Make-ROV, an Advanced System-Based Educational Outreach ROV

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Make-ROV is an easy-to-make educational outreach ROV (Remotely Operated underwater Vehicle) which provides an ROV kit-set for people to use it as a basic observation use ROV or customize it to an advanced multi-function ROV. Although there are numerous marine resources for us to explore, most people have not enough skills to make their own ROV. Since purchasing a commercial ROV is really expensive, and other educational outreach ROVs may only have a simplistic structure or can only be an observation used ROV. So our goal is to make a highly extendable, easy-to-develop educational outreach ROV, allowing people to decide the frame, the tools and the function, thus create their own desired ROV, and have an easier way to explore the ocean. In order to reach our goal, the ROV should be system controlled, which increases its stability and extendibility. Users can first build the Make-ROV as basic observation ROV, then they can upgrade it and add some advanced functions to it. Sensors can also be attached on the ROV and the data will show on a monitor. While configuring the system, we provide a phone application for setting assistance. Also, after setting up the ROV control system, users can choose our default ROV frame or create their own ROV frame with PVC pipe or aluminum bars, extending the ROV to their desired functions. Then, in order to let the system be secure and waterproof, we designed an easy-to-assemble waterproof screw thread mechanism to secure it. After building and upgrading Make-ROV, we have a set of systematic tutorial to encourage users to apply it to actual underwater experiments. With Make-ROV, we hope that we can introduce an easier way for users to develop their own ROV and use it as a contemporary method to explore the marine environment.

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