

# **Department of Ocean and Resources Engineering**

*Seminar*

## **Displacement and Pressure Transfer between Structure and Fluid Meshes in Fluid-Structure Interaction**

by

**Linda Huang**

Dept. of Civil & Environmental Engineering  
University of Hawaii at Manoa

Wednesday, April 2, 2003 3:30 PM Holmes 211
---

### **Abstract**

Nonlinear, time-domain hydroelastic analysis of offshore structures can be described as a two-field problem. One can adopt either "closely-coupled" strategy that involves a single model for both the fluid and structure, or a "loosely-coupled" strategy, in which separate models are used. In the latter approach, the structural motion must be transferred to the fluid model and the resulting fluid pressure at the fluid-structure interface must be transmitted from the fluid model to the structure. The transfer of displacement and pressure is both difficult and non-unique when the structural mesh and the fluid mesh describe two distinct three-dimensional surfaces. A new transfer strategy based on the variational-based smoothing element analysis (SEA) technique will be presented. For energy conservation during the pressure transfer, three different modifications to SEA will be discussed. Examples of the application of the method to floating structures will be presented and discussed.