

Mechanical Engineering Seminar Series

November 13, 2024, 11:00AM

Dean's Conference Room, E-203E

**Title: Experimental Decentralized Adaptive Control and Delay
Compensation for a High-DOF Robotic System**

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Abstract: Dr. Naseradinmousavi presents two efforts for analytical and experimental control of a seven-degrees-of-freedom (7DOF) robot manipulator. First, a model-free decentralized adaptive control strategy is discussed for the tracking control of the manipulator. The problem formulation and experimental results demonstrate the computational efficiency and simplicity of the proposed method. The results presented here are one of the first known experiments on a redundant 7DOF robot. The efficacy of the adaptive decentralized controller is demonstrated experimentally by using the Baxter robot to track a desired trajectory. Also, another theoretical and experimental aspect of robotic research work is presented for a challenging problem of invariant actuation delay control for the robot. Tackling this aspect is crucial for applications like control of Mars Rover whereas inevitable delay, either actuation or communication one, could destabilize the robot operation.

Brief Bio: Before joining San Diego State University, Dr. Peiman Naseradinmousavi was a Visiting Assistant Professor of Purdue University. He received his Ph.D and B.Sc. degrees in mechanical engineering (dynamics and control) from Villanova and Tabriz universities, in 2012 and 2002, respectively. His research interests include Smart Flow Distribution Network, Robotics, Nonlinear Dynamics, Control Theory, Optimization, Magnetic Bearings, and Mathematical Modeling.