

# ***IOT-BASED WASTE DEPOT MONITORING SYSTEM WITH CAMERAS AND ODOR SENSORS TO DETECT POTENTIAL POLLUTION***

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## ***ABSTRACT***

*Waste that is not managed properly will produce dangerous gases such as ammonia (NH<sub>3</sub>) which have a negative impact on health and the environment. The increasing volume of waste in various regions, including Yogyakarta, causes accumulation in waste depots and has the potential to cause air pollution due to toxic gases. This research aims to design a system capable of detecting ammonia gas levels, sending real-time notifications, and taking photos. This system uses ESP32 and ESP32-CAM microcontrollers, DFRobot MEMS ammonia gas sensors (1-300ppm), LCDI2C, Node-RED platform and Telegram as a dashboard and notification. The NH<sub>3</sub> sensor will detect ammonia (NH<sub>3</sub>) gas levels and display them via LCD, Node-RED UI Dashboard, and Telegram. If the ammonia level exceeds the threshold, the system will automatically send a notification to the Node-RED UI Dashboard and Telegram and the manager can respond to the garbage pick-up action via Telegram. ESP32-CAM to take photos automatically or manually. The results of this study indicate that the system is capable of detecting ammonia gas levels with a total error of 14.6% and an average error of 1.46%. It can also take photos automatically or manually, send automatic notifications via Node-RED and Telegram, display pickup status, display photos, trash bin locations, and historical waste management data.*

**Keywords:** *Ammonia (NH<sub>3</sub>), Internet of Things (IoT), Node-RED, Waste, Telegram.*