ORE SEMINAR

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IN THE SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY AT THE UNIVERSITY OF HAWAI'I AT MĀNOA

Optimal Glider Sample Strategies for Uncertainty Reduction

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OASIS Inc.

MSB 114

01/24/2013

4:30-5:45 pm Seminar

Abstract

Ocean models are capable of forecasting conditions out to reasonable periods of time (days) provided initial and ongoing conditions can be measured. With limited assets, the intelligent placement of these measurements is critical. In many ocean environments, sonar performance is critically sensitive to the ocean features and accurate ocean forecasting for ASW planning and prediction is required. In this paper, ocean model forecast uncertainty and ocean acoustic propagation uncertainty are combined to generate cost functions to define an optimal search for glider path planning. The glider sampling optimization problem is posed as a constrained (glider speeds, operational depths, water space management issues) non-linear optimization problem and is solved by a Genetic Algorithm approach. Constituent cost functions including ensemble forecast uncertainty, spatial and temporal dynamic oceanography and ASW sensitivity are combined to form a weighted cost function. The technical approach will be described as well as its application to various experiments off the coasts of Taiwan, Hawaii, New Jersey and Italy.

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