

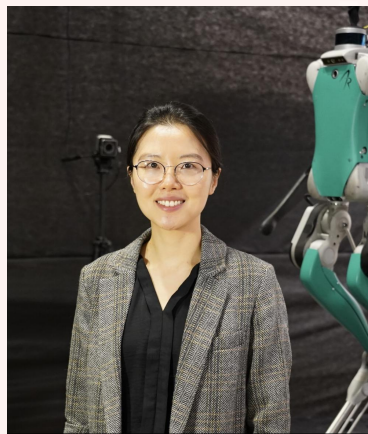
学术报告会

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Modeling, Estimation, and Control of Robot Locomotion in Non-inertial Environments

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摘要:

Legged robots have the potential to assist humans with a wide range of real-world tasks in dynamic, unstructured environments. While legged robot operation in inertial environments has been extensively studied, legged locomotion in non-inertial settings (e.g., ships and oil platforms) remains a new robot functionality that has not been solved. This new functionality will empower legged robots to perform critical, high-risk tasks such as shipboard maintenance, inspection, firefighting, and fire suppression as well as surveillance and disinfection on moving public transportation vehicles. Yet, enabling reliable locomotion in a non-inertial environment presents substantial fundamental challenges in robot control due to the high complexity of the hybrid, time-varying physical interaction between the robot and the environment. Dr. Gu will present the current progress from her research group in creating new approaches of robot modeling, state estimation, and control that achieve provably robust quadrupedal and humanoid locomotion in non-inertial environments.

简介:

Yan Gu received the B.S. degree from Zhejiang University, China, in 2011 and the Ph.D. degree from Purdue University in 2017, both in Mechanical Engineering. She joined the School of Mechanical Engineering at Purdue University as an Associate Professor in Fall 2022. Prior to joining Purdue, she was an Assistant Professor in the Department of Mechanical Engineering at the University of Massachusetts Lowell. Her research focuses on modeling, state estimation, planning, and control of legged locomotion and manipulation in highly dynamic and complex environments including non-inertial settings. Her research draws on nonlinear control theory, theory of hybrid systems, dynamics, and optimization to advance robot modeling, state estimation, and control. Dr. Gu is an Associate Editor for the IEEE/ASME Transactions on Mechatronics and IEEE Robotics and Automation Letters, as well as a Guest Editor for the IEEE Transactions on Robotics. She received the Young Investigator Program Award from the Office of Naval Research in 2023, the Faculty Early Career Development Program (CAREER) Award from the National Science Foundation in 2021, and Verizon's 5G Robotics Challenge Award in 2019.