Unmanned surface vehicles ensure reservoir security in China

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The newly developed unmanned surface vehicle is on patrol in a reservoir located in Shenzhen, China. Credit: HFIPS

A new drone boat has successfully completed its mission in a reservoir located in Shenzhen, China. Developed by a collaborative research team led by scientists from the Hefei Institutes of Physical Science (HFIPS) of Chinese Academy of Sciences, this security unmanned surface vehicle features a larger size, enhanced functionality, and greater

intelligence.

"Our unmanned surface vehicle (USV) is 7.5 meters long, 2.5 meters wide, and reaches 13 km/h, the same speed as an alligator," said Yu Daoyang, who led the team, "The 70-kWh lithium battery enables extended navigation of more than 65 km."

With AI and robotics technology, intelligent equipment can conduct advanced monitoring of reservoir areas around the clock. Through manual inspection, intelligent inspection, video monitoring, and instrument monitoring, a dynamic monitoring system can be built, which improves the automatic collection and analysis of intrusion information data, enabling accurate intrusion detection and law enforcement in the reservoir area.

"We have applied several inventions to this large drone," said Yu.

A Simultaneous Localization and Mapping (SLAM) system enables autonomous navigation, obstacle avoidance, and mapping even in areas without communication or satellite navigation signals.

In addition, the USV features an all-electric steering architecture and control system that seamlessly integrates manual, remote, networked, and unmanned control, overcoming compatibility and robustness issues between conventional ship control systems and intelligent systems.

Furthermore, the USV employs an intelligent algorithm for automatic image monitoring and water surface target recognition, using deep learning algorithms to detect and classify prohibited persons and objects along shorelines, providing accurate identification and warnings.

Finally, a simplified system that allows for seamless switching between unmanned and manual control systems, enabling autonomous navigation

and control without the need for external devices.

These advancements, which allow the USV to navigate autonomously and provide accurate identification of activities, ensure efficient and reliable reservoir security measures, according to the team.

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