METHOD OF FORMATION OF PROGRAM CONTROL SIGNALS FOR MULTILINK MANIPULATORS OF UNINHABITED UNDERWATER VEHICLES

A.Yu. Konoplin, N.A. Krasavin, D.V. Kopylov

The paper proposes a new method of formation of program control signals for multilink manipulators of unmanned underwater vehicles, which ensures preservation of the required accuracy of technological manipulation operations performed by these vehicles in the mode of stabilized hovering near the objects of work. This is achieved by additional movements of the manipulator working tool and changing its orientation on the basis of information about real angular and linear displacements of the vehicle relative to its initial stabilization position. At the same time, the desired speed of the tool movement along a given trajectory is corrected in such a way that the manipulator has time to compensate undesirable displacements of the vehicle. Numerical modeling of the implemented method was performed. The model of the PUMA-type manipulator created in Matlab/Simulink, installed on an unmanned underwater vehicle stabilized in the hovering mode, was used. Visualization of the system operation was performed in the virtual simulation environment CoppeliaSim. The results of the simulation confirmed the performance of the method and showed the effectiveness of its use to improve the accuracy of underwater manipulation operations.

Keywords: multilink manipulator, uninhabited underwater vehicle, speed control, trajectory correction, manipulation operations, stabilized hovering mode.

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About the authors

KONOPLIN Aleksandr Yurievich, Ph.D, leading researcher
Institute of Marine Technology Problems Far Eastern Branch of RAS
Address: 690091, Vladivostok, Suhanova str., 5a
Research interests: automatic control of underwater robots and manipulators, adaptive control, information and control systems
Phone: 89244298396
E-mail: konoplin@marine.febras.ru
ORCID: 0000-0001-7554-1002

KRASAVIN Nikita Andreevich, researcher
Institute of Marine Technology Problems Far Eastern Branch of RAS
Address: 690091, Vladivostok, Suhanova str., 5a
Research interests: automatic control of underwater robots and manipulators, mathematical models of dynamic systems, information and control systems
Phone: 89025063014
E-mail: nakrasavin@yandex.ru
ORCID: 0000-0003-1102-5409

KOPYLOV Denis Vladimirovich, junior researcher
Institute of Marine Technology Problems Far Eastern Branch of RAS
Address: 690091, Vladivostok, Suhanova str., 5a
Research interests: automatic control of underwater robots and manipulators, mathematical models of dynamic systems
Phone: 89996147161
E-mail: kopylov.dvl@yandex.ru
ORCID: 0009-0008-5725-8260