

The Department of Mechanical Engineering  
College of Engineering and Applied Sciences  
Stony Brook University  
**Mechanical Engineering Seminar**



**Onur Bilgen, Assistant Professor**  
**Department of Mechanical and Aerospace Engineering, Rutgers University**

**Lecture Title: Applications of Smart Materials in Robotic, Aerospace and Energy Conversion Systems**

Friday, December 8, 2017 at 2 PM, Room 173 Light Engineering Building

**Abstract**

Shape adaptation is a trait that some smart-materials naturally exhibit; hence, such materials may offer system-level benefits as actuators, sensors and energy harvesters while simultaneously improving reliability of a system by reducing the part count and mechanical complexity. This presentation will review recent progress made towards enabling various “solid-state” designs in conventionally complex robotic, aerospace and energy-conversion systems. Particular emphasis will be on research in shape morphing of aerodynamic surfaces, including camber and thickness control, leading to the flight demonstration of two small-unmanned aircraft.

**Biography**

Dr. Onur Bilgen is a tenure-track faculty at the Mechanical and Aerospace Engineering Department of Rutgers University in New Jersey. Dr. Bilgen received his B.S., M.S. and Ph.D. degrees in Mechanical Engineering from Virginia Tech in 2005, 2007 and 2010 respectively. Onur held a two-year (post-doctoral) research officer position at Swansea University in United Kingdom. His research to date in the field of adaptive/active structures, composites and small UAS incorporating smart-materials has led to two book chapters, 32 peer-reviewed journal articles and 62 conference papers, including the ASME / BOEING Best Paper Award at the AIAA SDM 2007 conference. He serves as a principal and co-principal investigator in several U.S. Government funded grants. A recent award from NASA, as a part of a new NASA Center funded by the University Leadership Initiative (ULI) program, will enable him develop a piezocomposite trailing edge for ultra-efficient commercial vehicles in the 100-210-passenger class. Dr. Bilgen is interested in conceptual design, modeling/simulation, optimization, control, manufacturing and testing/validation of smart-material based multi-physics systems.

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