LINEAR/ANGULAR POSITION STABILIZATION & CONTROL OF AN UNDERWATER ROBOTIC SYSTEM

Tech ID: 29309 / UC Case 2018-134-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,820,475	11/21/2023	2018-134

BRIEF DESCRIPTION

There are several emerging applications for Autonomous Underwater Vehicles (AUVs) where the agility and accurate control of location and/or orientation is critical. In the presence of random ocean currents and waves, conventional AUV systems need to use a combination of their thrusters to generate an appropriate force/torque and cancel the external disturbance to maintain the desired attitude or position. This is a relatively slow response since it requires accelerating and pushing water around the vehicle body. Thus, existing AUVs have disadvantages: (i) accurate and agile orientation and position control/stabilization is challenging; (ii) since thrusters are operational during reorientation maneuvers, a substantial amount of power is consumed to pump the bulk fluid, wasting the precious power storage of the vehicle and thus reducing its operational time; and (iii) drag forces and torques exerted on the thrusters significantly affect the efficiency of reorientation maneuvers.

UC Berkeley researchers have designed a new device for fast stabilization and control of an underwater robotic vehicle. In this architecture, the attitude maneuvers are performed using reaction torques that the body of the vehicle gains from a central inertial system.

SUGGESTED USES

- Oceanic research
- Deep ocean imaging or optical data communication

ADVANTAGES

- Accurate and agile orientation and position control/stabilization
- Increased operational time

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OTHER INFORMATION

KEYWORDS

Autonomous underwater vehicle, ocean, robotic

CATEGORIZED AS

» **Environment**
» Other
» Sensing
» **Imaging**
» Remote Sensing
» **Transportation**
» Other
» **Engineering**
» Robotics and Automation

RELATED CASES

2018-134-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- PowerCab: Mobile Energy Harvesting Platform for Energy Generation, Conversion, and Delivery
- Wave-Powered Desalination System Using A Multi-Cylinder Rotary Crankshaft Pump

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