

HAOSEN (RUSSELL) XING

haosenx (at) andrew dot cmu dot edu; <http://russellksing.github.io>; 949-537-6300

Research Interest

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

Learning – reinforcement learning / deep learning for locomotion

Education

M.S. Mechanical Engineering, Carnegie Mellon University

May 2019

- Advisor: Howie Choset

B.S. Mechanical Engineering, University of California, Irvine

Jun 2017

- Graduated with *Cum Laude* honor

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, Mathematica

Research Experience

Research Assistant, Carnegie Mellon University, PA

May 2019 – Current

(Advisor: [Prof. Chris Atkeson](#) and [Dr. Ge Lv](#))

- Task-Invariant Control and Experimental Testing of Lower-Limb Exoskeletons

Graduate Research Student, Carnegie Mellon University, PA

Oct 2017 – May 2019

(Advisor: [Prof. Howie Choset](#))

- Inertial Tail 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: [Prof. 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 and 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)