

EDUCATION

Virginia Tech

Ph.D. in Mechanical Engineering, GPA: 4.00/4.00, Advisor: [Prof. Pinhas Ben-Tzvi](#)

Blacksburg VA, USA

2017–2022

University of Minnesota, Duluth

M.S. in Applied and Computational Mathematics, GPA: 4.00/4.00, Advisor: [Prof. Bruce Peckham](#)

Duluth MN, USA

2015–2017

Harbin Institute of Technology

M.S. in Mechatronics Engineering, GPA: 82.5/100, Advisor: Prof. Minxiu Kong

Harbin, China

2013–2015

Tongji University

B.S. in Mechanical Engineering, GPA: 4.11/5.00

Shanghai, China

2009–2013

EXPERIENCE

Virginia Tech

Graduate Research Assistant and Lab Manager at the [Robotics & Mechatronics Lab](#)

Blacksburg VA, USA

August 2017–May 2022

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

University of Minnesota, Duluth

Graduate Teaching Assistant at the Applied Math Department

Duluth MN, USA

August 2015–June 2017

- Investigated the dynamic behaviors of a singular perturbed quadratic map

Harbin Institute of Technology

Graduate Research Assistant at the State Key Laboratory of Robotics and System

Harbin, China

September 2013–July 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 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
- 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

REFERENCES

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