

SFSU School of Engineering Seminar

“Strange Sound Emitted from a Bridge Cable and New Method to Identify Both Tension and Bending Rigidity of a Bridge Cable”

Hideo Utsuno, Ph.D.

Department of Mechanical Engineering and Science,
Kyoto University, Kyoto, Japan



Wednesday, March 16

1:10 - 2 pm

SCI 256

Synopsis: *In the first topic, flexural wave propagation along the long cable is discussed. The governing equation of this phenomenon is the equation of motion for the beam which is taught in the second year of a university. Soliton of flexural wave occurs when the long cable collides to each other. After propagation over long distance, it becomes continuous sinusoidal wave which changes its periodic time from high frequency to low frequency. This phenomenon shows that the propagation speed of a bending wave is a function of frequency. The second topic is on how to estimate the cable tension from vibration tests. Cable tension is a very important parameter for the design and maintenance of the bridge. Consider the equation of motion for the beam in tension. Tension and bending rigidity are the coefficients for the partial differential equation of the motion. These two unknown coefficients can be determined theoretically from measuring several resonance frequencies.*

Speaker Bio: Professor Utsuno received his B.S. from the Department of Aeronautics at Nagoya University in 1980, his M.S. and Ph.D. from the Department of Aeronautics at Tokyo University in 1982 and 1994, respectively. He was employed in the Mechanical Engineering Research Laboratory at Kobe Steel, Ltd beginning in 1982. Since 2003, he has been employed as an Associate Professor at Kyoto University in the Department of Mechanical Engineering and Science.

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For inquiries, please contact Dr. Kwok Siong Teh at ksteh@sfsu.edu.