Shiqi Ren

Academic curriculum vitae
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Master's student in Aerospace Vehicle Design
Innovation Academy for Microsatellites, Chinese Academy of Sciences, Shanghai, China
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Education

Joint master's training in Aerospace Vehicle Design Sep 2024 - Jun 2027 (expected)

University of Science and Technology of China and the Chinese Academy of Sciences.
Graduate coursework at USTC in Year 1, followed by research at the Innovation Academy for Microsatellites, CAS, in Years 2-3.

Bachelor's degree in Mechanical Engineering Jun 2020 - Jun 2024

China University of Mining and Technology. Focus on industrial robotics.

Selected manuscripts

01 **MambaPose: A Parameter-Efficient Selective State-Space Backbone for Keypoint-Based Monocular Spacecraft Pose Estimation**
Shiqi Ren and Pengcheng Wang · Manuscript, 2026
Single-image keypoint prediction and geometric pose recovery, evaluated under changes in illumination.

02 **Recoverability-shielded reinforcement learning for far-range spacecraft rendezvous**
Research manuscript, 2026
Burn timing and braking checks during a simulated approach from 10 km to a 100 m handover.

03 **Local CBF-QP Projection Credit Assignment for Reinforcement Learning in Terminal-Phase Spacecraft Rendezvous and Docking**
Shiqi Ren and Pengcheng Wang · Author preprint, 2026
The geometry of a safety filter's corrections provides a training signal for a docking policy.

04 **Actuator-Preimage Braking Certificates for Terminal Spacecraft Approach**
Shiqi Ren and Pengcheng Wang · Manuscript, 2026
Command limits preserve a braking margin under the assumed actuator dynamics and uncertainty bounds.

Robotics research

Coordinated motion in tendon-driven arms
I model the coupling between tendon tension and joint motion in a six-section, twelve-degree-of-freedom arm. A separate simulation study examines control reallocation after a single tendon loses effectiveness.

Methods and tools

Spacecraft guidance and relative motion, reinforcement learning, keypoint-based pose estimation, mechanical design and tendon-driven dynamics. Software tools include Python, C++, and ROS.