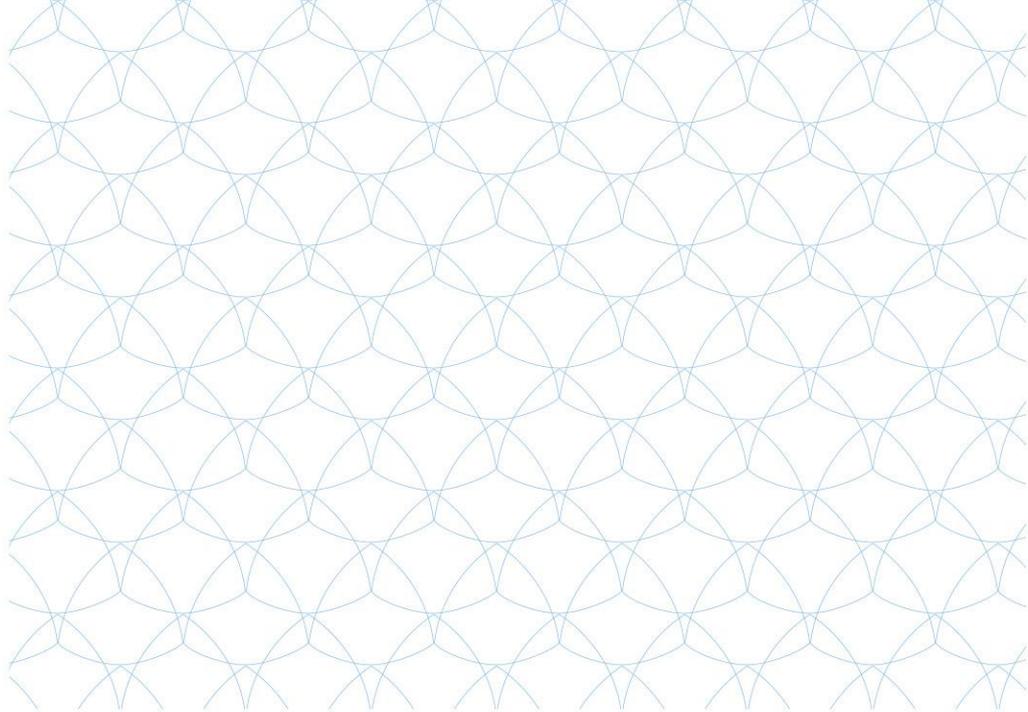




EXCELLABUST
EXCELLING LABUST IN MARINE ROBOTICS

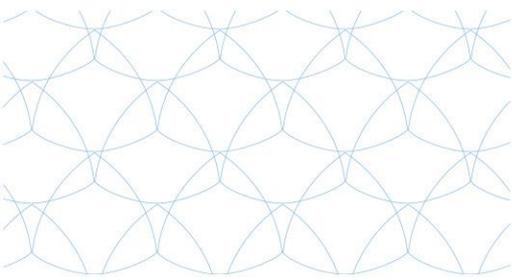


INVITED TALK

20th January 2016

Girona Underwater Vision and
Robotics lab: AUVs for inspection and
intervention

Assoc. Prof. Dr. Marc Carreras
University of Girona



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1. INVITED TALK DETAILS

Date: 20th January 2016
Time: 15:00 – 16:00
Location: Gray Hall, University of Zagreb Faculty of Electrical Engineering (UNIZG-FER)
Unska 3, Zagreb, Croatia

Title: Girona Underwater Vision and Robotics lab: AUVs for inspection and intervention
Name: Assoc. Prof. Dr. Marc Carreras
Affiliation: Computer Vision and Robotics Research Institute, University of Girona
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2. ABSTRACT

[Girona Underwater Vision and Robotics](#) research lab has a strong experience in the design and development of hovering AUV prototypes for different applications going from inspection to intervention. Several AUV prototypes have been designed during the last 10 years, all of them having a different conceptual design, and being [GIRONA 500 AUV](#) and [SPARUS II AUV](#) the currently operative platforms. The talk will summarise the research activities of the lab in AUV capabilities for inspection and intervention. Real-time sensor processing is used for mapping, target identification and motion planning, allowing a close inspection of the underwater structures. Hovering AUVs equipped with a manipulator are able to recover a target, turn a valve or plug a connector from different configurations and using different techniques. A review of the work done will be given pointing out future steps for making these new AUVs capabilities, available for scientific or industrial applications.

3. BIOGRAPHIES OF LECTURERS



Assoc. Prof. Dr. Marc Carreras

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Marc Carreras (MSc 1998, PhD 2003) is Associate Professor in the Computer Engineering Department at UdG, and member of the VICOROB group working in the CIRS laboratory. He holds a B.S. degree in Industrial Engineering (1998) and PhD in Computer Engineering (2003, Best PhD award) from the University of Girona. Since 1999, he has participated in 14 research projects (6 European and 8 National), he is author of more than 80 publications, and he has directed 3 PhDs thesis (3 more under direction). His research activity is mainly focused on underwater robotics in research topics such as intelligent control architectures, robot learning, path planning, AUV design, modelling and identification.

4. DESCRIPTION OF THE PARTNER INSTITUTION:

Universitat de Girona
**Institut de Recerca en Visió
per Computador i Robòtica**

**Computer Vision and Robotics Research Institute,
University of Girona**

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The University of Girona is a public institution devoted to excellence in teaching and research and to participating in the progress and development of society through the creation, transmission, diffusion and criticism of knowledge related to sciences, technology, humanities, social sciences and arts. The Computer Vision and Robotics Research Institute (VICOROB) at the University of Girona is devoted to the research related to the areas of computer vision, image processing and robotics. VICOROB is composed of 75 members (22 PhDs) and in the period 2007--2012 has participated in 21 European and Spanish Research Projects (4,5M€) and 23 Industry Contracts (1M€), has supervised 55 PhD/MSc theses and published 97 articles in journals, 47 book chapters and 180 conference attendances.



**GIRONA UNDERWATER
VISION AND ROBOTICS**

Girona Underwater Vision and Robotics Lab

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[Girona Underwater Vision and Robotics](#) research lab, as part of the Institute, has a strong experience in the design and development of hovering AUV prototypes with high-resolution image mapping capabilities. 5 AUV prototypes have been designed during the last 10 years, all of them having a different conceptual design. Being [GIRONA 500 AUV](#) and [SPARUS II AUV](#) the currently operative platforms. During the last years the team has worked on the development of advanced image processing techniques for the 2D and 3D mapping of the seafloor, as well as with the fusion of these techniques with navigation data coming from state of the art navigation sensors (DVL, gyros, USBL) together with global optimization techniques to face large-scale maps. Map based navigation and SLAM of underwater robots using both acoustics and/or video images is currently one of the main topics of research. VICOROB has also a long experience in intelligent control architectures and has contributed in mission control systems, behaviour-based architectures, robot learning and path planning for AUVs. Finally, the group has expertise in mechatronics and software integration. Recently, 4 Sparus II AUVs have been developed to be delivered to external research institutions, three of them participating in the EU-funded euRathlon underwater competition. UdG has consistently shown in the past that it can afford young and senior researchers the proper intellectual setting for training in the interdisciplinary field of cooperative autonomous robotics. After 20 years doing research, the team has become a benchmark in Europe for the design and construction of autonomous underwater vehicles, and the development of cutting edge software for the processing of visual and acoustic data. The team is also a member of [TECNIO](#) network of Excellence in technology transfer in Catalonia region. We are located in [Scientific and Technological Park](#) of the UdG.