ABSTRACT

The improper separation of metal and non-metal waste reduces the effectiveness of environmental management. Low public awareness in sorting waste from the source results in valuable recyclable metals being discarded. Therefore, an automatic tool is needed to efficiently separate waste based on material type. Waste sorting is still largely done manually and remains inefficient. Metal waste such as iron, steel, and copper should be recycled to enhance their reuse value. Automatic separation systems offer a solution to improve recycling efficiency and reduce dependence on manual labor. The device is designed using an Arduino UNO microcontroller, inductive proximity sensor, a DC motor as a conveyor driver, and a servo motor as the separator. The system detects metal using the proximity sensor and automatically separates the waste. Testing was conducted on various types of metals and detection distance variations. The system successfully separates metal and non-metal waste with 100% accuracy. The sensor performs optimally on ferromagnetic metals up to a distance of 5 mm and on diamagnetic metals up to 3 mm. This tool is effective for implementation in recycling facilities.

Keywords: *waste sorter, inductive proximity sensor, metal, conveyor, Arduino Uno, automation*