Feitian Zhang, PhD

Assistant Professor, Department of Electrical and Computer Engineering

Education

PhD, Electrical and Computer Engineering, Michigan State University

Key Interests

Robotics | Control Systems | Autonomous Systems | Underwater Vehicles | Aerial Vehicles | Bio-inspired Robotics | Mechatronics | Artificial Intelligence | Environmental Monitoring

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SELECT PUBLICATIONS

- G. Cook and F. Zhang. Mobile robots: navigation, control and sensing, surface robots and AUVs. *Wiley-IEEE Press* (2020).
- F. Dang and F. Zhang. Distributed flow estimation for autonomous underwater robots using POD-based model reduction. *Journal of Dynamic Systems, Measurement, and Control, Special Issue on Unmanned Mobile Systems* 141.7, 071010 (2019).
- F. Zhang *et al.*, Autonomous sampling of water columns using gliding robotic fish: control algorithms and harmful algae-sampling experiments. *IEEE Systems Journal, Special Issue on Cyber-innovated Environmental Sensing, Monitoring and Modeling for Sustainability* 10(3), 1271-1281 (2016).

Research Focus

My research areas include bio-inspired robotics, control systems, unmanned underwater and aerial vehicles, mechatronics, and artificial intelligence. As the founding director of the Bio-inspired Robotics and Intelligent Control Laboratory (BRICLab) at George Mason University, my research group aims to design and develop advanced autonomous systems using novel sensors, actuators, and control and estimation algorithms, in order to solve real-world problems such as aquatic environmental monitoring, subsea infrastructure fault detection, and cooperative surveillance/defense using a swarm of robotic agents.

Current Projects

- The flow sensing project aims to apply reduced-order modeling, fluid mechanics, and estimation theory to create a systematic background flow estimation approach for autonomous underwater vehicles to navigate through unknown and dynamic environments.
- The heterogeneous lighter-than-air vehicle project aims to apply engineering dynamics, control and estimation theory, sensors and actuators, and artificial intelligence to develop smart robotic blimps that interact with each other for studying emerging swarm behaviors.
- The learning and control project aims to apply control theory, engineering dynamics and machine learning (in particular deep reinforcement learning) to develop a real-time learning and control approach for autonomous dynamical systems with a focus on bioinspired and biomimetic robots.