

# Jeeseop Kim

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## CONTACT INFORMATION

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Blacksburg, VA 24061, USA

## RESEARCH INTERESTS

My primary academic interests span robotics, control theory, optimization, dynamical systems, and machine learning. My research goal is to establish a firm foundation that will extend the state-of-the-art methods for designing resilient and intelligent control algorithms for a wide range of collaborative work. This overview includes but is not limited to 1) collaborative multi-agent systems with decentralized and distributed control policies, 2) autonomous robots and human assist systems for various applications, 3) wearable robots like prostheses and orthoses to improve the quality of life for persons, 4) agile robots with human/animal morphology.

My research has a clear blueprint from theoretical developments to experimental validations to achieve two specific objectives: 1) Creating algorithms to systematically design robust and intelligent controllers for high-dimensional and complex hybrid dynamical systems; and 2) Transferring the control framework into practice with a highly dynamic robot platform. These algorithms advance knowledge in the design of feedback controllers for dynamical models arising from various collaborative works that I target. The theoretical innovations also offer a unique opportunity to advance human-robot interaction, robotic legged locomotion, robot-assisted walking, bio-inspired robotic technologies.

## ACADEMIC HISTORY

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<b>Ph.D. Candidate in Mechanical Engineering</b> advisor: Prof. Kaveh Akbari Hamed Virginia Polytechnic Institute and State University, USA	September 2017 - Expected in 2022
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<b>M.S. in Transdisciplinary Studies (Program in Intelligent Systems)</b> advisor: Prof. Jaeheung Park Seoul National University, South Korea	March, 2017
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<b>B.S. in Mechanical and Aerospace Engineering</b> Seoul National University, South Korea	March, 2014
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## PROFESSIONAL EXPERIENCE

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<b>Graduate Research Assistant</b> Dept. of Mechanical Engineering, Virginia Tech, Blacksburg, USA Advisor: Prof. Kaveh Akbari Hamed	Aug. 2019 - Present
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<b>Graduate Research Assistant</b> Dept. of Mechanical Engineering, Virginia Tech, Blacksburg, USA Advisor: Prof. Tomonari Furukawa	Aug. 2017 - Jul. 2019
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<b>Graduate Research Assistant</b> Dept. of Transdisciplinary Studies, Seoul National University, South Korea Advisor: Prof. Jaeheung Park	Jan. 2014 - Jul. 2017
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<b>Undergraduate Research Assistant</b> Dynamic Robotic Systems Lab, Seoul National University, South Korea Supervisor: Prof. Jaeheung Park	Jun. 2013 - Sep. 2013
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## Undergraduate Research Assistant

Biorobotics Lab, Seoul National University, South Korea  
Supervisor: Prof. Kyu-Jin Cho

Mar. 2012 - Feb. 2013

## TEACHING EXPERIENCE

### Teaching Assistant

Dept. of Mechanical Engineering, Virginia Tech, Blacksburg, USA  
ME5524: Bayesian Robotics  
ME5984: Advanced Experimental Robotics

### Teaching Assistant

Dept. of Transdisciplinary Studies, Seoul National University, South Korea  
493.601: Convergent Robotics Technology  
493.611: Dynamics and Control of Robot-Environment Interaction

## PATENT

[P2] **Jeeseop Kim**, *et al*, Automatic cardiopulmonary resuscitation device and control method therefor, 2019. No. 20190029919A1 (US Patent), No. 108697572A (CN Patent), No. 3409258A1 (EU Patent)

[P1] **Jeeseop Kim**, *et al*, Apparatus for automatic cardiovascular pulmonary resuscitation, 2016. Korea Patent No.10-2016-0172286.

## PEER-REVIEWED JOURNAL ARTICLES

*In preparation*

[J5] **J. Kim**, and K. Akbari Hamed, Collaborative locomotion with communication delay via distributed MPC, In preparation, January, 2022.

*Published*

[J4] **J. Kim**, and K. Akbari Hamed, Cooperative locomotion via supervisory predictive control and distributed nonlinear controllers, ASME Journal of Dynamic Systems, Measurement, and Control, Vol. 144, Issue. 3, pp. 031005-1-031005-15, Mar, 2022.

[J3] R. T. Fawcett, A. Pandala, **J. Kim**, and K. Akbari Hamed, Real-time planning and nonlinear control for quadrupedal locomotion with articulated tails, ASME Journal of Dynamic Systems, Measurement, and Control, Vol. 143, Issue. 7, pp. 071004-1-071004-15, Jul, 2021.

[J2] K. A. Hamed, **J. Kim**, A. Pandala, Quadrupedal locomotion via event-based predictive control and QP-based virtual constraints, IEEE Robotics and Automation Letters, Vol. 5, Issue. 3, pp. 4463-4470, Jul, 2020.

[J1] **J. Kim**, Y. Omori, A. Sifat, and T. Furukawa, Adjustably designed torque controlled humanoid platform, International Journal of Mechanical and Production Engineering, Vol. 7, Issue. 2, pp. 52-57, May, 2019.

## PEER-REVIEWED CONFERENCE ARTICLES

*Published*

[C4] **J. Kim**, Y. Omori, A. Sifat, and T. Furukawa, Adjustably designed torque controlled humanoid platform, International Conference on Control, Automation, Robotics and Vision Engineering, Washington DC, USA, 21-22 Nov, 2018.

[C3] **J. Kim**, M. Kim, and J. Park, Improvement of humanoid walking control by compensating actuator elasticity, International Conference on Humanoid Robots (ICHR), Cancun, Mexico, 15-17 Nov, 2016.

[C2] J. Jung, **J. Kim**, S. Kim, W. Kwon, S. Na, K. Kim, J. Lee, G. Suh, and J. Park, Application

of robot manipulator for cardiopulmonary resuscitation, International Symposium on Experimental Robotics (ISER), Tokyo, Japan, 3-6 Oct, 2016.

[C1] **J. Kim**, M. Kim, and J. Park, Improvement of humanoid gait stability using reduction gear deformation model, The 31st Institute of Control, Robotics and Systems (ICROS), Seoul, Korea, 10-11 Mar, 2016.

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## HONORS

### Awards

The Best Presentation Award, Institute of Control, Robotics and Systems 2016	2016
Darpa Robotics Challenge DRC Finalist	2015
The Best Presentation Award from Bachelor Thesis Presentation, Seoul National University	2012

### Graduate Fellowship

Research Assistant Scholarships, Virginia Tech, Blacksburg, USA	Jul. 2017 - present
Gwan-ak Scholarship, Seoul National University, Seoul, South Korea	Mar. 2014 - Feb. 2015

### Undergraduate Fellowship

National Scholarship from Korea Student Aid Foundation, South Korea	Mar. 2009 - Feb. 2010
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## ACADEMIC SERVICES

### Reviewer

IEEE American Control Conference (ACC), 2022  
IEEE International Conference on Robotics and Automation (ICRA), 2022  
IEEE Conference on Decision and Control (CDC), 2021  
IEEE International Conference on Intelligent Robots and Systems (IROS), 2021  
IEEE International Conference on Robotics and Automation (ICRA), 2021  
IEEE Conference on Decision and Control (CDC), 2020  
IEEE International Conference on Robotics and Automation (ICRA), 2020

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## PROFESSIONAL SKILLS

○ Robotics	△ Control Theory	□ Hybrid Dynamical Systems
○ Autonomous Robots	△ Nonlinear Control	□ Multiagent Systems
○ Robot Locomotion	△ Distributed Control	□ Optimization
○ Cooperative Robotics		

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## TECHNICAL SKILLS

**Operating Systems:** Ubuntu(Linux), ROS  
**Programming Language:** C/C++, Python, MATLAB  
**Design and Simulation Software:** Solidworks, Unigraphics(NX)

*References available upon request*

*last Updated: January 05, 2022*