Gu-Cheol Jeong

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RESEARCH INTERESTS

Robot Hardware Design & Control • Collision Robust Robot Manipulator • System Dynamics Design • CAD Design to Simulation • Sim2Real

EDUCATION

The University of Texas at Austin   **Austin, TX**
Ph.D. Candidate in Mechanical Engineering   **Aug 2019 – Present**
Advisor: Dr. Ashish D. Deshpande

Kookmin University   **Seoul, South Korea**
Bachelor of Science in Mechanical System Engineering   **Mar 2010 – Aug 2016**

PROFESSIONAL APPOINTMENTS

Graduate Research Assistant, National Science Foundation (NSF)   Aug 2023 – Present
Principal Investigator: Dr. Lei Zhou and Dr. Ashish D. Deshpande
<u>Next-Generation Safe and Dexterous Robot Hands using High-Torque Direct-Drive Actuation</u>
- Project Goal: Create and demonstrate a new type of robot hand with excellent manipulation dexterity and contact safety without sacrificing strength and hardware simplicity

Graduate Research Assistant, Sony Research Award Program   Aug 2022 – Aug 2023
Principal Investigator: Dr. Lei Zhou and Dr. Ashish D. Deshpande
<u>High-torque Transparent Actuators For Next-Generation Interactive Robotic Hands</u>
- Project Goal: Develop the robotic hands with high strength, and safety, dexterity using the new actuator.

Research Scientist, Korea Institute of Science and Technology (KIST)   May 2017 – Aug 2019
Principal Investigator: Dr. Keehoon Kim   Seoul, South Korea
- Designed and Controlled Powered prosthesis / Powered Exoskeleton / Haptic Interface

Undergraduate Research Assistant, Kookmin University   Jul 2015 – Aug 2016
Principal Investigator: Prof. Baek-Kyu Cho   Seoul, South Korea
- Analyzed, Designed and Controlled Biomimetic Hopping Leg Robot based on MIT Junior Cheetah

TECHNICAL SKILLS

- **Engineering Software**: Python · C · MATLAB · R · LabVIEW · SOLIDWORKS
- **Dynamic Simulation**: MuJoCo · Simscape

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PROFESSIONAL SERVICE

Peer-Reviewed Article for:
- IEEE Robotics and Automation Letters (RA-L)
- IEEE International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Conference on Robotics and Automation (ICRA)

High School Research Academy (Summer 2024 – UT Austin):
Hardware Design Instructor
- Taught 30 high school students to assemble six BaRiFlex robotic hands; and guided them in collecting manipulation-task data for imitation learning;

TEACHING ACTIVITIES

The University of Texas at Austin, Austin, TX
Graduate Teaching Assistant, Department of Mechanical Engineering
- ME366J   Mechanical Engineering Design Methodology   Fall 2019
- ME318M   Programming & Engineering Computational Methods   Spring 2020
- ME380R   Robot Mechanism Design   Spring 2022

PEER REVIEWED ARTICLES

Journal Publication

[J2] **Gu-Cheol Jeong**, Stefano Dalla Gasperina, Ashish D. Deshpande, Lillian Chin and Roberto Martin-Martin, "BiFlex: A Passive Bimodal Stiffness Flexible Wrist for Manipulation in Unstructured Environments", Under Review in Robotics and Automation Letters, https://robin-lab.cs.utexas.edu/BiFlex/

[J1] Man Bok Hong, Sin Jung Kim, Yong Seok Ihn, **Gu-Cheol Jeong**, and Keehoon Kim, "*KULEX-Hand: An Underactuated Wearable Hand for Grasping Power Assistance*," IEEE Trans. Robot. 35, 420 –432 (2019)

Conference Proceedings

[C3] **Gu-Cheol Jeong**, Arpit Bahety, Gabriel Pedraza, Ashish D. Deshpande, and Roberto Martin-Martin, "BaRiFlex: A Robotic Gripper with Versatility and Collision Robustness for Robot Learning", In 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) , 2024, **Best Robot Mechanisms and Design paper**, https://robin-lab.cs.utexas.edu/bariflex

[C2] **Gu-Cheol Jeong**, Yeoeun Kim, Wooseong Choi, Hyun-Joo Lee, Sang Rok Oh, and Keehoon Kim, "*On the Design of a Novel Underactuated Robotic Finger Prosthesis for Partial Hand Amputation*", 2019 IEEE International Consortium for Rehabilitation Robotics 2019

[C1] **Gu-Cheol Jeong**, Kwon Joong Son, and Keehoon Kim, "*Miniaturization of Ultrasonic Variable-Friction Tactile Display*", Korea Robotics Society Annual Conference (KRoC 2018)

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HONORS AND AWARDS

- 'Sung-Gok' Academic Scholarship   Fall 2015
- Foreign Language Academy Achievement Scholarship   Spring 2016
- Exchange Program Scholarship   Fall 2014 & Spring 2015

EXTRA EXPERIENCE

Korea Army Training Center   Aug.2011 – May.2013
Sergeant, Military Trainer   Chungcheongnam-do, South Korea

- Managed the training of 13 recruits and subsequently earned a promotion to manager within a 200-member company.

'Journey To Get Happy' Volunteer Program   May. 2013 – Jul.2015
Volunteer   Gunpo-si, Korea

- Funded by City of Gunpo, Sponsored by Gunpo Youth Center, in collaboration with Nepal
- Participated in a community-engaged program between Gunpo Youth Center and Nepal Smile Orphanage, where volunteers and students raised funds to send 100kg of stationary to support Smile Orphange.

'Donghaeng' Teaching Volunteer Program   Sept.2013 – Jul.2014
Math Teacher   Seoul, Korea

- Taught underprivileged high school students every week for one semester

Exchange Student   Jul.2014 – Jul.2015
Student Representative from Kookmin University   Nevada, United States

- Promoted Korean culture at the University of Nevada, Reno

COLLABORATORS / REFERENCES

- **Prof. Ashish D. Deshpande**: Professor, UT Austin [contact]
- **Prof. Roberto Martin-Martin:** Assistant Professor, UT Austin [contact]
- **Prof. Lei Zhou:** Assistant Professor, UW-Madison [contact]
- **Prof. Lillian Chin:** Assistant Professor, UT Austin [contact]
- **Prof. Ben Abbatematteo:** Assistant Professor, UT Austin [contact]
- **Prof. Keehoon Kim:** Associate Professor, POSTECH [contact]
- **Stefano Dalla Gasperina**: Postdoctoral Researcher, UT Austin [contact]