

SeungHyeok Back

PH.D CANDIDATE · ROBOTICIST

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Education

GIST(Gwangju Institute of Science and Technology)

Gwang-ju, Republic of Korea

B.S. IN MECHANICAL ENGINEERING

Mar. 2014 - Feb. 2018

Connective Minor in History-Sociology, Korean Government Support Program

GIST(Gwangju Institute of Science and Technology)

Gwang-ju, Republic of Korea

PH.D COURSE IN SCHOOL OF INTEGRATED TECHNOLOGY (ROBOTICS PROGRAM)

Mar. 2018 - PRESENT

Korean Government Support Program

Domain of Research

Robot Vision Unseen Object segmentation, Amodal Percetion for Occlusion Reasoning, RGB-D Fusion

Robotic System Bin-picking, Grasping, and Manipulation via Sim2Real Transfer and Continual Learning

Deep Learning Biomedical Signal Processing (EEG, image), Automatic Detection and Design of CAD Models

Skills

Programming Python (Pytorch), C/C++

Robot Robot System Integration with ROS (Vision-based Manipulation), Sim2Real Transfer (CoppeliaSim, Blender)

Languages Korean, English

Awards & Honors

2022	Bronze Prize, 28th Samsung Humantech Paper , Top 5% (117/2105)	\$5,000
2021	Outstanding Paper Award , 2021 ICROS-KROC Honam Joint Conference	
2021	Outstanding Paper Award , The 16th Korea Robotics Society Annual Conference	
2021	Outstanding Paper Award , The 36th ICROS Annual Conference, Undergrad. Sec. (co-author)	
2020	4th Place, DREAM AI Healthcare Hackathon , GIST-NVIDIA	\$2,500
2020	National R&D Real Challenge Program , Korea Institute of Human Resources Development (KIRD)	\$3,000
2017	President's Award , GIST Innovative Convergence Technology Contest (Track 1)	
2017	Dean's Award , GIST Innovative Convergence Technology Contest (Track 2)	

Experience (Research & Development)

Shared autonomy based on deep reinforcement learning for responding intelligently to unstructured environments such as robotic assembly tasks

Ministry of Trade, Industry and Energy (S. Korea)

SOFTWARE DEVELOPMENT LEADER

Mar. 2020 - PRESENT

Development of artificial intelligence-based ejector-pin location prediction

Samsung Electronics Co., Ltd.

SOFTWARE DEVELOPMENT LEADER

Mar. 2021 - Dec. 2021

Development of AI technology for robotic assembly planning by understanding assembly instruction via Sim2Real Transfer

Ministry of Science and ICT (S. Korea)

PROJECT LEADER

Apr. 2019 - Mar. 2020

Sim-to-real transfer of deep reinforcement learning for visuomotor robot control

GIST Institute for Artificial Intelligence

PROJECT LEADER

Jan. 2019 - Dec. 2019

Artificial intelligence-based object detection of 2D drawing in mold

SOFTWARE DEVELOPMENT LEADER

Samsung Electronics Co., Ltd.

Mar. 2019 - Dec. 2019

Deep learning based sound event detection in the game environments for the haptic feedback generation

MEMBER

Dongwoon Anatech Co., Ltd.

Mar. 2019 - Aug. 2019

Development of an AI algorithm for sleep analysis and diagnosis of sleep apnea syndromes.

CORE MEMBER

GIST

Mar. 2018 - Dec. 2019

Development of assistive technology in elderly care

MEMBER

GIST

Jan. 2018 - Aug. 2019

Selected Publications (SCI & Top Conference)

Unseen object amodal instance segmentation via hierarchical occlusion modeling

ICRA

2022 IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), ACCEPTANCE RATE 43.1%, 1428/3313

To be published, 2022

Seunghyeok Back, Joosoon Lee, Taewon Kim, Sangjun Noh, Raeyoung Kang, Seongho Bak, Kyoobin Lee

* Bronze Prize, 28th Samsung Humantech Paper Award (Top 5% paper)

* Outstanding Paper Award, 2021 ICROS-KROC Honam Joint Conference

Intra- and inter-epoch temporal context network (IITNet) using sub-epoch features for automatic sleep scoring on raw single-channel EEG

SCIE

BIOMEDICAL SIGNAL PROCESSING AND CONTROL, IF=3.880 (2020), CITED MORE THAN 30 TIMES

Aug. 2020

Hogoon Seo*, Seunghyeok Back*, Seongju Lee*, Deokhwan Park, Tae Kim, Kyoobin Lee

Robust Skin Disease Classification by Distilling Deep Neural Network Ensemble for the Mobile Diagnosis of Herpes Zoster

SCIE

IEEE ACCESS, SCIE, IF=3.367 (2020)

Jan. 2021

Seunghyeok Back*, Seongju Lee*, Sungho Shin, Yeonguk Yu, Taekyeong Yuk, Saepomi Jong, Seungjun Ryu, Kyoobin Lee

Pilot study of a single-channel EEG seizure detection algorithm using machine learning

SCIE

CHILDS NERVOUS SYSTEM

May. 2021

Seungjun Ryu, Seunghyeok Back, Seongju Lee, Hyeon Seo, Chanki Park, Kyoobin Lee, Dong-Seok Kim

Segmenting unseen industrial components in a heavy clutter using rgb-d fusion and synthetic data

ICIP

2020 IEEE INTERNATIONAL CONFERENCE ON IMAGE PROCESSING (ICIP), ACCEPTANCE RATE 41.7%, 705/1689

Sep. 2020

Seunghyeok Back, Jongwon Kim, Raeyoung Kang, Seungjun Choi, Kyoobin Lee

Publications

Fusing RGB and depth with Self-attention for Unseen Object Segmentation

International Conference

2021 21ST INTERNATIONAL CONFERENCE ON CONTROL, AUTOMATION AND SYSTEMS (ICCAS)

Dec. 2021

Joosoon Lee*, Seunghyeok Back*, Taewon Kim, Sungho Shin, Sangjun Noh, Raeyoung Kang, Jongwon Kim, Kyoobin Lee

Automatic Detection of Injection and Press Mold Parts on 2D Drawing Using Deep Neural Network

International Conference

2021 21ST INTERNATIONAL CONFERENCE ON CONTROL, AUTOMATION AND SYSTEMS (ICCAS)

Dec. 2021

Junseok Lee, Jongwon Kim, Jumi Park, Seunghyeok Back, Seongho Bak, Kyoobin Lee

AI for furniture assembly - robotic assembly planning from assembly instruction

Korean Journal

ROBOT AND HUMAN (KOREA ROBOTICS SOCIETY)

Jan. 2021

Seunghyeok Back, Sungho Shin, Raeyoung Kang, Seongju Lee, Joosoon Lee, Taekyeong Yuk, Changhyeon Jeon, Jongwon Kim, Yeonguk Yu, Sungho Bak, Junho Yun, Junseok Lee, Kyoobin Lee

Automatic Detection and Identification of Fasteners with Simple Visual Calibration using Synthetic Data

2020 25TH IEEE INTERNATIONAL CONFERENCE ON EMERGING TECHNOLOGIES AND FACTORY AUTOMATION (ETFA)

Junseok Lee, Jongwon Kim, Jumi Park, **Seunghyeok Back**, Seongho Bak, Kyoobin Lee

International Conference

Oct. 2020

Research trend of robotic assembly planning from assembly instruction

THE JOURNAL OF THE KOREAN INSTITUTE OF COMMUNICATION SCIENCES

Seunghyeok Back, Kyoobin Lee

Korean Journal

Dec. 2019

Patent

Components fabrication scheduling apparatus

KR 2021-0072886

Kyoobin Lee, **Seunghyeok Back**, Sungho Shin, Joosoon Lee, Seongju Lee, Raeyoung Kang, Taekyeong Yuk, Seongho Bak

Application

2021

Apparatus and method identifying the size of the target object

KR 2020-0119669

Kyoobin Lee, **Seunghyeok Back**, Sungho Shin, Sangjun Noh, Raeyoung Kang,

Application

2020

Method for optimizing sleep

KR 10-2133314 (TRANSFERRED TO REDWIT)

Hogeon Seo, Kyoobin Lee, **Seunghyeok Back**, Munsang Kim, Tae Kim

Registration

2020

Work Experiences

Teaching Assistant

DEEP LEARNING (RT5101-01, SPRING)

GIST

Mar. 2020 - June. 2020

Teaching Assistant

DEEP LEARNING (RT5101-01, SPRING)

GIST

Mar. 2019 - June. 2019

Teaching Assistant

HANDS ON DEEP LEARNING (ONLINE LECTURE)

STAR-MOOC

2019

Intern

ARTIFICIAL INTELLIGENCE LABORATORY (PROF. KYOOBIN LEE)

GIST

Nov. 2017 - Feb. 2018

Intern

HEALTHCARE ROBOTICS LABORATORY (PROF. MUNSANG KIM)

GIST

July. 2017 - Aug. 2017

Intern

DISTRIBUTED CONTROL AND AUTONOMOUS SYSTEMS LABORATORY (PROF. HYOSUNG AHN)

GIST

July. 2016 - Aug. 2016

First Editor

OFFICIAL PRESS IN GIST

GIST News

Feb. 2016 - Aug. 2016

First Editor

INDEPENDENT PRESS IN GIST

GisCatch

Feb. 2015 - Jan. 2016