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Underwater robotics has been one of the fields of research that has awakened most in recent decades, this has achieved an evolution of this field. Advances in underwater robotics have been implemented in areas other than research, within the benefits are the commercial sector and the military sector as well as the academy. Underwater robotics has been one of the fields of research that has awakened most in recent decades, this has achieved an evolution of this field. Advances in underwater robotics have been implemented in areas other than research, within the benefits is the commercial sector and the military sector as well as the academy.

The development of everything related to underwater vehicles, therefore progress is made in control systems in addition to the mechanical and structural design. This thesis focused on the design and construction of an underwater autonomous vehicle for the DIVISAMOS project. From the analysis of the current state of underwater robotics, the proposed design includes all the favorable aspects of the existing vehicles, in this way it has characteristics that optimize the vehicle, giving it versatility and efficiency of operation. In the research process, it was mainly aimed at the integration of mechanical design methods that optimize the characteristics of the vehicle that was built, thus presenting a hybrid truck with efficient displacements and the possibility of development. It should be noted that the design methods presented in this test incorporate sensor systems for the development of monitoring missions, Simultaneous Localization and Mapping (SLAM), the bathymetry of submarine environments with high-resolution georeferenced data generation and its cartographic projection. With all this you can ensure that a high-performance vehicle was built.

With the analysis of the results obtained with the implementation of Computational Fluid Dynamics (CFD) was achieved that the vehicle

has low power consumption and that has been thoroughly studied aspects of the hydrodynamic shape of the vehicle's hull to reduce the drag force. Within the results of this aspect a model is presented that incorporates the calculation in real time of the forces for the analysis of the drag generated by the water currents that interact with the hull of the vehicle, reducing with this the high computational cost of the CFD analysis and enriching dynamic modeling.

The dynamic and kinematic model of an Autonomous Underwater Vehicle (AUV) revises a greater degree of complexity that depends on the inertial navigation that works in the measurements of the instruments and the reference to determine its position. Transformation matrices are an effective method used for the mathematical modeling of robot arms. In this thesis a hybrid mathematical model was used that uses transformation matrices to propose the kinematics of the AUV, this model has the peculiarity of allowing the aggregation of elements to the initial model continuing with the same formulation, resulting in a great utility for cases in which the AUV performs missions in which objects are manipulated and due to this incorporates an arm robot.