X4-ROV: The Open Source Underwater Vehicle

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Abstract The biggest bottleneck of currently available Remotely Operated Vehicles (ROVs) is the cost of the systems. Therefore, to reduce operational costs and system complexity, the development of micro or handheld inspection ROVs has been increasing lately. An open-source underwater vehicle startup has contributed to the community by producing cheap ROVs, encouraging users to develop their own underwater vehicle. In this project, a low-cost ROV prototype, called X4-ROV using open-source OpenROV computer hardware and software is developed. This new design includes hardware, firmware, software and control architectures.

Keywords OpenROV · X4-ROV · Open-source

1 Introduction

Underwater vehicle is classified into two basic categories which is manned vehicles and unmanned vehicles. These vehicles are divided into a group and subgroup depending on their class/characteristics as shown in Fig. 1.

ROV is the common accepted name for tethered underwater robots. Different from AUVs, ROVs are tele-operated robots, highly maneuverable and operated from a command center. They are linked to command center by a tether which is a group of cables that can carry electrical power, video and data signals back and forth between the operator and vehicle. Most of ROVs are equipped with at least a video camera and lights. Additional equipment is commonly added to the vehicle to expand its capabilities.

Nowadays, several underwater vehicles and robotic platforms have been developed with low cost components, for instance, control platforms that use

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