

## **Bio-Inspired Robotics: Advancements in Agility, Assistive Technologies, and Human-Robot Interaction**

**Abstract:** This presentation will explore cutting-edge advancements in robotics and intelligent systems, with a focus on bio-inspired designs that enhance agility and human-robot interaction. The talk will highlight innovative applications in robotic exoskeletons for upper-extremity rehabilitation and bio-inspired robotic tails that improve the agility of legged robots. These developments utilize artificial intelligence, advanced sensing, and control systems to optimize performance, creating significant breakthroughs in healthcare, assistive technologies, and defense. The talk will also examine how intelligent autonomous systems can integrate seamlessly with human environments, driving forward the future of robotics in healthcare and human-machine interaction.

**Biography:** Dr. Pinhas Ben-Tzvi is a Professor of Mechanical Engineering and Electrical & Computer Engineering at Virginia Tech, where he founded the Robotics and Mechatronics Laboratory. His expertise spans cyber-physical systems, AI and machine learning, robotics, intelligent autonomous systems, healthcare technologies, human-machine systems, multi-robot systems, novel sensing and actuation, and mechatronics design. His research has been supported by multiple government agencies, including NSF, NIH, DARPA, ONR, the U.S. Navy, and the U.S. Army Medical Research & Materiel Command (USAMRMC). Dr. Ben-Tzvi has authored over 180 peer-reviewed publications and holds 13 U.S. patents. His contributions have been recognized with numerous teaching, research, and professional service excellence awards. He has played key roles in spearheading curriculum development and STEM outreach initiatives, strengthening engineering education and research infrastructure. He actively serves on journal editorial boards and conference committees as an Editor and Associate Editor. Dr. Ben-Tzvi is a Fellow of ASME and a Senior Member of IEEE.