ON THE SEARCH FOR NOISE SOURCES BY A GROUP OF INTERACTING AUVS USING A GENETIC ALGORITHM

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Marine unmanned systems are increasingly used in tasks related to search and observation missions. Protection of water areas, survey and inspection operations, tracking of marine animals are examples of such missions. Most of these tasks can be solved more efficiently by use a group of interacting marine drones, compared to single vehicle. The article considers the problem of passive detection and localization of noise objects in a given water area by use a group of autonomous underwater vehicles (AUV). It is assumed that antennas of scalar vector receivers are installed on board the AUV to detect and determine the direction to the noise source. Some ways of organizing the group work of such AUV are considered. A centralized version is investigated, when the collected current information from all AUV is transmitted to one AUV leader. On the base of received information processing, AUV leader forms a group work plan, including the motion parameters for all AUV, to detect and determine the location of noise sources. An approach based on the use of a genetic algorithm is considered, and several versions of its implementation are investigated. The results of model experiments are presented, which demonstrate the efficiency of the proposed algorithms.

Keywords: group operation, genetic algorithm, autonomous underwater vehicle, detection of foreign objects.

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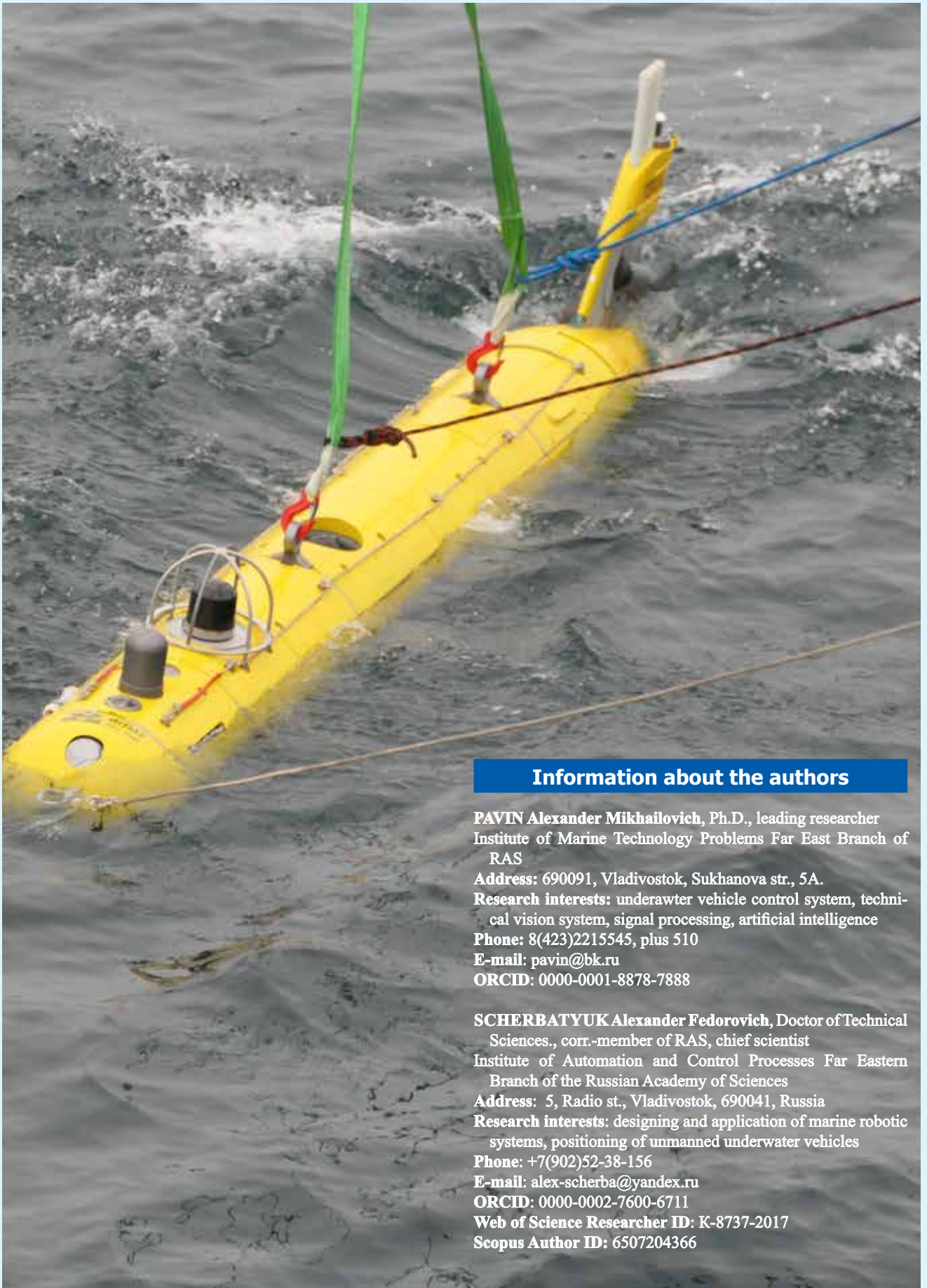
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