

Civil & Environmental Engineering Distinguished Seminar Series

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Bad Wind and Good Wind: From Frightful Structural Threat to Valuable Energy Source

This talk will introduce you both negative side and positive side of natural winds. Strong winds including hurricanes, thunderstorms, tornadoes, etc have given us large amount of losses due to structural failures. Total losses in USA caused by natural disasters from 2001 to 2010 are more than \$350 billion in 2010 dollars. To make more safe structures against winds, the state-of-the-art for currently proven technologies for wind resistant design will be presented focusing on long span cables stayed bridges. Videos for wind tunnel tests of several bridges will be also presented. Winds, on the other hand, are sometimes useful for our life. Mild wind may provide us useful electric energy in addition to positive effects on urban atmospheric environments. The contribution of civil engineering on development of large wind farm will be discussed in this talk. Moreover a methodology of using small wind turbines for dual purposes, improving the aerodynamic performance of flexible bridge girders and wind energy harvesting will be addressed. Finally micro wind energy harvesting from flow-induced instability will be introduced to provide power to a wireless sensor network for structural health monitoring cost effectively.



Professor Soon-Duck Kwon is the founding director of the KOCED Wind Tunnel Center at Chonju National University that is supported by Ministry of Land, Transport and Maritime Affairs of Korea. He has over 17 years of experience at academics and government agency. His research has focused on wind engineering, structural dynamics, vibration control and energy harvesting. He has published more than 60 scientific papers in peer reviewed domestic and international journals. He received both his civil engineering degree and Ph.D. in structural engineering from the Seoul National University in 1986, Korea. He is currently on an academic sabbatical leave at Stanford University.

**Tuesday, November 8, 2011
1:45PM-2:45PM
103 Churchill Hall**