ABSTRACT

**DESIGN AND IMPLEMENTATION OF A SMART TOILET SYSTEM
BASED ON ARDUINO UNO MICROCONTROLLER**

By

Fajar Abdurrozzaq

2011060022

2011060022.2011060022@mail.darmajaya.ac.id

With a holistic approach to the challenges faced by the elderly in toilets, this research not only presents technological innovation but also highlights the importance of addressing the specific needs of the elderly population in designing better and more inclusive sanitation infrastructure. This study develops an Arduino Uno-based smart toilet system to enhance cleanliness, comfort, and safety for users, especially the elderly. The system integrates a PIR sensor to activate lights and exhaust automatically, as well as an HC-SR04 ultrasonic sensor for an automatic flushing system. The research methodology includes a comprehensive literature review and prototype development. Testing was conducted five times, demonstrating that after an initial stabilization phase, the system works responsively and stably. Lights and exhaust remain on while motion is detected, with a 5-second wait time after no movement is sensed. The solenoid valve releases water for 8 seconds when an object is detected at a distance of 12 cm. In conclusion, the system successfully automates toilet functions with a slight delay during initial activation but subsequently operates harmoniously and according to expected performance.

Keywords: Automation, smart toilet, comfort, elderly, PIR Sensor, Ultrasonic Sensor HC-SR04.