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Contact Information

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Research Interests

Machine Learning: Long-Term Memory, Unsupervised Learning (Clustering), Incremental Learning, Continual Learning, Transfer Learning, Computer Vision, Deep Reinforcement Learning, Memory Networks

Robotics: Autonomous Intelligent Agent, Humanoid and its Gait Mechanism, Task Intelligence, Robot Hand Grasping

Education

KAIST, Daejeon, Republic of Korea 03/2016 – 08/2019
Ph.D. in School of Electrical Engineering
Thesis: “Memory-based Continual Learning for Autonomous Intelligent Agent”
Advisor: Prof. Jong-Hwan Kim

KAIST, Daejeon, Republic of Korea 03/2014 – 02/2016
M.S. in School of Electrical Engineering
Thesis: “Deep ART Memory Based Cognitive Architecture for Robots”
Advisor: Prof. Jong-Hwan Kim

Sungkyunkwan University, Suwon, Republic of Korea 03/2008 – 02/2014
B.S. in Electronic and Electrical Engineering
Thesis: “The Enhancement of Light Extraction Efficiency of Blue-LED by Using Double Layer Photonic Crystals”
Advisor: Prof. Bong-Shik Song

POSITIONS

ETRI, Daejeon, Republic of Korea 03/2020 – Present
Researcher, Artificial Information Research Laboratory

KAIST, Daejeon, Republic of Korea 09/2019 – 02/2020
Postdoctoral Fellow, Information & Electronics Research Institute

TEACHING EXPERIENCE

Teaching assistant at School of Electrical Engineering, KAIST 2014 – 2016

- EE212: "Electronics Design and Practice" (3-credits)
- EE381: "Control System Engineering" (3-credits)
- EE490: "B.S. Thesis Research" (3-credits)
- EE495: "Individual Study" (3-credits)

RESEARCH PROJECTS

[1] Development of Robot Hand Manipulation Intelligence 2018 – Present
to Learn Methods and Procedures for Handling Various Objects
with Tactile Robot Hands
Supervision: National IT Industry Promotion Agency (NIPA)
Role: Sub-team leader (2018-2019) & Development of knowledge transfer learning technology for Deep RL, applicable to other task environments and objects of new domain

[2] Research on Adaptive Machine Learning Technology 2016 – Present
Development for Intelligent Autonomous Digital Companion
Supervision: Institute of Information & Communications Technology Planning & Evaluation (IITP)
Role: Sub-team leader (2016-2019) & Memory-based developmental learning and continual learning for deep neural networks

[3] Long-Term Memory Module based intelligent Operating 2015 – Present
Architecture Design Technology for Implementing Artificial Intelligence
Supervision: Samsung Device Solutions (DS)
Role: Project leader (2016-2018) & Design of long-term memory module for intelligent Operating Architecture (iOA)

[4] Development of Robot Task Intelligence Technology 2014 – 2018
that can Perform Task more than 80% in Inexperience Situation through Autonomous Knowledge Acquisition and Knowledge Application
Supervision: Korea Evaluation Institute of Industrial Technology (KEIT)
Role: Project leader (2017-2018) & Design of long-term memory which can do adaptive knowledge acquisition for task intelligence of the robot & General Manager of real robot experiments

[5] Development of Container Carrier Shape Measurement System 2014

Supervision: Hyundai Heavy Industry (HHI)
Role: Researcher (2014) & Design of the motor control board and product test

[6] Robust Unified Navigation Technology of Humanoid Robot Using Gaze Control, Posture Learning and Footstep Planning 2014
Supervision: National Research Foundation of Korea (NRF)
Role: Sub-team leader (2014) & Development of the kid-sized humanoid robot (HanSaRam) & Design of the robust posture controller

JOURNAL PAPERS

[1] **G.-M. Park** and J.-H. Kim
"Adaptive Developmental Resonance Network"
IEEE Transactions on Neural Networks and Learning Systems (TNNLS), Jul. 2019, under review. [SCI, IF 11.683]

[2] **G.-M. Park**, S.-M. Yoo, and J.-H. Kim
"Convolutional Neural Network with Developmental Memory for Continual Learning"
IEEE Transactions on Neural Networks and Learning Systems (TNNLS), May 2019, under review. [SCI, IF 11.683]

[3] **G.-M. Park**, J.-W. Choi, and J.-H. Kim
"Developmental Resonance Network"
IEEE Transactions on Neural Networks and Learning Systems (TNNLS), vol. 30, no. 40, pp. 1278-1284, Apr. 2019. [SCI, IF 11.683]

[4] **G.-M. Park**, Y.-H. Yoo, D.-H. Kim, and J.-H. Kim
"Deep ART Neural Model for Biologically Inspired Episodic Memory and Its Application to Task Performance of Robots,"
IEEE Transactions on Cybernetics (TCYB), vol. 48, no. 6, pp. 1786-1799, Jun. 2018. [SCI, IF 10.387]

[5] D.-H. Kim, **G.-M. Park**, Y.-H. Yoo, I.-B. Jeong, and J.-H. Kim
"Realization of Task Intelligence for Service Robots in an Unstructured Environment"
Annual Reviews in Control (IFAC), vol. 44, no. 1, pp. 9-18, Sep. 2017. [SCI-E, IF 4.759]

[6] I.-B. Jeong, W.-R. Ko, **G.-M. Park**, D.-H. Kim, Y.-H. Yoo, and J.-H. Kim
"Task Intelligence of Robots: Neural Model-based Mechanism of Thought and Online Motion Planning"
IEEE Trans. Emerg. Topics Comput. Intell. (TETCI), vol. 1, no. 1, pp. 41-

50, Feb. 2017.

CONFERENCE PAPERS

[1] Joonhyuk Kim, **G.-M. Park**, and J.-H. Kim
"A Two-phase Multi-channel Classification Resonance Network"
International Conference on Robot Intelligence Technology and Applications (RiTA), Daejeon, Korea, Nov. 2019.

[2] Dick Sigmund, **G.-M. Park**, and J.-H. Kim
"Context Preference-based Deep Adaptive Resonance Theory: Integrating User Preference into Episodic Memory Encoding and Retrieval"
IEEE International Joint Conference on Neural Networks (IJCNN), Alaska, USA, May. 2017.

[3] Y.-H. Yoo, D.-H. Kim, **G.-M. Park**, I.-B. Jeong, S.-H. Baek, S.-J. Ryu, and J.-H. Kim
"Memory-based Realization of Task Intelligence for Robots in Human Environment"
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop, Daejeon, Korea, Oct. 2016.

[4] **G.-M. Park**, Sanghyun Cho, and J.-H. Kim
"Biologically-Inspired Episodic Memory Model Considering the Context Information"
IEEE Conference on System, Man, and Cybernetics (SMC), Hungary, Budapest, Oct. 2016.

[5] **G.-M. Park** and J.-H. Kim
"Deep Adaptive Resonance Theory for Learning Biologically Inspired Episodic Memory"
IEEE International Joint Conference on Neural Networks (IJCNN), Vancouver, Canada, Jul. 2016.

[6] **G.-M. Park**, Y.-H. Yoo, and J.-H. Kim
"REM-ART: Reward-based Electromagnetic Adaptive Resonance Theory"
International Conference on Artificial Intelligence (ICAI), Las Vegas, U.S.A., Jul. 2015.

[7] **G.-M. Park**, S.-H. Baek, and J.-H. Kim
"Falling Prevention System from External Disturbances for Humanoid Robots"
International Conference on Robot Intelligence Technology and Applications (RiTA), Beijing, China, Nov. 2014.

ACADEMIC SERVICES

Journal Reviewer 2016 – Present

- IEEE Trans. on Industrial Electronics (TIE)
- IEEE Trans. on Cybernetics (TCYB)

HONORS & AWARDS

Excellence Award, KAIST 2018

2018 Research Performance Evaluation System for Doctoral Student

PATENTS

Korean Patent Registration (10-1529817) 06/2015

A light emitting diode containing a double-layered photonic crystal structure

SKILLS

Languages

Korean (native)

English

Programming Skills

C, C++, Python (PyTorch, TensorFlow), MATLAB

ROS, Webots, OrCAD, (PCB Solutions), Solidworks, Solid Edge (CAD)

EXTRA ACTIVITIES

[Workshop] Developing Robots for Social Acceptance (DRSA) 11/2019

Role: Research presentations & Discussion of the research collaboration between KAIST and Aalborg Univ. in Denmark

[Reviewer] KAIST IP-CEO Program 07/2019

Role: Advisor & Reviewer to the presentations of explainable AI and cooperating robots

[Presenter] Pangyo Future Forum 02/2019

"4^{th} Industrial Revolution and AI Korea"

Role: Presenter in the poster session (topic: Convolutional Neural Network with Developmental Memory)

[Consultant] The Busan National Science Museum 04/2018

Role: Advisory committee & Comments to the inquiries about the installation of the intelligent receptionist robots in the BNSM robby

[Media] EBS Docuprime 09/2017

"Educational Huge Revolution in the era of 4^{th} Industrial Revolution"

Role: Interview as the KAIST robotics engineer & Demonstration of robot experiment

Site: http://home.ebs.co.kr/docuprime/newReleaseView/345?c.page=1

Student Representative 2017
Robot Intelligence Technology Laboratory in KAIST