

JOSEPH NORBY

Curriculum Vitae

CONTACT

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EDUCATION

Ph.D., Mechanical Engineering

Aug 2022

Carnegie Mellon University, Pittsburgh, PA

Thesis: *Enabling Autonomous Legged Robot Agility*

Advisor: Aaron M. Johnson

B.S., Mechanical Engineering

May 2016

University of Notre Dame, Notre Dame, IN

Advisor: James Schmiedeler

WORK EXPERIENCE

Software Engineer

July 2022 –

Apptronik Inc., Austin, TX

Graduate Student Researcher, Robomechanics Lab

Aug 2016 – Jun 2022

Department of Mechanical Engineering, Carnegie Mellon University

Teaching Assistant, Robot Dynamics & Analysis and Undergraduate Dynamics

Fall 2017 – 2018

Department of Mechanical Engineering, Carnegie Mellon University

STEM Course Instructor

Summer 2015 – 2016

Leonardo's Basement, Minneapolis, MN

Undergraduate Student Researcher, Locomotion and Biomechanics Laboratory

Spring 2015 – 2016

Dept. of Aerospace and Mechanical Engineering, University of Notre Dame

Mechanical Engineering Intern

Summer 2014

Ziegler CAT, Shakopee, MN

AWARDS AND HONORS

Best Workshop Paper, ICRA Workshop on Legged Robotics

May 2022

Jeremiah Mpagazehe Student Service Award, Carnegie Mellon University

May 2022

Graduate Research Fellowship, National Science Foundation

May 2016

Engineering Honors Program Member, University of Notre Dame

2013 - 2016

Dean's List 2012-2016, University of Notre Dame

2012 - 2016

Eagle Scout, Boy Scouts of America

2012

PUBLICATIONS

Joseph C. Norby, Jun Yang Li, Cameron C. Selby, Amir Patel, and Aaron M. Johnson. "Enabling dynamic behaviors with aerodynamic drag in lightweight tails," *IEEE Transactions on Robotics*. **2021**

Joseph Norby and Aaron M. Johnson. "Fast global motion planning for dynamic legged robots," in *Proceedings of the IEEE/RSJ Intl. Conference on Intelligent Robots and Systems*, Las Vegas, NV. **2020**

POSTERS AND ABSTRACTS

Joseph Norby, Yanhao Yang, Ardalan Tajbakhsh, Jiming Ren, et al. "Quad-SDK: Full stack software framework for agile quadrupedal locomotion," in ICRA Workshop on Legged Robots
Best Workshop Paper **2022**

Yanhao Yang, **Joseph Norby**, Justin K. Yim, and Aaron M. Johnson. "Proprioception and tail control enable extreme terrain traversal by quadruped robots," in ICRA Workshop on Legged Robots **2022**

Yanhao Yang, **Joseph Norby**, Justin K. Yim, and Aaron M. Johnson. "Improving tail compatibility through sequential distributed model predictive control," in RSS Workshop on Software Tools for Real Time Optimal Control **2021**

Joseph Norby, Jun Yang Li, Cameron C. Selby, Amir Patel, and Aaron M. Johnson. "Leveraging aerodynamic drag for tails in legged robot locomotion," in *American Physical Society (APS) March Meeting*. **2021**

Michael R. Turski, **Joseph Norby**, and Aaron M. Johnson. "Contact-implicit vs. hybrid trajectory optimization: Performance comparison," in *Dynamic Walking, Virtual* **2020**

Joseph Norby and Aaron M. Johnson. "Tail actuation improves quadrupedal robot acceleration," in *Dynamic Walking*, Canmore, Canada **2019**

Joseph Norby and Aaron M. Johnson. "Towards energy optimal design and control of tailed legged robot locomotion," in *Robotics: Science and Systems Workshop on "Unusual Appendages"*, Pittsburgh, PA **2018**

Joseph Norby and James Schmiedeler, "Modifying Virtual Constraints to Improve Simulated Biped Robot Stability," in *Dynamic Walking*, Holly, MI **2016**

THESIS AND TECHNICAL REPORTS

Joseph Norby, "Enabling Autonomous Legged Robot Agility," Ph.D. thesis, Department of Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA **2022**

Hannah He, **Joseph Norby**, Sean Wang, Natasha Sihota, et al. "Environmental sampling with the boustrophedon decomposition algorithm," arXiv, Tech. Rep. arXiv:2207.06209 [cs.RO] **2022**

PROFESSIONAL AND EDITORIAL

Professional Memberships: The Institute of Electrical and Electronics Engineers (IEEE), American Physical Society (APS)

Journal and Conference Reviews: IEEE Transactions on Robotics, IEEE Robotics and Automation Letters, IEEE/RSJ Intl. Conference on Intelligent Robots and Systems, IEEE International Conference on Robotics and Automation

TALKS

- Seattle Robotics Society**, June Monthly Meeting **2021**
- Carnegie Mellon University**, Locomotion Seminar **2017 & 2019**
- University of Notre Dame**, Undergraduate Research Showcase **2016**

MEDIA APPEARANCES

- Tech Xplore**, *Tailing new ideas: Cheetah-inspired design enables enables better robot movement* - Article with quote **2021**
- IEEE Spectrum - Automation**, *The Cheetah's Fluffy Tail Points The Way for Robots With High-Speed Agility* - Article with quote **2021**
- Carnegie Mellon University**, *Tailing New Ideas* - Press Release **2021**
- Twin Cities PBS**, *How to Build an Engineer* - Video interview **2020**
- Carnegie Mellon University**, *24-775 Robot Design and Experimentation: Galago* - Video spotlight with interview **2018**

MENTORING AND COMMUNITY

- Co-chair**, CMU MechE DEI Task Force Representation Subcommittee **2020 – 2022**
- Featured Presenter & Mentor**, CMU Gelfand Center Road2Reaserch Meet the Researcher program **2020 – 2021**
- Research Mentor**, Robomechanics Lab graduate and undergraduate students **2016 – 2022**