

# HAOSEN (RUSSELL) XING

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## Research Interest

Control – optimal control and real-time optimization of human assistive devices

Learning – reinforcement learning, deep learning

## Education

M.S. Mechanical Engineering, Carnegie Mellon University 2017 – 2019

- Advisor: Howie Choset

B.S. Mechanical Engineering, University of California, Irvine 2013 – 2016

## Proficient Skills

*Tools:* Biomechanics, Locomotion, Control Theory,  
Mathematical Modeling, Engineering Optimization, Robot Dynamic Analysis,  
(Deep) Reinforcement Learning, Machine Learning,  
Finite Element Analysis, Microsoft Office Tools

*Design:* SolidWorks, Rhino

*Programming:* Arduino, C++, MATLAB, Python (PyTorch), LaTeX

## Research Experience

Research Assistant, Carnegie Mellon University, PA May 2019 – Current  
(Advisor: Prof. Chris Atkeson and Dr. Ge Lv)

- Task-Invariant Control and Design of Lower-Limb Exoskeletons

Graduate Research Student, Carnegie Mellon University, PA Oct 2017 – May 2019  
(Advisor: Prof. Howie Choset)

- Inertial Tail-like Appendage Use in Quadruped Improves Stability in Diagonal Sequence Walking Gaits
- Tail Use in Quadruped Improves Static Stability in Diagonal Sequence Walking Gaits
- Legged System Gait Design and Stability Analysis Using Hildebrand Diagram
- Geometric Mechanics and Quadruped Back-bending

Research Intern, Zhejiang University, China Apr 2017 – Jun 2017  
(Advisor: Dr. Dongliang Zhang)

- Lower-body Fitting Robot CAD Design and Control

Undergraduate Research Assistant, University of California, Irvine Mar 2016 – May 2017  
(Advisor: Prof. John Larue)

- Analyze the Decay of Kinetic Energy Downstream with Turbulence using Wind Tunnel

Undergraduate Research Assistant, University of California, Irvine Mar 2016 – Jun 2016  
(Advisor: Dr. Yun Wang)

- Micro Generator Design

## Leadership, Honor and Activities

UCI SAE Savage Team – Aero/Body Team Leader

UCI Deans Honor List (2013 - 2016)

Pi Tau Sigma Honor Society (Former Vice President)

## Publications

B. Chong, Y. Aydin, G. Sartoretti, J. Rieser, C. Gong, **Haosen Xing**, H. Choset, D. Goldman, [A Hierarchical Geometric Framework to Design Locomotive Gaits for Highly Articulated Robots](#), Robotics: Science and Systems, 2019

B. Chong, Y. Aydin, C. Gong, G. Sartoretti, Y. Wu, J. Rieser, **Haosen Xing**, J. Rankin, K. Michel, A. Nicieza, J. Hutchinson, D. Goldman, H. Choset, [Coordination of back bending and leg movements for quadrupedal locomotion](#), Robotics: Science and Systems, 2018

## Abstracts & Workshops

**Haosen Xing**, B. Chong, G. Sartoretti, J. Whitman, Y. Aydin, D. Goldman, H. Choset, [Inertial Tail-like Appendage Use in Quadrupeds Improves Stability in Diagonal Sequence Walking Gaits](#), American Physical Society 2019, March 2019

B. Chong, Y. Aydin, G. Sartoretti, J. Rieser, **Haosen Xing**, C. Gong, H. Choset, D. Goldman, [Coordination of legs and body undulation during turning in quadruped locomotion](#), American Physical Society 2019, March 2019

**Haosen Xing**, B. Chong, G. Sartoretti, D. Goldman, and H. Choset, [Tail Use in Quadruped Improves Static Stability in Diagonal Sequence Walking Gaits](#), Robotics: Science and Systems 2018, June 2018

B. Chong, Y. Aydin, J. Rieser, Y. Wu, **Haosen Xing**, H. Choset, D. Goldman, [The importance of body-limb coordination in a walking tetrapod](#), American Physical Society 2018, March 2018

## Academic Projects

Carnegie Mellon University

- Obstacle Avoidance Trajectory Optimization
- Policy Gradient Tutorial
- Grid World Navigation Using Deep Reinforcement Learning
- Develop a Simple Image Processing Application Named FinePixel Using C++

## Academic Services

Conference Reviewer

- Robotics: Science and Systems, 2019

## Courses Highlighted

Engineering Optimization (24-785)

Machine Learning (10-601)

Deep Reinforcement Learning & Control (10-703)

Robot Dynamics and Analysis (24-760)

Statistical Techniques in Robotics (16-831)

Sensing & Sensors (16-722)

Kinematic, Dynamic and Control (16-711)

Engineering Computation (24-780)

Numerical Method in Engineering (16-831)

Lightweight Structure (ENGRMAE 157)