

## **Design and Construction of an Autonomous Underwater Vehicle for the launch of a small UAV**

**A. Cadena**

**Department of Electrical and Computer Science, Guayaquil, Ecuador.**

**acadena@fiec.espol.edu.ec**

**arturocad@hotmail.com**

**This paper describes the design and construction of a low cost Autonomous Underwater Vehicle (AUV) prototype that can work as launch platform of a small UAV. The AUV can travel in a determined path to reach the launch UAV point. The AUV length is less than 2 m. The max operation depth is 20 m. It is composed of eight modules: propulsion, power, motor driver, CPU, sensor suite, camera system, communication module and UAV launcher. The launch of the UAV is executed on the sea surface. The propulsion module is formed by four thrusters, two axial and two oriented vertically, this configuration gives to the AUV four degrees of freedom: heave, surge, yaw and pitch. The CPU is a Cyclone II FPGA Development Kit. The sensor suite contains all the sensors of the AUV that are: inertial measurement unit, GPS, compass and inclinometer for the AUV's dynamics measurement, temperature and conductivity sensors for the environment measurement. The UAV uses a rocket motor to take off from the AUV. Possible applications for this system can be a reconnaissance role or in an armed version to attack stationary targets.**

**Keywords: Autonomous Underwater Vehicle (AUV)**

**Unmanned Aerial Vehicle (UAV)**

**GNC (guidance, navigation, and control)**

**Inertial Navigation System**

**IMU (Inertial Measurement Unit)**

**Mission Planner**