CSurvey

A Semi-Autonomous Inspection Unit for Underwater Structures and Ship Hulls
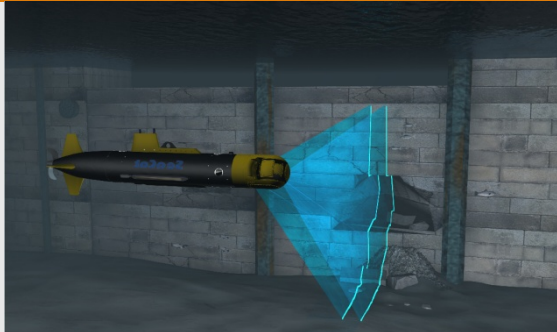

Fig.1: Operational scenario of autonomous Mole Inspection with the AUV SeaCat from Atlas Elektronik (Source: Atlas Elektronik)

Fig.2: Inspection unit (HD-Kamera, Structured Light System, Multibeam Profiling Sonar)
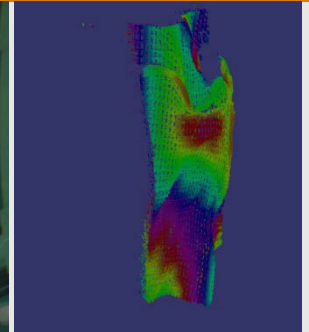
Fig.3: High resolution reconstruction in 3D

A Flexible Semi-Autonomous Inspection Unit for the Detection of Anomalies

The goal of the project CSurvey is the development of a semi-autonomous inspection unit which can be mounted on underwater vehicles and which provides the ability to detect anomalies at underwater structures as well as at ship hulls.

In this context, anomalies are defined as deformations and unknown objects of any kind. To detect these anomalies, visual detection methods based on online computer vision algorithms, laser pattern projection and a multi-beam echo sounder are combined (Fig. 2). Due to the constraints of underwater wireless data transfer, detected anomalies are stored in situ on the system during an operation and can be reviewed and checked afterwards by an operator. The sensor systems will be mounted on a pan-tilt unit to provide a means for compensation of movements of the host system and to provide the ability to make detailed scans of regions of high interest.

CSurvey is a sub-project within the project CView. This inspection unit will be mounted on the autonomous underwater vehicle (AUV) "SeeCat" (Fig. 1) and will receive the required information regarding localization from this host system.

The CSurvey inspection unit can be mounted on different host systems and can be adapted to several operation scenarios.

Some of its goals are:
• Prevention of damage by the ability of early detection based on regular and comprehensive inspection
• Cost minimization due to early detection of damages
• Generation of storable, comparable measurement data

CSurvey is intended to be the basis for many applications and products in the area of underwater inspection. Furthermore, it can also be used in other areas like production, logistics, or security.

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