

Conformal Hull Search Using the Harbor Defense CetusII AUV

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Abstract: The employment of high resolution sensors supporting the inspection of ship's hulls requires an AUV to navigate in and around the hull of a ship or restricted berthing zone while maintaining a constant viewing aspect. This paper discusses the implementation of the highly maneuverable CetusII equipped with a unique upward looking sonar, three-point inverse stand-off altimetry, high-frequency long-baseline navigation and doppler inertial guidance to support this mission. It describes the unique approach to hull following using a 3 upward looking sonar altimeters as well as the employment of a high-resolution fiber-optic gyroscope in heading maintenance near the large iron mass which comprises the ship's hull. Adaptation of the vehicle control software to the unique aspects of hull inspection will be discussed as well as results from in-water ship hull inspection testing.