



College of Engineering
Department of
Mechanical & Industrial Engineering

The Sidney E. Fuchs Seminar Series

3:30-4:20pm, Friday, February 15, 2013

Frank Walk Room



Structural Control of Floating Wind Turbines

by **Mario Rotea, Ph.D.***

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Abstract. The Department of Energy (DOE) strategy for offshore wind calls for the nation to deploy 54 gigawatts (GW) of offshore wind generating capacity by 2030, at a levelized cost of energy of \$0.07 per kilowatt-hour (kWh) [DOE, 2011]. This target will be achieved through innovation in many areas, but necessarily by making wind turbines smarter with a new generation of control systems. This presentation will review recent work on structural control systems to improve the reliability of large-scale offshore floating wind turbines.

Reference: M. A. Lackner and M. A. Rotea, "Structural Control of Floating Wind Turbines," *Mechatronics*, Vol. 21, No. 4, Special Issue on past, present and future modeling and control of wind turbines, pp. 704-719, 2011.

* Mario A. Rotea graduated with a degree in electronic engineering from the University of Rosario in 1983. He received the master's degree in electrical engineering in 1988 and the Ph.D. in control science and dynamical systems in 1990 from the University of Minnesota. He is currently the Erik Jonsson chair and head of the Mechanical Engineering Department at the University of Texas at Dallas, where he is also an affiliate professor of electrical engineering. He began his academic career at Purdue University, West Lafayette, where he was a professor of aeronautics and astronautics for seventeen years. He was a professor and head of the Mechanical and Industrial Engineering Department from 2007 to 2009 at the University of Massachusetts, Amherst. He managed the Control Systems program at the NSF from 2005 to 2007 and worked for the United Technologies Research Center in 1997-1998. Dr. Rotea has made pioneering contributions in optimal and robust control systems. He has developed and transitioned to industry control systems to mitigate noise and vibrations in gas turbine engines, helicopters, and machine tools. He is a recipient of the NSF 1993 Young Investigator Award and a Fellow of the IEEE. His current research interests are in the control of energy systems.