

Development of a demonstrator for predicting the operation of unmanned vehicles on naval platforms.

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ABSTRACT

The "System for Predicting the Operation of Unmanned Vehicles on Naval Platforms" (SPOVENT) project aims to determine the studies and developments necessary to obtain and characterise the data required to predict the ship's movements in real time and, therefore, to be able to predict the optimum times for recovering/landing UAVs.

After the completion of the first two phases of the project, whose main objectives were the determination of the available technology applicable to the prediction of the movement of the vessel during its operation, the determination of the maximum movement limits of the vessel in order to carry out the capture of UAVs in safe conditions and the development of two algorithms for predicting the movement of the vessel depending on the wave that it will encounter during its navigation, the validation and evaluation of the developed algorithms is initially carried out, followed by the development of the SPOVENT system demonstrator, implementing the algorithm that presents the best results.

To determine the algorithm with which the best results are obtained in the prediction of time windows in which the UAV will be able to operate, the following evaluation and validation criteria are established: accuracy of the prediction of the operation windows, range of application, previous data required for its correct operation, possibility of adaptation to different types of vessels and required calculation time.

Once the algorithm to be implemented in the demonstrator has been selected, a computer application is developed that shows the user the time windows to perform these operations with greater safety. The design of the application ensures that user intervention is minimal, considering the operating conditions on a ship, including easy-to-read indicators and easily accessible buttons. Additionally, the demonstrator will be a tool to evaluate the operational criteria (STANAG) of different missions during navigation, by means of the ship's movement variables registered by an IMU sensor.