Chapter 5
Review on Smart Sewage Cleaning UAV Assistance for Sustainable Development

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ABSTRACT

Autonomous systems that cannot adapt to real-world environments have proliferated due to rapid technological improvement. These programmes will free people from repetitive, inefficient chores. The monotonous, dusty, and dangerous conditions of the unmanned aerial vehicle (UAV) pose a severe threat to human health and safety. Autonomous systems improve supply chain, tracking, and hazardous climate control. This chapter proposes merging compression and track architecture to improve UAV performance. The UAV and pipe increase trackwheel friction. The UAV doesn't move in the tube. Cleaning commences when sensors detect the mouth. Dirt sensors prevent the washing process from working. This chapter focuses on drain cleaning automation. Device automation addresses mobility and space. This study supports this method for garbage disposal and filtering. The technology removes manual cleaning and relies on human control of system movement.

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INTRODUCTION

Municipal corporations are responsible for the cleaning, maintenance, and protection of cities. The drainage systems of many communities are buried beneath. When the drainage system is not maintained properly, potable water can become tainted with drainage water, which can lead to the spread of infectious diseases (Pandey, D., et al. (2021)). Drainage systems become clogged during rainy seasons, which makes day-to-day life more difficult. It's possible that the atmosphere, the traffic, and the people will all aggravate you. Most of the time, clogged drains will cause sewage and other kinds of wastewater to overflow into your property. Consider constructing a facility that would provide authorities or other interested parties with instant access to information regarding the quantity of blockages as well as their location. Therefore, sensors watch for any lapses in maintenance. The sensor notifies the transmitter whenever a drain becomes clogged or water overflows its intended path. It is difficult for humans to maintain the maintenance holes due to the deteriorating environment and the difficulties of monitoring the entire status. It is impossible to know whether someone purposefully entered the maintenance hole or whether they were there because of an accident. Drainage systems are essential to urban populations in order to prevent flooding. Many people are harmed by inadequate drainage system upkeep. Road conditions are negatively impacted by inadequate drainage monitoring systems in many places. Roads are designed to handle both automobile traffic and pedestrian traffic. Insufficient monitoring of drainage systems is the root cause of water contamination and the spread of diseases that are transmitted through water in many cities and towns across the globe. Highways frequently have problems with water pooling up. Flooding results in traffic congestion, which wastes time, money, and employment opportunities. The contamination of groundwater can be very challenging to eradicate. For its economy to expand, India requires a reliable drainage system. Smart cities depend on drainage system design. More employees are required in order to keep a drainage system in good working order. As a result of the unstructured nature of the cleaning environment, engineers have made significant progress in the areas of artificial intelligence, unmanned aerial vehicles, and robotics (George et al., 2021). However, this continues to be a challenge. Pandey et al. (2022) provide a home wastewater purifying unmanned aerial vehicle (UAV) in this work. The treatment of wastewater is the primary focus of the majority of mobile UAV experiments. Documentation regarding drainage UAVs is limited. It would appear that their expertise lies in the coverage algorithm. This article explains how to construct a fully autonomous UAV mobile for the purpose of cleaning drainage systems. The planning of tracks on a global scale needs to end at a specific point in artificial areas such as home hallways, for example at the intersection of two corridors. The UAV plans out local detours to get past obstacles like walls. Therefore, the navigation system requires a framework in order to describe and find these building placements on a world map that ultimately leads somewhere. The entry hallway has been designed with an open floor plan. According to Yadeta et al. (2020), the IIoT is essential to improving industrial efficiency, quality, cost, and resource reduction. IIoT-based project implementations, on the other hand, have very little documentation. The technology of the IIoT makes it difficult for typical businesses to upgrade their antiquated automation devices. This article takes a look at the automation of sewage treatment plants that relies on technical skills. The core controller of the STM32 processor located in Geneva, manufactured by STMicroelectronics, makes older automation equipment better. Tencent's We Chat Applet, which is located in Shenzhen, serves as the enlarged host computer. Buildings are being outfitted with IIoT-based remote monitoring and control systems for sewage treatment. The use of unmanned aerial vehicles (UAVs) has witnessed phenomenal growth in popularity over the past few years, with applications ranging from agriculture and urban