

IAF SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Tools and Technology in Support of Integrated Applications (1)

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USE OF SATELLITE IMAGERY FOR THE CONSTRUCTION OF 3D ENVIRONMENTS APPLIED
TO MARITIME NAVIGATION SIMULATORS**Abstract**

This paper introduces the use of satellite images as an evolution to the three-dimensional representation of spaces or environments required for the development of maritime navigation simulators, which allow training in navigation of vessels according to the desired application. The proposal and the results presented are framed within what is known as an approximation to the real behavior of vessels within a specific environment where a dynamic system is configured in which situations or environments are altered, thus minimizing the risks and damages that could occur in real situations. For its development, the use of satellite images for the creation of virtual environments was especially important, thus preparing the environment for 3D reconstruction through the capture, calibration and rectification of such images, which allowed the three-dimensional construction and visualization of the model and environment to be represented and simulated. Likewise, once the 3D models were obtained, the characteristics and behaviors of the environment and the vessel were programmed, as well as the agents that are present in the interaction between both. The corresponding tests of the simulator were carried out in presentations, symposiums and exhibitions; in these, positive reactions were observed in the interaction of the public with the virtual navigation. For this reason, the three-dimensional modeling of the environment is extremely important, because this allows the user to visualize and perceive the real conditions, as well as to perform complex maneuvers, reducing risks and human errors during navigation.

Keywords: Maritime navigation simulator, satellite images, 3D modeling, environments, environments, training