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Patent Search

Invention Title	A SYSTEM FOR AUTONOMOUS RIVER CLEANING AND WASTE MANAGEMENT
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Abstract:

A system (100) for autonomous river cleaning and waste management, comprising a navigation module (102) configured with GPS and AI-based algorithms to guide t... across predefined and dynamic paths in a river environment. The system further comprising a waste detection unit (104) including an image processing module and ... learning models to identify floating, submerged, and semi-submerged waste materials. The system further comprising a waste collection mechanism (106) operativel... to the detection unit (104) and configured to autonomously retrieve detected waste using an actuator-driven arm or conveyor mechanism. The system further compr... quality sensing module (108) configured to measure parameters including turbidity, pH, dissolved oxygen, and pollutant levels. The system further comprising an IoT-... transmission unit (110). The system further comprising a renewable energy supply module (112) comprising solar panels and battery storage.

Complete Specification

Description:FIELD OF THE DISCLOSURE

[0001]   This invention generally relates to the field of environmental automation systems, more specifically to an autonomous, GPS-guided river cleaning and wast... management system utilizing artificial intelligence, IoT, and renewable energy sources for detecting, collecting, and managing waste in aquatic ecosystems.

BACKGROUND

[0002]   The subject matter discussed in the background section should not be assumed to be prior art merely as a result of its mention in the background section. Similarly, a problem mentioned in the background section or associated with the subject matter of the background section should not be assumed to have been pre... recognized in the prior art. The subject matter in the background section merely represents different approaches, which in and of themselves may also correspond... implementations of the claimed technology.

[0003]   Water pollution caused by industrial discharge, plastics, and other waste materials is a growing environmental challenge. Rivers, being natural waste carrie... accumulate massive volumes of debris, severely impacting aquatic ecosystems and public health. Traditional manual cleaning techniques are labor-intensive, slow, a... inefficient, often failing to reach inaccessible or high-flow areas of rivers. Moreover, the lack of real-time waste data prevents authorities from effectively managing a... mitigating pollution trends.

[0004]   Several attempts have been made to automate river cleaning through semi-autonomous boats and robotic mechanisms. Some systems incorporate GPS navigation, while others integrate basic sensors for obstacle detection. However, most existing systems suffer from limited autonomy, poor scalability, inability to ad... changing water and waste conditions, lack of energy efficiency, and absence of real-time analytics or AI-based decision-making for optimized waste sorting and colle...

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