

Justin Yim

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EDUCATION

University of California - Berkeley 2015-2020

PhD, Electrical Engineering

University of Pennsylvania 2010-2015

MSE Robotics

BSE Double Major Mechanical Engineering and Electrical Engineering

RESEARCH AND WORK EXPERIENCE

Assistant Professor Beginning Jan 2023

University of Illinois Urbana-Champaign

Mechanical Science and Engineering Department

Postdoctoral Researcher 2020-2022

Robomechanics Lab - Carnegie Mellon University

Legged robotics research supported by the 2020 Computing Innovation Fellowship.

Postdoctoral Researcher Summer 2020

Biomimetic Millisystems Lab - University of California Berkeley

Graduate Student Researcher 2015-2020

Biomimetic Millisystems Lab - University of California, Berkeley

Hopping Control and Estimation for a High-performance Monopedal Robot, Salto-1P [2-4], [6-8], [10].

Undergraduate Research Assistant Summer 2014

Collective Dynamics and Controls Lab - University of Maryland

Pursuit control with autonomous hovercraft [1], [5].

Instrumentation Intern Summer 2013

SpaceX

Intern Summer 2012

KMel Robotics

Undergraduate Research Assistant 2011-2012

Dr. Daniel Lee's lab - University of Pennsylvania

Autonomous quadrotor landing and charging using monocular visual servoing.

GRANTS

Army Research Office Grant 2017-2020

Legged Locomotion on Compliant Terrain

Helped write successful grant proposal.

TEACHING

EE192: Mechatronics Design Lab Spring 2019
GSI Teaching Assistant

Lectured lab sections and built demos for semester-long line racing car project.

EE16B: Designing Information Devices and Systems II Spring 2017
GSI Teaching Assistant

Led discussion section and developed homeworks and discussion worksheets.

Mentoring

PhD candidate

Mentored two undergraduates and one master's student resulting in two co-authored publications and a master's thesis.

Postdoctoral researcher

Mentored a master's student and four undergraduate students resulting in a co-authored publication and a master's thesis.

HONORS AND AWARDS

CMU Mechanical Engineering Outreach Stars Silver level 2021-2022

ICRA 2022 6th Workshop on Legged Robots Best Paper 2022
"Quad-SDK: Full Stack Software Framework for Agile Quadrupedal Locomotion."

ICRA 2022 Outstanding Locomotion Paper Finalist 2022
"Scalable Minimally Actuated Leg Extension Bipedal Walker Based on 3D Passive Dynamics." [12]

Robotics: Science and Systems (RSS) Pioneer 2021

ICRA 2021 Outstanding Reviewer Award 2021

Computing Innovation Fellow 2020
Two year postdoctoral fellowship by the Computing Research Association (CRA) and Computing Community Consortium (CCC).

Demetri Angelakos Memorial Achievement Award 2020
Awarded to a UCB EECS PhD student who takes the time to help colleagues beyond the normal cooperation existing between fellow students.

ICRA 2019 Best Student Paper Award 2019
"Drift-free Roll and Pitch Estimation for High-acceleration Hopping." [8] ICRA is the IEEE RAS flagship conference with 2916 papers submitted and 1389 accepted.

IROS 2017 Best Paper Award 2017
"Repetitive Extreme-acceleration (14-g) Hopping with Salto-1P." [6] IROS is the second largest robotics conference with 2164 papers submitted and 970 accepted.

NSF Graduate Research Fellowship Program Honorable Mention 2016

Ralph Teetor Award 2014
Awarded to one UPenn ME senior for ingenuity, creativity, scholarship, & service.

Norman Gross Senior Design Project Award 2014
University of Pennsylvania ESE Department senior design top award.

All-SEAS Senior Design Second Place 2014

University of Pennsylvania School of Engineering and Applied Sciences
Rachleff Scholars Best Presentation and Poster
University of Pennsylvania School of Engineering and Applied Sciences

2012

INVITED TALKS AND GUEST LECTURES

University of Illinois Urbana Champaign Invited Talk “Unconventional Locomotion: Hopping, Leaping, and Disentangling”	March 2022
George Mason University Invited Talk “Unconventional Locomotion: Hopping, Leaping, and Disentangling”	March 2022
Columbia University Invited Talk “Unconventional Locomotion: Hopping, Leaping, and Disentangling”	February 2022
UC Santa Barbara Invited Talk “Unconventional Locomotion: Hopping, Leaping, and Disentangling”	February 2022
University of Michigan Invited Talk “Unconventional Locomotion: Hopping, Leaping, and Disentangling”	January 2022
Purdue University Invited Talk “Unconventional Locomotion: Hopping, Leaping, and Disentangling”	January 2022
CMU Guest Lecture: Robot Design and Experimentation “Locomotion and Gaits”	February 2021
CMU Joint Guest Lecture: Linear Control Systems “Legged robot control and estimation: hopping”	December 2020
University College London RPL Lab Robotics Seminar “Saltatorial Locomotion on Terrain Obstacles”	November 2020
University of Pennsylvania MEAM/GRASP Seminar “Saltatorial Locomotion on Terrain Obstacles”	November 2020
Carnegie Mellon University Locomotion Seminar “Saltatorial Locomotion on Terrain Obstacles”	September 2020
Massachusetts Institute of Technology Invited Talk “Saltatorial Locomotion on Terrain Obstacles”	February 2020
UCB Guest Lecture: Introduction to Robotics “Salto-1P: Control and Estimation Experiments”	November 2019
UCB Guest Lecture: Feedback Control of Legged Robots “Salto-1P: Saltatorial Locomotion on Terrain Obstacles”	Nov 2018 & 2019
Italian Institute of Technology Invited Talk “Salto-1P: Saltatorial Locomotion on Terrain Obstacles” Master Class: “Building Small Robots”	November 2018

SERVICE AND LEADERSHIP

Robomechanics Lab CAD outreach

2021-2022

Co-led development of a remote CAD lesson for middle school girls in the Pittsburgh area in partnership with the nonprofit Gwen's Girls.

CMU MechE DEI Mentorship Subcommittee 2020-2021

Subcommittee member

Launched a peer mentoring program and professional development series to support undergraduate students, graduate students, and staff in the MechE department.

Robotics: Science and Systems Conference 2021 Inclusion@RSS 2021

Co-organizer

Coordinated workshop programming and conference attendance support for 44 fellows from groups traditionally underrepresented in robotics.

Electrical Engineering Outreach 2017-2020

Graduate Student Association Officer and Steering Committee Representative

Coordinated over 100 in-classroom elementary school science lessons by graduate students with the nonprofit Community Resources for Science (CRS).

Penn Electric Racing 2011-2012

Mechanical Team Co-captain

Science and Technology Wing Residential Program 2011-2012

Workroom Manager

PUBLICATIONS

- [12] S. Islam*, K. Carter*, **J. K. Yim***, J. Kyle, S. Bergbreiter, and A. M. Johnson, "Scalable Minimally Actuated Leg Extension Bipedal Walker Based on 3D Passive Dynamics," *IEEE Int. Conf. Robot. Automation (ICRA)*, 2022. (**Outstanding Locomotion Paper Finalist**)
- [11] J. Liang, Y. Wu, **J. K. Yim**, H. Chen, M. Zicong, H. Liu, Y. Liu, Y. Liu, D. Wang, W. Qui, Z. Shao, M. Zhang, X. Wang, J. Zhong, and L. Lin, "Electrostatic footpads enable agile insect-scale soft robots with trajectory control," *Science Robotics*, 2021.
- [10] **J. K. Yim**, B. R. P. Singh, E. K. Wang, R. Featherstone, R. S. Fearing, "Precision Robotic Leaping and Landing Using Stance-phase Balance," *Robotics and Automation Letters*, 2020.
- [9] Y. Wu, **J. K. Yim**, J. Liang, Z. Shao, M. Qi, J. Zhong, Z. Luo, X. Yan, M. Zhang, X. Wang, R. S. Fearing, R. J. Full, L. Lin, "Insect-scale fast moving and ultrarobust soft robot," *Science Robotics*, 2019.
- [8] **J. K. Yim**, E. K. Wang, R. S. Fearing, "Drift-free Roll and Pitch Estimation for High-acceleration Hopping," *IEEE Int. Conf. Robot. Automation (ICRA)*, 2019. (**Best Student Paper**)
- [7] **J. K. Yim**, R. S. Fearing, "Precision Jumping Limits from Flight-phase Control in Salto-1P," *IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, 2018.
- [6] D. W. Haldane*, **J. K. Yim***, R. S. Fearing, "Repetitive Extreme-acceleration (14g) Spatial Jumping with Salto-1P," *IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, 2017. (**Best Paper**)

*denotes equal contribution

- [5] D. Shishika, **J. K. Yim**, D. A. Paley, “Robust Lyapunov Control Design for Bioinspired Pursuit With Autonomous Hovercraft,” *IEEE Trans. Contr. Syst. Tech.*, vol. 25, iss. 2, pp. 509-520, 2017.
- [4] M. M. Plecnik, D. W. Haldane, **J. K. Yim**, R. S. Fearing, “Design Exploration and Kinematic Tuning of a Power Modulating Jumping Monopod,” *J. of Mechanisms and Robotics*, vol. 9, iss. 1, 2016.
- [3] D. W. Haldane, M. M. Plecnik, **J. K. Yim**, R. S. Fearing, “Robotic Vertical Jumping Agility via Series-elastic Power-modulation,” *Science Robotics*, vol. 1, iss. 1, 2016.
- [2] D. W. Haldane, M. M. Plecnik, **J. K. Yim**, R. S. Fearing, “A Power Modulating Leg Mechanism for Monopedal Hopping,” *IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, pp. 4757-4764, 2016.
- [1] D. Shishika, **J. K. Yim**, D. A. Paley, “Bio-inspired pursuit with autonomous hovercraft using Lyapunov-based control,” *American Control Conf. (ACC)*, 2015.

WORKSHOPS

- J. Norby, Y. Yang, A. Tajbakhsh, J. Ren, **J. K. Yim**, A. Stutt, Q. Yu, N. Flowers, A. Johnson, “Quad-SDK: Full Stack Software Framework for Agile Quadrupedal Locomotion,” *ICRA Workshop: 6th Workshop on Legged Robots*, 2022. (**Best Paper**)
- J. K. Yim**, “Limb mechanisms for performance,” *RSS Pioneers*, 2021.
- J. K. Yim**, K. R. Carter, S. Islam, S. Bergbreiter, A. Johnson, “3D Passive Dynamics-inspired Walking Actuated by Open Loop Leg Extension,” *Dynamic Walking*, 2021.
- J. K. Yim**, E. K. Wang, R. S. Fearing, “Unsupported Monopedal Hopping Outdoors,” *ICRA Workshop: Towards Real-World Deployment of Legged Robots*, 2019. (**Best Poster Finalist**)
- J. K. Yim**, R. S. Fearing, “Precision Jumping with a SLIP-like Robot,” *IROS Workshop: Modeling and Control of Dynamic Legged Locomotion*, 2018.

REVIEW ACTIVITY

- 2018 IEEE International Conference on Robotics and Automation (ICRA)
- 2018 Soft Robotics
- 2019 IEEE International Conference on Humanoid Robots (Humanoids)
- 2019 IEEE International Conference on Robotics and Automation (ICRA)
- 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- 2020 IEEE Robotics and Automation Letters
- 2020 AAAS Science Robotics
- 2020 IEEE Transactions on Robotics
- 2020 Soft Robotics
- 2021 IEEE International Conference on Robotics and Automation (ICRA) (**outstanding reviewer award**)
- 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- 2021 IEEE Transactions on Robotics
- 2022 IEEE Robotics and Automation Letters (RA-L)