Weekly Seminar: Fall 2010

Date: Friday November 19

Time: 11:00 AM

Location: Maryland Hall 110

Speaker: Sung-Eun Kim (NSWC Carderock)

Title:"Working with an Open Source CFD Software – Is it a Worthy Effort?"

Abstract

CFD nowadays is frequently called upon to tackle complex multi-physics and multi-disciplinary applications. The general-purpose CFD codes, in attempts to cater to these diverse needs, have become increasingly larger and more complex. Software complexity is a serious issue which many legacy CFD codes face today, negatively impacting their overall efficacy in terms of quality assurance, packaging, maintenance and extensions. We believe that modern software engineering practices realized by OOP in C++ will greatly facilitate collaborative development, quality assurance, deployment, maintenance, and extension of general-purpose CFD software.

The talk is concerned with a computational fluid dynamics framework under development at the NSWCCD aimed at ship hydrodynamics as target applications. The framework has been built around OpenFOAM (Weller et al., 1998), an open-source CFD software tool-kit written in C++ that draws heavily upon object-oriented programming (OOP). The benefits of OOP embodied in OpenFOAM will be discussed with some examples. The speaker will give an overview of efforts in such areas as numerics, turbulence, cavitation, free-surface flows and fluid-structure interaction.