USC Viterbi
School of Engineering

Mechanical Engineering: Ph.D. Dissertation Topics

2021 Dissertation Titles

- Model based design of porous and patterned surfaces for passive turbulence control, Principal Investigator (P.I): Mitul Luhar, Assistant Professor
- A New Approach to the Control of Non-Minimum Phase Systems Through Parallel Feedforward Compensation, P.I: Bingen Yang, Professor

2020 Dissertation Titles

- Development and Control of Biologically-Inspired Robots Driven by Artificial Muscles, P.I: Nestor Perez-Arancibia, Assistant Professor
- Development of Biologically-Inspired Sub-Gram Insect-Scale Autonomous Robots, P.I: Nstor Prez-Arancibia, Assistant Professor
- Direct Numerical Simulation of Mixing and Combustion under Canonical Shock Turbulence Interaction, P.I: Ivan Bermejo-Moreno, Assistant Professor
- Understanding the formation and evolution of boundaries and interfaces in nanostructured metallic alloys, P.I: Andrea Hodge, Professor
- Novel Soft and Micro Transducers for Creating Biologically-Inspired Robots, P.I: Nestor Perez-Arancibia, Assistant Professor
- Sound transmission through acoustic metamaterials and prepreg processing science, P.I: Steven Nutt, Professor
- A Social-Cognitive Approach to Modeling Design Thinking Styles, P.I: Yan Jin, Professor

2019 Dissertation Titles

- Novel Soft and Micro Transducers for Creating Biologically-Inspired Robots, P.I: Nestor Perez-Arancibia, Assistant Professor
- Understanding the formation and evolution of boundaries and interfaces in nanostructured metallic alloys, P.I: Andrea Hodge, Professor
- Direct Numerical Simulation of Mixing and Combustion under Canonical Shock Turbulence Interaction, P.I: Ivan Bermejo-Moreno, Assistant Professor
- Development and Control of Biologically-Inspired Robots Driven by Artificial Muscles, P.I: Nestor Perez-Arancibia, Assistant Professor
- Development of Biologically-Inspired Sub-Gram Insect-Scale Autonomous Robots, P.I: Nestor Perez-Arancibia, Assistant Professor
- Trajectory Planning for Manipulators Performing Complex Tasks, P.I: Satyandra Gupta, Professor
- Speeding Up Trajectory Planning for Autonomous Robots Operating in Complex Environments, P.I: Satyandra Gupta, Professor
- Investigations of Fuel and Hydrodynamic Effects in Highly Turbulent Premixed Jet Flames, P.I: Fokion Egolfopolous, Professor
- Flame Characteristics in Quasi-2D Channels: Stability, Rates and Scaling, P.I: Paul Ronney, Professor
- Contingency Handling In Mission Planning for Multi-robot Teams, P.I: Satyandra K. Gupta, Professor
- Synthesis and Analysis of High-Performance Controllers for High-Speed Autonomous Aerobatic Flight, P.I: Nestor Perez-Arancibia, AssistantProfessor

2018 Dissertation Titles

- Transfer reinforcement learning for autonomous collision avoidance, P.I: Yan Jin, Professor
- Modeling and Dynamic Analysis of Coupled Structure-Moving Subsystems Problem, P.I: Bingen Yang, Professor
- Mesoscale SOFC-Based Power Generator System: Modeling and Experiments, P.I: Paul Ronney, Professor
- Form Finding and Shape Control of Space Deployable Truss Structures, P.I: Bingen Yang, Professor
- Dynamics of Direct Hydrocarbon Polymer Electrolyte Membrane Fuel Cells, P.I: Paul Ronney, Professor
- Cfd Design of Jet-Stirred Chambers for Turbulent Flame and Chemical Kinetics Experiments, P.I: Paul Ronney, Professor
- In Situ Process Analysis for Defect Control During Composites Manufacturing, P.I: Steven Nutt, Professor
- Feature and Model Based Biomedical System Characterization of Cancer, P.I: Paul Newton, Professor
- Passive Flight in Density-Stratified Fluid Environments, P.I: Eva Kanso, Professor

2017 Dissertation Titles

- Managing Functional Coupling Sequences to Reduce Complexity and Increase Modularity in Conceptual Design, P.I: Stephen Lu, Professor
- Accuracy and feasibility of combustion studies under engine relevant conditions, P.I: Fokion Egolfopoulos, Professor
- Using Nonlinear Feedback Control to Model Human Landing Mechanics, P.I: Henryk Flashner, Professor
- Pressure effects on C1-C2 hydrocarbon laminar flames, P.I: Fokion Egolfopoulos, Professor
- Development of Composite Oriented Strand Board and Structures, P.I: Steven Nutt, Professor
- Experimental Studies of High-Pressure Combustion Using Spherically Expanding Flames, P.I: Fokion Egolfopoulos, Professor
- Investigations of Fuel Effects on Turbulent Premixed Jet Flames, P.I: Fokion Egolfopoulos, Professor
- An Experimental Study of the Elastic Theory of Granular Flows, P.I: Charles Campbell, Professor
- Development and Characterization of Hierarchical Cellular Structures, P.I: Andrea Hodge, Professor
- Computational Tumor Ecology: a Model of Tumor Evolution, Heterogeneity, and Chemotherapeutic Response, P.I: Paul Newton, Professor