encoding for Self-Supervised Facial Expression Recognition in the Wild," *IEEE Transactions on Affective Computing*.

Journal Articles

7. Jeonghoon Kim, Jinming Cao, Jihie Kim, Roger Zimmermann, and **Seongsik Park**, "Class Incremental Learning via Feature Space Calibration," *Computational Visual Media* (accepted).
6. Junseok Lee, Jinming Cao, Yifang Yin, Jihie Kim, Roger Zimmermann, and **Seongsik Park**, "Bi-Directional Attention for Generalized Zero-Shot Learning," *Computational Visual Media* (accepted).
5. Jiyong Moon, and **Seongsik Park**, "Robust Visual Detection of Brake-Lights in Front for Commercialized Dashboard Camera," *PLOS ONE*, vol. 18, no. 8, 2023.
4. Chaerin Hong, **Seongsik Park**, and Keehoon Kim, "Temporal History in Transient State Distinguishing Inseparable sEMG Patterns for Gesture Recognition," *IEEE Transactions on Biomedical Engineering*, vol. 70, no. 9, pp. 2655-2666, 2023.
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*, vol. 67, no. 7, pp. 1775-1786, 2019.
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, 2018.

Refereed Conference Proceedings

10. Junseo Lee, Junwoo Park, and **Seongsik Park**, "Bayesian Filter for sEMG to Reduce Fall Detection Time: Preliminary Study," in *The 22nd International Symposium on Advanced Intelligent Systems* (*ISIS*), 2021.
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.

Domestic Journal and Conference

10. Jiyong Moon, and **Seongsik Park**, "Combining Contrastive Learning and Destruction/Construction Learning for Training Facial Expression Recognition Models," in *2023 Korea Computer Congress* (*KCC*).
9. Junseok Lee, and **Seongsik Park**, "Effective Visual-Semantic Interaction in Zero-Shot Learning with Attribute-Assisted Transformers," in *2023 Korea Computer Congress* (*KCC*).
8. Yunju Lee, and **Seongsik Park**, "Increase Performance by Data Augmentation in Pose Estimation Task with Occluded Situation," in *2023 Korea Computer Congress* (*KCC*).
7. Jeonghoon Kim, Ryu Jeh-Kwang, and **Seongsik Park**, "Robust Weight Conversion Learning for Classification of Occlusion Images," *Journal of Korea Robotics Society*, vol. 18, no. 1, pp. 122-126, 2023.
6. Junseok Lee, and **Seongsik Park**, "Bi-Direction Attention for Zero-Shot Learning," in *2023 18th Korea Robotics Society Annual Conference*.
5. Yunju Lee, Jiyong Moon, and **Seongsik Park**, "Study of Relation Between Batch Size and Performance of Generative Model for Occluded Pose Estimation," in *2023 18th Korea Robotics Society Annual Conference*.
4. Junseok Lee, and **Seongsik Park**, "Classic Augmentation and DCGAN Combination for Generating Various Fake Defect Images," in *2022 Joint Conference on Communications and Information*.
3. **Seongsik Park**, Hyun-Joo Lee, Wan Kyun Chung, and Keehoon Kim, "Training-Free sEMG Pattern Recognition Algorithm: A Case Study of A Patient with Partial-Hand Amputation," *Journal of Korea Robotics Society*, vol. 14, no. 3, pp. 211-220, 2019.
2. **Seongsik Park**, Woongyong Lee, Wan Kyun Chung, and Keehoon Kim, "Ball trapping: impedance programming by demonstration using sEMG," in *2018 13th Korea Robotics Society Annual Conference*.
1. **Seongsik Park**, and Wan Kyun Chung, "Simulation study of planar 2-DOF arm model for velocity-dependent stiffness modulation using iLQR algorithm," in *2013 8th Korea Robotics Society Annual Conference*.

Awards and Honors

Feb 2023	**2022 Best Teaching Professor (Top 10)** in *Dongguk University*
Aug 2021	**Top 15 Outstanding Remote Lectures** in *Center for Teaching and Learning, Dongguk University*
Dec 2019	**Outstanding Student Paper Award** in *Mechanical Engineering Department, POSTECH*
Dec 2018	**Outstanding Paper Award (Exclusive)** in *Robotics and Media Institute, KIST*
Jan 2018	**Outstanding Paper Award** in *2018 13th Korea Robotics Society Annual Conference*
May 2013	**Outstanding Paper Award** in *2013 8th Korea Robotics Society Annual Conference*
2007-2010	**National Science and Technology Scholarship** of *Korea Student Aid Foundation*

Lectures

Spring 2023	[SCS4049] Machine Learning and Data Science (2 classes)† [AIB2001] Fundamental Mathematics for Artificial Intelligence† [AIX7021] Computer Vision [DSC4007] Data Science Capstone Design †Flipped Learning
Fall 2022	[SCS4049] Machine Learning and Data Science† [AIB2001] Fundamental Mathematics for Artificial Intelligence† [AIX7063] Robotics [DSC4007] Data Science Capstone Design †Flipped Learning
Spring 2022	[SCS4049] Machine Learning and Data Science† [EGC4040] Introduction to Artificial Intelligence Programming in Practice [AIX7021] Computer Vision [AIX7030] Signal Processing and Machine Learning [DSC4007] Data Science Capstone Design †Flipped Learning
Fall 2021	[SCS4049] Machine Learning and Data Science† [DSC4007] Data Science Capstone Design †Flipped Learning
Spring 2021	[SCS4049] Machine Learning and Data Science† [AIX7026] Advanced Machine Learning [DSC4007] Data Science Capstone Design [DES4024] Enterprise and Society Tailored Capstone Design Project †Flipped Learning
Fall 2020	[SCS4049] Machine Learning and Data Science [AIX7021] Computer Vision [SCS4031] Convergence Capstone Design

Patents

3. SENSOR FUSION POSITION MEASUREMENT SYSTEM; **Seongsik Park**; Application: 10-2022-0176808 (Korea); Tech. Transfer 10.0M won.
2. VEHICLE AND METHOD FOR DETERMINING STOP MOTION OF CAR AHEAD; Jiyong Moon, **Seongsik Park**, Junseok Lee; Application: 10-2022-0011468 (Korea).
1. TERMINAL AND METHOD OF DETERMINING ACTIVATION POINT OF MUSCLE USING THE TERMINAL; **Seongsik Park**, Junseok Lee; Application: 10-2022-0011467 (Korea); Tech. Transfer 4.0M won.

Projects

In Progress

Dec 2023 – Aug 2022 — Multi-Modal Sports Motion Recognition using Deep Learning-Based Sensor Fusion of Vision and Motion Sensor (72.0M won / 2 years)
Dongguk University & Spotu, National Research Foundation of Korea

Completed

May 2022 – Jun 2021 — Development of Robust Detection of Motion Intention Prior to Motion using sEMG (56.0M won / 1 year)
Dongguk University, National Research Foundation of Korea

Professional Service

Served/ing as an organizing committee, including:
- Korea Robotics Society Annual Conference

Served/ing as a reviewer for international journals, including:
- IEEE Transactions on Robotics (T-RO)
- IEEE Transactions on Haptics
- IEEE Robotics and Automation Letters (RA-L)
- IEEE Journal of Biomedical and Health Informatics (JBHI)
- IEEE Sensors
- Measurement Science and Technology
- Intelligent Service Robotics

Served/ing as a reviewer for international conference, including:
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- AAAI Conference on Artificial Intelligence (AAAI)