

Construcción de Foto-Mosaicos en el Contexto de la Robótica Submarina



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HORA	18:15
PROMUEVE	Programa Master en Sistemas Inteligentes

RESUMEN

Part-1 Seafloor mapping using optical sensors

Photo-mosaicing techniques can be used to map areas of some hundreds of square meters, while having enough resolution to allow the identification of specific biologically interesting areas at small scales (few centimeters) down to living organisms. Automatic mosaicing tools improve survey efficiency reducing the cost/time of acquiring and post-processing data. They also provide a permanent visual record of the studied areas. In this talk we will present ongoing work at the University of Girona towards development and application of vision-based seafloor survey methodologies will be described, including large area 2D mosaicing (>1sqkm), monocular-based 3D mosaicing, and stereo seafloor modeling.

Part-2 How to build underwater photomosaics

This second talk will get into the details of how to build large photomosaics of the ocean floor with bounded error. First, we will analyze some of the challenges of using optical imaging in the underwater environment, both for shallow and deep water, and we will see some techniques to overcome them. Light attenuation, suspended particles (producing light scattering), strong parallax and frequent moving elements are typical artifacts in underwater imagery. Next, a complete processing pipeline for mosaicing will be presented, including robust image registration, loop detection, global alignment and mosaic rendering.

Short CV

Dr. Rafael Garcia received the engineering degree in computer science in 1994 from the Autonomia University of Barcelona (UAB) in Spain, and the Ph.D. degree in computer engineering in 2001 from the University of Girona (UdG), Spain. His research activity is mainly focused on underwater robotics in topics such as large-scale seafloor mosaicing, sensor fusion, 3D reconstruction, semantic representation of video imagery, robot navigation and mapping. Currently, Dr. Garcia is the head of the Underwater Vision Lab of the University of Girona, where he holds a position as associate professor. He is involved in several national and transnational projects in the field of underwater robotics and some technology transference projects in visual inspection for quality control purposes. Dr. Garcia is author of more than 90 articles in peer-review journals and scientific conferences.