JINGSHU PENG

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EDUCATION

Xingjian College, Tsinghua University Beijing, China
BEng in Energy and Power Engineering (Aerospace) Sept 2020-June 2025
BS in Theoretical and Applied Mechanics

- **Major GPA:** 3.61/4.0 (87/100)
- **Received a total of 17 awards, including 7 scholarships and 4 Scientific Research and Innovation Competition Awards; Some representative awards include:**
  Outstanding Student Cadre (top 1%, 2024); First Prize in Tsinghua University "Challenge Cup" Scientific Research and Innovation Competition (top 1%, 2023); All-Round Excellence Scholarship (top 10% in both Academic and Research, for 2022-2023 & 2021-2022); Person of the Year of Xingjian College (top 1%, 2022)

PUBLICATIONS & PATENTS

[1] **J. Peng**, Y. Xie, Q. Yang, Y. Jia, W. Huang, G. Xie. *Multi-environment robotic locomotion through integrated median-paired and caudal fin propulsion.* Revise and resubmit at Ocean Engineering.
[2] **J. Peng***, N. M. Alizadeh*, E. Bolívar-Nieto. *Comparative Analysis of Whole-Body Center-of-Mass Estimation Methods in Dynamic and Static Tasks Using Marker-Based Systems*. Revise and resubmit at Journal of Biomechanics.
[3] National Invention Patent - *Amphibious Biomimetic Robot with Dual Propulsion System*. Substantive Examination.

RESEARCH EXPERIENCE

Comparative Analysis of Center of Mass Estimation Methods for Wearable Robot June 2024-Oct 2024
University of Notre Dame (Supervisor: Prof. Edgar Bolívar-Nieto) Notre Dame, IN, USA

- Compared the effectiveness of three methods in estimating whole-body CoM position and velocity during 14 tasks, aiming to identify the most accurate CoM estimation methods for wearable robot
- Conducted tests on 10 subjects using a Motion Capture System to collect body data, processed the data in MATLAB, and conducted statistical analysis. Produced a research paper [2]

An Amphibious Biomimetic Frog Soft Robot Design May 2024-Present
Peking University (Supervisor: Prof. Guangming Xie & Prof. Yongxia Jia) Beijing, China

- Proposed the idea and developed an innovative soft robotic frog with faster swimming speed and impressive land performance, including jumping up to 4 body lengths and executing backflips
- Designed structures in SolidWorks and CAD, fabricated soft robots via 3D printing, simulated experiments with Abaqus, developed control systems using STM32, and analyzed experimental results for a research paper

A Soft Climbing Robot Design with a Layered Manufacturing Approach Jan 2024-June 2024
Peking University (Supervisor: Prof. Guangming Xie) Beijing, China

- Designed the first robot capable of performing climbing tasks on both poles and pipes with seamless switching
- Conducted testing, used Matlab to analyze data, and performed optimization design in SolidWorks and CAD

Amphibious Biomimetic Robot with Combined BCF-MPF Propulsion System Aug 2022-Dec 2023
Tsinghua University (Supervisors: Prof. Yongxia Jia & Prof. Weixi Huang) Beijing, China

- Proposed the idea and developed an amphibious biomimetic robot featuring an innovative combined propulsion system that improved maneuverability, swimming speed, and energy efficiency
- Used STM32 and Arduino for SCM programming, Ansys Fluent for fluid simulations, and SolidWorks for modeling; managed entire process from design to control system development and data processing
- Produced a research paper [1] and a national invention patent [3], and was offered $30,000 in seed funding

Dangerous Pedestrian Model for Autonomous Driving Simulation Scenarios Sept 2021-Apr 2022
Tsinghua University (Supervisor: Prof. Jianqiang Wang) Beijing, China

- Simulated irrational pedestrian actions to verify autonomous vehicle safety on the Carla platform
- Used reinforcement learning to develop the model of dangerous pedestrian behavior

WORK EXPERIENCE

THU POWER (A New Achievement Transformation Institution of Tsinghua University) Beijing, China
Intern, Rocket Engine R&D Department June 2023 – July 2023

- Designed a control system for stamping jet engines; developed an enhanced engine start control system using STM32 and PID control principles

ADDITIONAL INFORMATION

Leadership and Extracurricular Experiences

- Vice President, The 48th Student Union of Tsinghua University (Dec 2023-Dec 2024)
- President, The 1st Student Union of Xingjian College (Sept 2022-Oct 2023)
- Teaching Assistant for Underwater Biomimetic Robot Design Course (June 2023-Sept 2023)

Research Skills: C, Python, Matlab, SolidWorks, CAD, Anays Fluent, Comsol, Abaqus, Arduino, STM32, Photoshop
Language Skills: English (Fluent), Chinese (Native), Portuguese (Basic)