

Department Seminar

Wednesday, October 8, 2025

11:00am – 12:pm PT

SME 248



Dr. Ritu Raman, PhD

*“Neuromuscular Tissue Engineering for
Regenerative Medicine and Biohybrid Robotics”*

Eugene Bell Career Development Professor of Tissue
Engineering

Assistant Professor of Mechanical Engineering
Massachusetts Institute of Technology

Abstract: All voluntary movement in humans and many other biological creatures is powered by skeletal muscle and controlled by motor neurons. The neuromuscular system is remarkable for its ability to efficiently generate large forces while adapting form and function to changing environmental stimuli. The Raman Lab leverages tissue engineered models of the neuromuscular system to understand and treat diseases that limit human mobility, and to power robots that dynamically sense and adapt to their environments. This talk will discuss our work in: 1) Developing tools to manipulate forces within neuromuscular tissues, thus advancing fundamental understanding of how mechanical stimuli during exercise mediate adaptation and remodeling; 2) Creating predictive design frameworks and fabrication methodologies to deploy robust muscle-actuated machines that leverage the adaptability and sustainability of living tissues.

Bio: Ritu Raman, PhD is the Eugene Bell Career Development Assistant Professor of Mechanical Engineering at MIT. Her lab is centered on 4D tissue engineering of biological actuators for applications in regenerative medicine and biohybrid robotics. Ritu's research has received several recognitions including the PECASE, the NSF CAREER Award, the Army Research Office YIP Award, and the Office of Naval Research YIP Award, as well as Rising Star Junior Faculty Awards from the Biomedical Engineering Society and the American Society of Mechanical Engineers. She has also been named a NAE Grainger Frontiers of Engineering Fellow and NAS Kavli Frontiers of Science Fellow. Ritu is the recipient of the Spira Award for Excellence in Teaching at MIT and the author of the MIT Press book Biofabrication.

Seminar Host: Zeinab Jahed