Solar Based WiFi Controlled River Cleaning Robot

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Abstract*: The increasing pollution in rivers due to the accumulation of waste has raised significant environmental concerns. Manual cleaning processes are labor-intensive, time-consuming, and inefficient, especially for large water bodies. This project aims to develop a solar-powered, Wi-Fi-controlled river-cleaning robot that autonomously collects floating waste from water bodies, providing a sustainable and efficient solution to water pollution.*

The system is powered by a 12V rechargeable battery, continuously charged by a 10W solar panel, making it self-sufficient. The robot's mobility is driven by DC gear motors connected to propulsion wheels, allowing it to navigate on the water's surface. A net chamber is integrated at the front of the robot for collecting floating debris, which can be periodically removed and emptied.

The core of the robot's control system is the NodeMCU microcontroller, which is programmed to control the movement of the robot through a motor driver (L298N). The robot can be remotely operated via a Wi-Fi connection, enabling easy control using a smartphone or computer. This system offers an eco-friendly solution that reduces reliance on external power sources, contributing to sustainable river cleaning operations.

This project demonstrates the integration of renewable energy, automation, and IoT technology to address the challenges of water pollution. Through its successful implementation, the robot provides an innovative approach to keeping rivers clean while minimizing human intervention..

Keywords: NodeMCU microcontroller