NJIT New Jersey Institute of Technology

BME

Department of Biomedical Engineering

Graduate Seminar

Dr. Jacqueline Libby

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Langone Health
New York University

Feb 1 (Wed)
2:30pm - 4:00pm
FENS 698

Soft, Smart Physical Human-Robot Interaction in the Medical Domain

Abstract:

I will first review my dissertation research in robotic perception systems for offroad mobile vehicles. This involved self-supervised machine learning for multiclass terrain classification using a combination of sound and vibration data and color camera imagery. I will then discuss my current postdoctoral work in rehabilitation robotics, which involves two areas of focus. The first is machine learning on high-density surface electromyography (HD-sEMG) for the classification of over 60 human hand and arm gestures. The goal of this work is to predict a user's gesture to control upper-limb exoskeletons, exosuits, and prosthetic arms, enabling patients with motor impairments and amputees to regain upper-limb function. The second area is in the mechanical design and fabrication of soft actuators for future use in upper limb soft exosuits. I will discuss the novel soft actuators I have developed for joints in the upper limb, including the fingers, wrist, and elbow. I will discuss the design and fabrication pipeline I have developed, including CAD design, finite element modeling, 3d printing, casting, multipart fabrication, pneumatic actuation, and static and dynamic experimental analysis.The goal of this work is to actuate exosuits and other soft rehabilitation devices to allow for safe physical Human-Robot Interaction.

About the Speaker

Dr. Jacqueline Libby is a Postdoctoral Associate at New York University's Tandon School of Engineering and NYU Langone Health. She has been awarded a two-year postdoctoral fellowship from NYU's Center for Urban Science and Progress. Dr. Libby has an interdisciplinary background, with expertise in Computer Science, Mechanical Engineering, Robotics, and Rehabilitation Engineering. She received her B.Sc. from Brown University in Computer Science and her M.Sc. from Carnegie Mellon University in Mechanical Engineering to expand her knowledge in Robotics. She earned her Ph.D. from Carnegie Mellon's Robotics Institute. Her research aims to develop innovative solutions to improve the quality of life for individuals with motor impairments and amputees by using machine learning, soft robotics, and neural interfacing.