

Robot For Drainage Blockage Systems

Development of an Autonomous Robotic System for Detecting and Locating Drainage Blockages

Abstract

Blockages in drainage systems can cause flooding, contamination, and expensive repairs. This paper introduces an autonomous robotic system designed to detect and locate blockages in drainage networks efficiently. The system combines advanced sensors and autonomous navigation to identify and map blockages.

The robot is equipped with ultrasonic, infrared, and camera-based sensors to detect obstructions and assess pipe conditions. It processes data using image processing and neural network algorithms to accurately classify and locate blockages. For navigation, the robot uses GPS and inertial measurement units (IMUs) to move through complex drainage networks autonomously.

Field tests in different drainage environments show that the system detects blockages with high accuracy and reliability. The results demonstrate that the autonomous robotic system can significantly reduce the time and cost of manual inspections and repairs while minimizing risks to human inspectors.

In conclusion, this autonomous robotic system advances drainage maintenance technology by improving inspection efficiency and safety. Its use of Raspberry Pi, DC motors, stepper motors, Bluetooth modules, and the L293D motor shield makes it scalable and adaptable to various drainage systems. This innovation offers a safer, more efficient, and cost-effective urban infrastructure maintenance solution.

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