



ME Seminar



Compliant Design and Applications to Shape-adaptive Surfaces

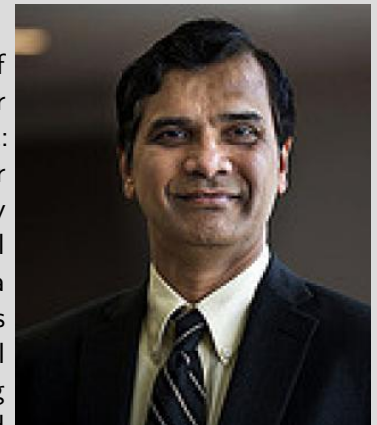
Sridhar Kota, Mechanical Engineering, University of Michigan, Ann Arbor

ABSTRACT

This talk will provide an overview of design of compliant mechanisms by exploiting the inherent elasticity of materials, and its applications to everyday products. Compliant design offers structural flexibility, as in shape morphing, without compromising strength. One such application featured in this talk is the design and implementation of shape-adaptive surfaces for aerodynamic applications. Although morphing aircraft wings has been an elusive goal for decades, it is the application of compliant design method that led to practical design of shape-adaptive control surfaces on full-scale aircraft wings demonstrating fuel savings and noise reduction. Applications of compliant design including shape morphing applications were developed at FlexSys Inc. Between 2014 and 2017, Air Force Research Labs in collaboration with NASA Armstrong has conducted numerous flight tests of a Gulfstream GIII business jet retrofitted with FlexSys' FlexFoil[®] control surfaces demonstrating the world's first modern aircraft with seamless control surfaces without conventional hinge-jointed flaps.

ABOUT THE SPEAKER

Sridhar Kota is Herrick Emeritus Professor of Engineering, Emeritus Professor of Mechanical Engineering (1987-2021) at the University of Michigan, the Founder and CEO of FlexSys Inc., and the founding Executive Director of MForesight: Alliance for Manufacturing Foresight. Kota served as the Assistant Director for Advanced Manufacturing at the White House Office of Science and Technology Policy (2009-12) where he played an instrumental role in establishing National Manufacturing Innovation Institutes, and the National Robotics Initiative. Kota authored over 250 technical papers, 40 patents on bio-inspired engineering systems and soft robotics. He is the recipient of the American Society of Mechanical Engineers (ASME) Machine Design Award, Leonardo da Vinci Award, Outstanding Educator Award and the University of Michigan Regents' award for Distinguished Public Service and the Distinguished University Innovator Award.



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