Yujiong Liu

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Education

Virginia Tech — Blacksburg VA, USA
Ph.D. in Mechanical Engineering, GPA: 4.00/4.00, Advisor: Prof. Pinhas Ben-Tzvi — 2017–2022

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

Harbin Institute of Technology — Harbin, China
M.S. in Mechatronics Engineering, 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

Cornerstone Medical (USA) Inc. — Waltham MA, USA
Robotic System Engineer — August 2022–Present

- Develop robot-assisted minimally invasive surgery devices

Virginia Tech — Blacksburg VA, USA
Graduate Research Assistant and Lab Manager at the Robotics & Mechatronics Lab — August 2017–May 2022

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

University of Minnesota, Duluth — Duluth MN, USA
Graduate Teaching Assistant at the Applied Math Department — August 2015–June 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 — September 2013–July 2015

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

Selected Publications and Patents

[1] **Liu, Y.** and Ben-Tzvi, P., "VT Lemur: A Novel Quadruped Robot with a Serpentine Robotic Tail", *International Journal of Robotics Research*, In Preparation.

[2] **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, pp. 4664-4670

[3] **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

[4] **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

[5] **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

[6] **Liu, Y.**, Kong, M., Wan, N. and Ben-Tzvi, P., 2018, "A Geometric Approach to Obtain the Closed-Form Forward Kinematics of H4 Parallel Robot", *Journal of Mechanisms and Robotics, Transactions of the ASME*, 10(5), p. 0510113

[7] Ben-Tzvi, P., **Liu, Y.**, "Extensible Continuum Manipulator", Patent App. No. 21/34564, PCT/US, Filed 5/27/2021.

[8] Ben-Tzvi, P., Rone, W., Saab, W., **Liu, Y.**, "Articulated Multi-Link Robotic Tail Systems and Methods", Patent No. 11,305,420, UNITED STATES, 2022.

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

- Chinese Government Award for Outstanding Self-Financed Students Abroad, China Scholarship Council — 2022
- 3rd Place Winner 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

Mentorship

- **Graduate Students:** Shikhar Kashyap (now PhD student), Isaac Pressgrove (now PhD student)
- **Undergraduate Students:** Alex Broz (now MS student), Logan Stevenson, One senior design team of 7 students

Skills

- **Mathematics:** Modeling, Mechanics, Dynamics, Control, Optimization
- **System Development:** Mechatronics, Robotics, Prototyping, Manufacturing
- **Technical Writing:** Publication, Proposal, Report
- **Coding:** C/C++, Matlab

Academic Memberships

- American Society of Mechanical Engineers (ASME), Student Member (2019-2022), Member — 2019–present
- Institute of Electrical and Electronics Engineers (IEEE), Student Member (2019-2022), Member — 2019–present

References

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