

CONTROL APPLICATIONS IN MARINE SYSTEMS

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INTELLIGENT SYSTEM FOR COLLECTING, ANALYSIS AND PRESENTATION OF UNDERWATER ENVIRONMENT INFORMATION

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ABSTRACT

The paper discuss fundamental determinations of intelligent system for collecting, analysing and presentation of underwater environment information, currently in development under the contract of Ministry of science, technology and informatics of Republic Croatia.

System is conceived as an assembly of few distinctive parts. In the middle of the system is a commercial, remotely operated underwater vehicle equipped with different sensors including video camera. Vehicle is controlled by computer located on the base ship through the umbilical cable. The second important part is a computerized system for selective collecting, analysing and presentation of underwater environment information.

Beside the usual vehicle manual control, the system will posses a certain intelligent properties and reaction currently in development under the sub project: SUBMERSIBLE, SENSORS and EXPERT.

Sub project SUBMERSIBLE includes theoretical investigation and development of

- intelligent, automatic, self-protective vehicle reactions in hazardous situations,

- sensory based vehicle control, from conventional auto depth and auto heading control, to more sophisticated vision-based control which includes dynamic scene and motion analysis, and vision-based obstacle-avoidance.

Sub project SENSORS is dedicated to development of

- system for intelligent and selective collecting of information obtained by sensors taking into account, the main mission task, and
- fusion of information obtained by different sensors and their integration in complete picture of underwater environment.

The third sub project EXPERT includes theoretical analysis and development of methods and procedures for

- post processing of collected data including intelligent interpretation and incorporation of human knowledge about environment,
- presentation of data and knowledge using "hypermedia" principles for interactive communication between user and machine.

The paper presents fundamental determinations, the structure and methodology of the project with special attention given to our previous research on which the projects is based, primarily in the field of fuzzy set theory applications for modelling and intelligent control.