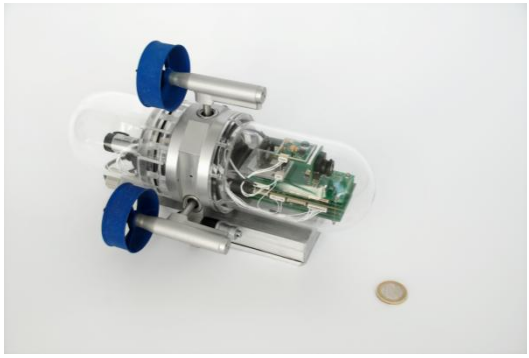
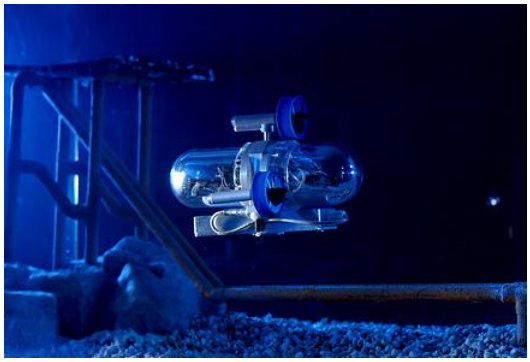
µAUV²

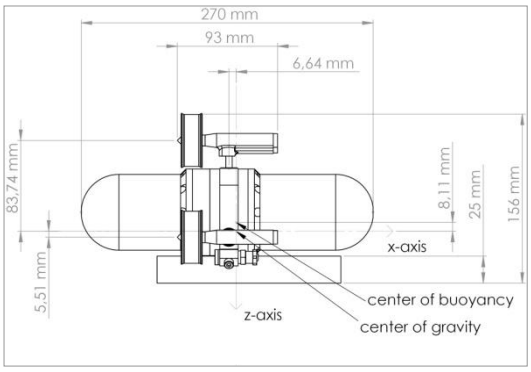
A Miniaturized Autonomous Underwater Vehicle



The size of the µAUV² in comparison to a 1 Euro coin.



The µAUV² during inspection



Design drawing of the µAUV²

The Vehicle

The µAUV² belongs to the group of autonomous underwater vehicles which are characterized by their ability to return to their point of departure after carrying out tasks without any physical connection via cables or radio contact with the operator. These vehicles are used in research and industry and feature a length of 2 – 7 m. The present µAUV² which was entirely developed and constructed by the DFKI in Bremen is one of the smallest AUVs worldwide.

Application Scenarios

Because of its small size, this vehicle is currently used in test beds to evaluate techniques and methods that may also apply to larger AUVs. Complex control strategies for position control and attitude-using learning techniques from artificial intelligence, the evaluation of self-localization methods by combining the data from the µIMU with the camera images and different approaches towards energy-efficient locomotion und underwater charging mechanisms are only a few of these methods which can be evaluated.

Technical Data

Dimensions: 27 x 7 x 7 cm, Weight: 1.2 kg, maximum operating depth: 10 m, maximum velocity: 1.5 m/s, maximum operating time at average speed: 1 hour, thruster turnable by 180 , movements in 4 degrees of freedom, buoyancy compensation through micropump, navigation through in-house developed µIMU (accelerometer, gyroscope, magnetometer), camera system consisting of one camera at the bow and one directing downwards, (750 x 480 pixel, at 60 fps), image processing and control via Blackfin DSP and Virtex 4 LX FPGA, communication with the vehicle via optical IrDA operating at 19200 bps.

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