Dongho Park

Ph.D. Candidate in Robotics

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Education

2021–Present | **Georgia Institute of Technology** — *Atlanta, USA*
Ph.D. in Robotics

Dissertation: A versatile, tuning-free hip exoskeleton for improving real-world mobility in stroke survivors
Committee: Drs. **Aaron Young** (Chair), Gregory Sawicki, W. Hong Yeo, Trisha Kesar, Seungmoon Song

2021 | **Yonsei University** — *Seoul, Republic of Korea*
M.S. in Medicine

2018 | **Kwangwoon University** — *Seoul, Republic of Korea*
B.S. in Robotics

Research Experience

2021–Present | **Georgia Institute of Technology** — *Atlanta, USA*
Graduate Research Assistant

Advisor: Dr. Aaron Young
Lab: Exoskeleton & Prosthetic Intelligent Controls (EPIC) Lab

2016–2021 | **Severance Hospital** — *Seoul, Republic of Korea*
Research Assistant

Advisor: Dr. Dong-wook Rha (M.D.)
Lab: Biomechanics & Robotic Rehabilitation Lab

2011–2014 | **Kwangwoon University** — *Seoul, Republic of Korea*
Undergraduate Research Assistant

Advisor: Dr. Jin-Oh Kim
Lab: ROBIT (Humanoid Robotics Lab)

Teaching Experience

Spr 2026 | **Georgia Institute of Technology** — *Atlanta, USA*
Graduate Teaching Assistant

Course: ME 6409 - Biomechanics of Wearable Robotic Devices
(Instructors: Dr. Aaron Young & Dr. Greg Sawicki)

Spr 2019, 2020 | **Yonsei University College of Medicine** — *Seoul, Republic of Korea*
Teaching Assistant

Course: MED 9079 - Motion Analysis and Human Gait (Instructor: Dr. Dong-wook Rha)

Honors & Awards

2025 | The Woodruff School Undergraduate Mentoring Fellowship ($3,500)

2023 | Nakatani Research and International Experience for Students (RIES) Mentor Fellowship ($3,300)

2020 | 1^{st} place at Cybathlon (Powered Exoskeleton Race)

2013 | 1^{st} place at International Robot Contest (Humanoid Robot)

2012 | Semi-finalist at Robocup (Humanoid League)

Publications

* denotes equal contribution

Manuscripts in Review & Preparation

J17. **D. Park**, H. Song, T. A. Harvey, K. R. Herrin, T. Kesar, G. S. Sawicki, A. J. Young, "A versatile, tuning-free hip exoskeleton improves real-world mobility in a clinical trial with stroke survivors" *Targeting Nature Medicine (Planned Submission: Feb 2026)*.

J16. **D. Park**, Y. Mhaskar, K. Ghonasgi, S. Park, JY. Choi, T. Kesar, G. S. Sawicki, T. A. Harvey, K. R. Herrin, A. J. Young, "A comprehensive dataset of lower-limb biomechanics and wearable sensor measurements in stroke survivors during daily living activities and clinical assessments" *Targeting NEJM AI (Planned Submission: Mar 2026)*.

J15. **D. Park**[*], C. Song[*], D. Liverman, T. A. Harvey, I. Kang, A. J. Young, "Subject-Independent Biological Hip Moment Estimation in Stroke Survivors During Diverse Mobility Tasks Using Deep Learning" *In Preparation (Planned Submission: May 2026)*.

J14. Y. Mhaskar, **D. Park**, A. Boskovic, A. J. Young, "Ergonomic Robotic Hip Exoskeleton Design with Integrated Second-Skin On-Body Sensing" *IEEE Robotics and Automation Letters*, *Under Review*.

Published Journal Articles

J13. I. Kang, DD. Molinaro, **D. Park**, D. Lee, P. Kunapuli, K. R. Herrin, A. J. Young, "Online Adaptation Framework Enables Personalization of Exoskeleton Assistance During Locomotion in Patients Affected by Stroke" *IEEE Transactions on Robotics*, 2025.

J12. **D. Park**, J. An, D. Lee, I. Kang, A. J. Young, "Human-in-the-loop optimization of hip exoskeleton assistance during stair climbing" *IEEE Transactions on Biomedical Engineering*, 2025. **[Featured Article, July 2025]**

J11. JY. Choi, SK. Kim, J. Hong, H. Park, S. Yang, **D. Park**, MK. Song, "Overground gait training with a wearable robot in children with cerebral palsy: a randomized clinical trial" *JAMA Network Open*, 2024.

J10. H. Choi, **D. Park**, D. Rha, HS. Nam, YJ. Jo, DY. Kim, "Kinematic analysis of movement patterns during a reach-and-grasp task in stroke patients" *Frontiers in Neurology*, 2023.

J9. W. Lee, B. Yoo, **D. Park**, J. Hong, D. Shim, J. Choi, D. Rha, "Analysis of foot kinematics during toe walking in able-bodied individuals using the Oxford Foot Model" *Computer Methods in Biomechanics and Biomedical Engineering*, 2022.

J8. TY. Choi, **D. Park**, D. Shim, J. Choi, J. Hong, Y. Ahn, ES. Park, D. Rha, "Gait adaptation is different between the affected and unaffected legs in children with spastic hemiplegic cerebral palsy while walking on a changing slope" *Children*, 2022.

J7. D. Shim, **D. Park**, B. Yoo, J. Choi, J. Hong, TY. Choi, ES. Park, D. Rha, "Evaluation of sitting and standing postural balance in cerebral palsy by center-of-pressure measurement using force plates: Comparison with clinical measurements" *Gait & Posture*, 2022.

J6. D. Shim, JY. Choi, SH. Yi, ES. Park, S. Kim, B. Yoo, **D. Park**, HR. Park, D. Rha, "Spatiotemporal parameters from instrumented motion analysis represent clinical measurement of upper limb function in children with cerebral palsy" *Gait & Posture*, 2022.

J5. SK. Kim, **D. Park**, B. Yoo, D. Shim, JO. Choi, TY. Choi, ES. Park, "Overground robot-assisted gait training for pediatric cerebral palsy" *Sensors*, 2021.

J4. **D. Park**, J. Lim, D. Rha, "Analysis of gait adaptation pattern according to the change of slope angle during walking in young non-disabled adults" *Gait & Posture*, 2020.

J3. JE. Park, YJ. Seong, ES. Kim, **D. Park**, Y. Lee, H. Park, D. Rha, "Architectural changes in the medial gastrocnemius on sonography after nerve ablation in healthy adults" *Yonsei Medical Journal*, 2019.

J2. **D. Park**, YJ. Seong, H. Woo, B. Yoo, D. Shim, ES. Kim, D. Rha, "Paralysis of the gastrocnemius medial head differentially affects gait patterns and muscle activity during level and stair ascent locomotion" *Gait & Posture*, 2019.

J1. JY. Choi, ES. Park, **D. Park**, D. Rha, "Dynamic spasticity determines hamstring length and knee flexion angle during gait in children with spastic cerebral palsy" *Gait & Posture*, 2018.

Conference Papers & Abstracts

C1. H. Cho, I. Kang, **D. Park**, D. D. Molinaro, A. J. Young, "Real-Time Walk Detection for Robotic Hip Exoskeleton Applications," *International Symposium on Medical Robotics*, 2022.

A9. **D. Park**, A. J. Young, "Unified vs. Side-Specific TCN Models for Hip Moment Estimation in Stroke Survivors" *International Consortium for Rehabilitation Robotics*, 2024.

A8. **D. Park**, T. A. Harvey, Y. Mhaskar, K. Ghosnagi, R. Casey, K. R. Herrin, A. J. Young, "Enabling device-agnostic physiological state estimation for exoskeletons through body-mounted sensor suites" *American Society of Biomechanics*, 2024.

A7. **D. Park**, J. Lim, B. Yoo, D. Shim, J. Choi, TY. Choi, D. Rha, "The difference in gait adaptation pattern when the slope angle changes with or without prior notice" *Korean Academy of Rehabilitation Medicine*, 2020.

A6. **D. Park**, J. Lim, D. Rha, "Analysis of gait adaptation pattern according to the change of slope angle during walking in young non-disabled adults" *The European Society for Movement Analysis in Adults and Children*, 2020.

A5. **D. Park**, B. Yoo, D. Shim, D. Rha, "Validate predictive musculoskeletal simulation of gait adaptation in persons with medial gastrocnemius paralysis using physics-based predictive simulation" *Asia-Oceanian Conference of Physical & Rehabilitation Medicine*, 2020.

A4. **D. Park**, H. Woo, D. Rha, "Optimizing costs of a neuromuscular walking model in a physics-based predictive simulation: metabolic energy expenditure versus muscle fatigue" *Asia-Oceanian Conference of Physical & Rehabilitation Medicine*, 2020.

A3. **D. Park**, H. Woo, D. Rha, "Muscle compensation patterns in persons with medial gastrocnemius paralysis: Comparison of experimental data with musculoskeletal simulation results based on Computed Muscle Control (OpenSim 4.0)" *International Society of Biomechanics*, 2019.

A2. **D. Park**, H. Woo, B. Yoo, YJ. Seong, D. Rha, "Changes in kinematics during stair climbing in persons with gastrocnemius medial head paralysis" *World Congress of Biomechanics*, 2018.

A1. **D. Park**, YJ. Seong, ES. Kim, JY. Choi, D. Rha, "hanges in electromyographic signals during gait in persons with gastrocnemius medial head paralysis" *International Society of Biomechanics*, 2017.

Invited Talks

2025 **KAIST** *Daejeon, Republic of Korea*
Musculoskeletal Biodynamics Lab (Host: Prof. Seungbum Koo)

Title: Adaptive Hip Exoskeleton Control for Personalized Assistance with Daily Activities in Post-Stroke Survivors

2025 **Korea University** *Seoul, Republic of Korea*
Department of Artificial Intelligence (Host: Prof. Sungjoon Choi)

Title: Adaptive Hip Exoskeleton Control for Personalized Assistance with Daily Activities in Post-Stroke Survivors

2025 **Yonsei University** *Seoul, Republic of Korea*
Department of Rehabilitation Medicine (Host: Prof. Dongwook Rha)

Title: Adaptive Hip Exoskeleton Control for Personalized Assistance with Daily Activities in Post-Stroke Survivors

2024 **Emory University** *Atlanta, USA*
Department of Rehabilitation Medicine (Host: Prof. Benjamin Rogozinski)

Title: Exoskeleton Controller Adaptation to Variations in Stroke Patient Gait Patterns

2023 **Korea University** *Seoul, Republic of Korea*
Robot Intelligence lab (Host: Prof. Sungjoon Choi)

Title: Invariant Control Strategies using Deep Learning for Wearable Robotics

2023 | **WIRobotics** — *Suwon, Republic of Korea*
R&D Seminar (Host: CEO Younbaek Lee)

Title: Invariant Control Strategies using Deep Learning for Wearable Robotics

2023 | **Yonsei University** — *Seoul, Republic of Korea*
Department of Rehabilitation Medicine (Host: Prof. Dongwook Rha)

Title: Invariant Control Strategies using Deep Learning for Wearable Robotics

2021 | **Electronics and Telecommunications Research Institute (ETRI)** — *Daejeon, Republic of Korea*
Human Augmentation Lab

Title: Insights of Human Movement from Neuromusculoskeletal Simulation

Grant Contributions

2023 | **National Institutes of Health (NIH)** — *Total Funding: $944,400*
A new framework for self-adaptive artificial intelligence to personalize assistance for patients using robotic exoskeletons and prostheses

Project Number: 4DP2HD111709-02 (PI: Dr. Aaron Young)
Role: Significant Contributor (Assisted in drafting the proposal and spearheaded the research efforts)

Planned Grant Applications

2026 | **Schmidt Sciences in partnership with the Rhodes Trust** — *Target Submission: May 2026*
Schmidt Science Fellows

Proposed Pivot: From Rigid Robotics to Intelligent Soft Bio-Interfaces
Research Vision: Bridging the gap between soft materials science and artificial intelligence to develop self-calibrating, multimodal bioelectronics capable of ubiquitous physiological monitoring across diverse health conditions.

2026 | **National Institutes of Health (NIH)** — *Target Submission: Late 2026*
NIH K99/R00 Pathway to Independence Award

Proposed Topic: AI-Powered Multimodal Bioelectronics for Precision Digital Health
Research Vision: Leveraging high-fidelity soft sensors (biochemical, physical, and electrophysiological) and robust machine learning to discover novel digital biomarkers for early detection and long-term management of chronic neurological and cardiovascular diseases.

Mentorship

Ph.D. Students

Georgia Institute of Technology — *Atlanta, USA*

2024–Present | **Hangyeol Song**
Co-authored [J17], Fulbright Award Recipient

2023–Present | **Yash Mhaskar**
Co-authored [J14, 16], [A8], NSF GRFP Fellowship Recipient

Selected Undergraduate Students

Georgia Institute of Technology — *Atlanta, USA*

2025–Present | **Carson Wolff**
NSF-REU Fellowship Recipient

2025–Present | **Hannah Shin**

2025–Present | **Mitch Miller**

2025–Present | **Dongwon Jeong** *(Visiting Student from Yonsei University)*
US-Korea High-Tech Industry Exchange Scholarship Recipient

2024–Present | **Dash Katragadda**
NASA Achievement Award Recipient

2024–Present | **Dylen Liverman**
Co-authered [J15]

2024–Present | **Mackenzie Maxwell**

2023–2025 | **Sunny Park** *(now M.S Student at Georgia Institute of Technology)*
Co-authored [J16], PURA Fellowship Recipient

2022–2024 | **Jimin An** *(now Ph.D. Student at Carnegie Mellon University)*
Co-authored [J12], PURA Fellowship Recipient

2023 | **Melodie Walla** *(now M.S. Student at Stanford University)*

2022–2023 | **Michael Rodyushkin** *(now Software Engineer at Roblox)*

2021–2023 | **Rommel Montayre** *(now R&D Engineer at Medtronic)*

2021–2022 | **Jorik Stoop** *(now Ph.D. Student at Duke University)*

2021 | **Hang Man Cho** *(now Ph.D. Student at Columbia University)*
Co-authored [C1]

Yonsei University College of Medicine *Seoul, Republic of Korea*

2019–2020 | **Wonhee Lee** *(now Rehabilitation Medicine Resident at Severance Hospital)*
Co-authored [J9]

2018–2020 | **Junyoung Lim** *(now Orthopedic Surgery Resident at Severance Hospital)*
Co-authored [J4], [A6, 7]

2018–2019 | **Taesoo Lee** *(now Rehabilitation Medicine Resident at Severance Hospital)*

Mentoring Program

Nakatani RIES Fellowship *Atlanta, USA*

2023 | **Leo Tanaka** *(B.S. Student at Keio University)*

2022 | **Hirotaka Okada** *(B.S. Student at Tokyo University)*

References

Dr. Aaron Young
Doctoral Advisor
Associate Professor, Mechanical Engineering
Georgia Institute of Technology
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Dr. Gregory Sawicki
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Professor, Mechanical Engineering
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Dr. Dong-wook Rha, M.D., Ph.D.
Master's Advisor
Professor, Dept. of Rehabilitation Medicine
Yonsei University College of Medicine
medicus@yonsei.ac.kr

Dr. Trisha Kesar, PT, PhD
Collaborator/Doctoral Committee Member
Associate Professor, Rehabilitation Medicine
Emory University
trisha.m.kesar@emory.edu

Dr. Inseung Kang
Collaborator
Assistant Professor, Dept. of Mechanical Engineering
Carnegie Mellon University
inseung@cmu.edu