

AUTOMATIC STABILIZATION OF UNMANNED UNDERWATER VEHICLES OVER THE SEABED OBJECTS ON THE BASE OF PHOTO IMAGES

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ABSTRACT

Underwater vehicles stabilization on the seabed objects finds use in many applied problems in the modern underwater industry. The solution of this problem without the use of visual cues leads to the accumulation of the error value and drift toward the accumulated error. The paper describes algorithms and software designed for holding of underwater vehicle over the seabed in the automatic mode. Initial information is a series of digital photos with a small period of updating. The objects on the seabed can be any objects of arbitrary shape. Thus, the problem of determining the displacement on a sequence of two images is reduced to the recognition problem and definition of the detected object parameters. Applied recognition algorithm uses the key points on the image and Hough transformation. To suppress fluctuations in the longitudinal and transverse direction relative to the detected object the DVL are used. Applied control and recognition algorithms have low resource consumption, which allows using them on board in real-time mode. Sea trials confirmed the efficiency of algorithms and software system as a whole.

Key words: AUV, ROV, underwater vehicle, stabilization, photo, image recognition.

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