Yujiong Liu

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Education

Virginia Tech — Blacksburg VA, USA
Ph.D. in Robotics, GPA: 4.00/4.00, Advisor: Prof. Pinhas Ben-Tzvi — 2017–Current

University of Minnesota, Duluth — Duluth MN, USA
M.S. in Mathematics, GPA: 4.00/4.00, Advisor: Prof. Bruce Peckham — 2015–2017

Harbin Institute of Technology — Harbin, China
M.S. in Robotics, GPA: 82.5/100, Advisor: Prof. Minxiu Kong — 2013–2015

Tongji University — Shanghai, China
B.S. in Mechanical Engineering, GPA: 4.11/5.00 — 2009–2013

Experience

Virginia Tech — Blacksburg VA, USA
Graduate Research Assistant and Lab Manager at the Robotics & Mechatronics Lab — Fall 2017–Current

- Development of a novel quadruped robot with a serpentine robotic tail
- Development of three novel cable/rod driven serpentine mechanisms

University of Minnesota, Duluth — Duluth MN, USA
Student at the Applied Math Department — Fall 2015–Spring 2017

- Investigated the dynamic behaviors of a singular perturbed quadratic map

Harbin Institute of Technology — Harbin, China
Graduate Research Assistant at the State Key Laboratory of Robotics and System — Fall 2013–Spring 2015

- Developed an adaptive controller for the Delta robot
- Developed a novel forward kinematics for the H4 robot

Selected Publications

[1] **Liu, Y.** and Ben-Tzvi, P., "Systematic Development of a Novel, Dynamic, Reduced Complexity Quadruped Robot Platform for Robotic Tail Research", *2022 IEEE International Conference on Robotics and Automation (ICRA)*, Philadelphia, PA, USA, May 23-27, 2022.

[2] **Liu, Y.** and Ben-Tzvi, P., 2021, "Dynamic Modeling, Analysis, and Design Synthesis of a Reduced Complexity Quadruped with a Serpentine Robotic Tail", *Integrative and Comparative Biology*, 61(2), pp. 464–477

[3] **Liu, Y.** and Ben-Tzvi, 2021, "A New Extensible Continuum Manipulator Using Flexible Parallel Mechanism and Rigid Motion Transmission", *Journal of Mechanisms and Robotics, Transactions of the ASME*, 13(3), p. 031112

[4] **Liu, Y.** and Ben-Tzvi, P., 2021, "Dynamic Modeling, Analysis, and Comparative Study of a Quadruped with Bio-inspired Robotic Tails", *Multibody System Dynamics*, 51(2), pp. 195-219

[5] **Liu, Y.**, Wang, J. and Ben-Tzvi, P., 2019, "A Cable Length Invariant Robotic Tail Using a Circular Shape Universal Joint Mechanism", *Journal of Mechanisms and Robotics, Transactions of the ASME*, 11(5), p. 051005

[6] Ben-Tzvi, P. and **Liu, Y.**, 2021, "Robots With Tails", *ASME Mechanical Engineering Magazine*, 143(6), pp. 32-37, Read the Story Online

Teaching

- **Graduate Teaching Assistant** at Virginia Tech — Fall 2018–Spring 2019
  Mechanical Engineering Lab I and II (ME4005 and 4006)
- **Graduate Teaching Assistant** at University of Minnesota, Duluth — Fall 2015–Spring 2017
  Numerical Analysis (MATH3810), Calculus III (MATH3298), Finite Math (MATH1160)

Selected Awards

- 3rd Place of the 2022 Paul E. Torgersen Graduate Student Research Excellence Award (PhD Category), College of Engineering, Virginia Tech — 2022
- Outstanding Graduate Student of the Mechatronics School, Harbin Institute of Technology — 2015
- First Class Scholarship, Harbin Institute of Technology — 2013, 2014
- First Class Prize of the 5th National College Mechanical Innovation Design Competition — 2012
- National Encouragement Scholarship, Ministry of Education, P.R. China — 2011
- Outstanding Student of the Mechanical Engineering Department, Tongji University — 2011

Mentorship

- **Graduate Students:** Shikhar Kashyap, Isaac Pressgrove
- **Undergraduate Students:** Alex Broz, Logan Stevenson, One senior design team of 7 students

Skills

- **Mathematics:** Modeling, Mechanics, Dynamics, Control, Optimization
- **Design and Manufacturing:** Mechanical Design, PCB Design, CNC
- **Integration:** Embedded Linux, ARM Mbed, ROS
- **Coding:** C/C++, Matlab

Academic Memberships

- American Society of Mechanical Engineers (ASME), Student Member — 2019–present
- Institute of Electrical and Electronics Engineers (IEEE), Student Member — 2019–present
- Mathematical Association of America (MAA), Student Member — 2015–2017

References

Dr. Pinhas Ben-Tzvi	Virginia Tech	Professor	bentzvi@vt.edu
Dr. Bruce Peckham	University of Minnesota, Duluth	Professor Emeritus	bpeckham@d.umn.edu