

Automatic Sanitizer and Mask Dispensing Robot

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Abstract

This project is aimed at creating the Automated Hygiene and Mask Dispensing Robot that will improve the safety of the population due to absence of any human contact. The primary goal is the identification of approaching users and the automatic dispensing of hand sanitizers and masks.

Introduction

Background & Motivation

- Shared public surfaces increase disease transmission risk
- Need for automated, contact-free hygiene systems

Problem Statement

- Existing systems are expensive, single-purpose, or require supervision
- Limited availability of integrated low-cost solutions

Objectives

- Detect human presence automatically
- Dispense sanitizer without contact
- Dispense face masks on user request

Real-World Relevance

- Useful in universities, hospitals, offices, and public buildings
- Supports public health awareness and safety

System Overview

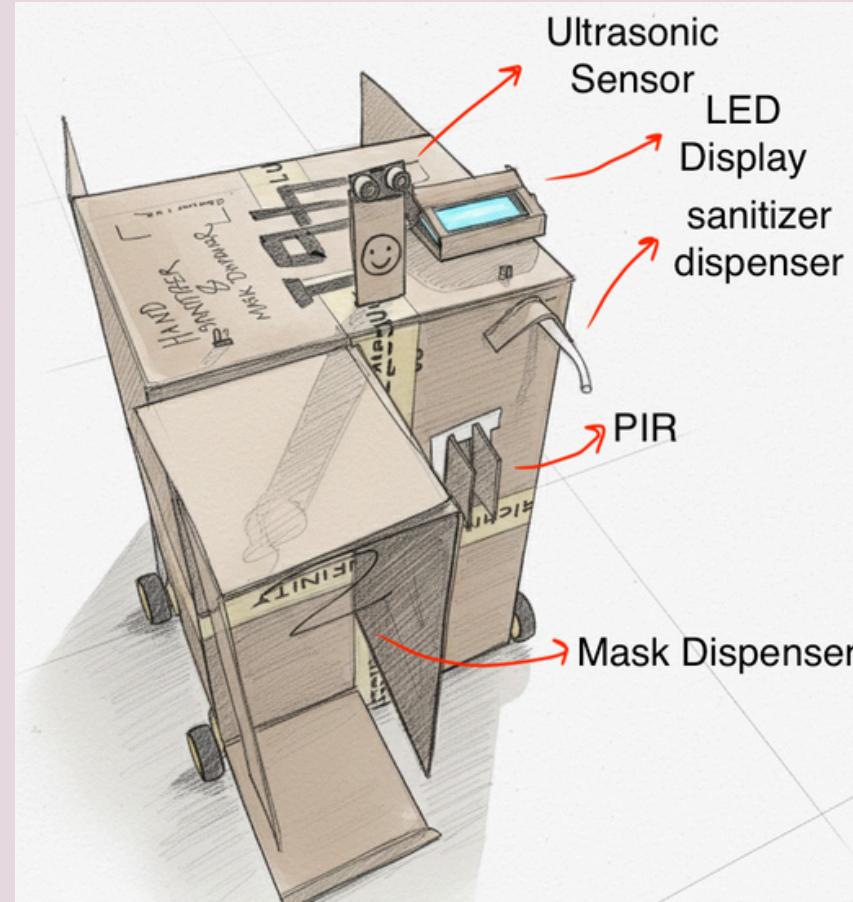


Figure 1: digital sketch of the robot

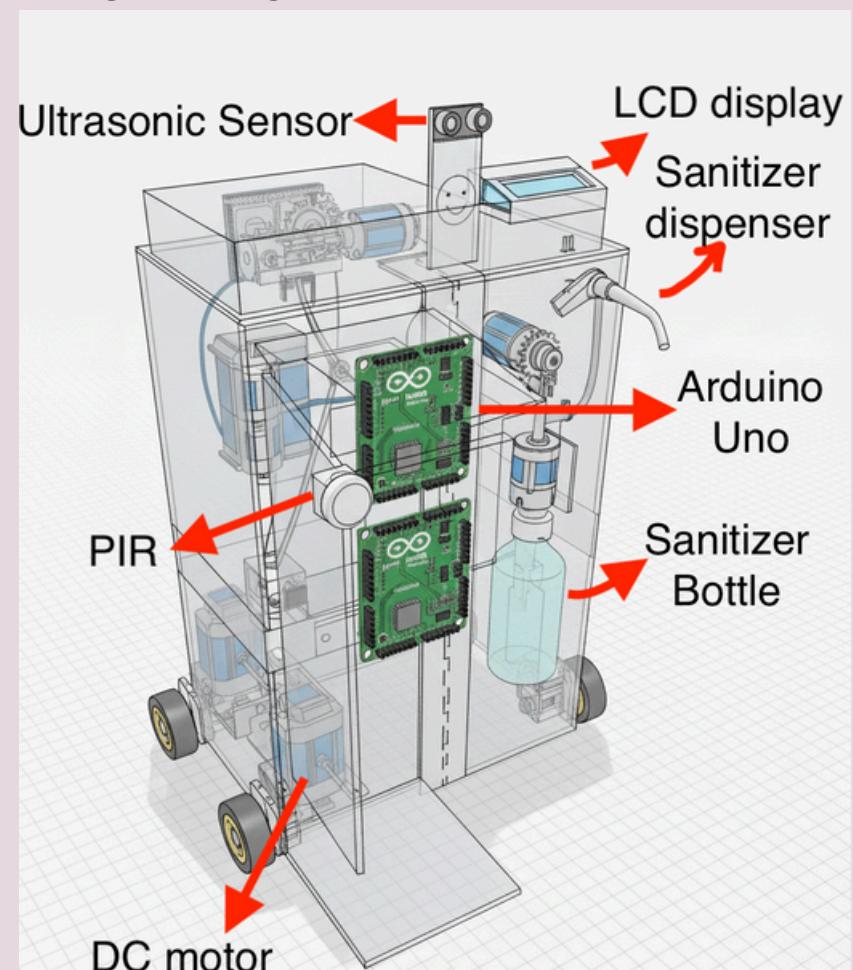


Figure 2: Mechanical structure of the robot

Implementation

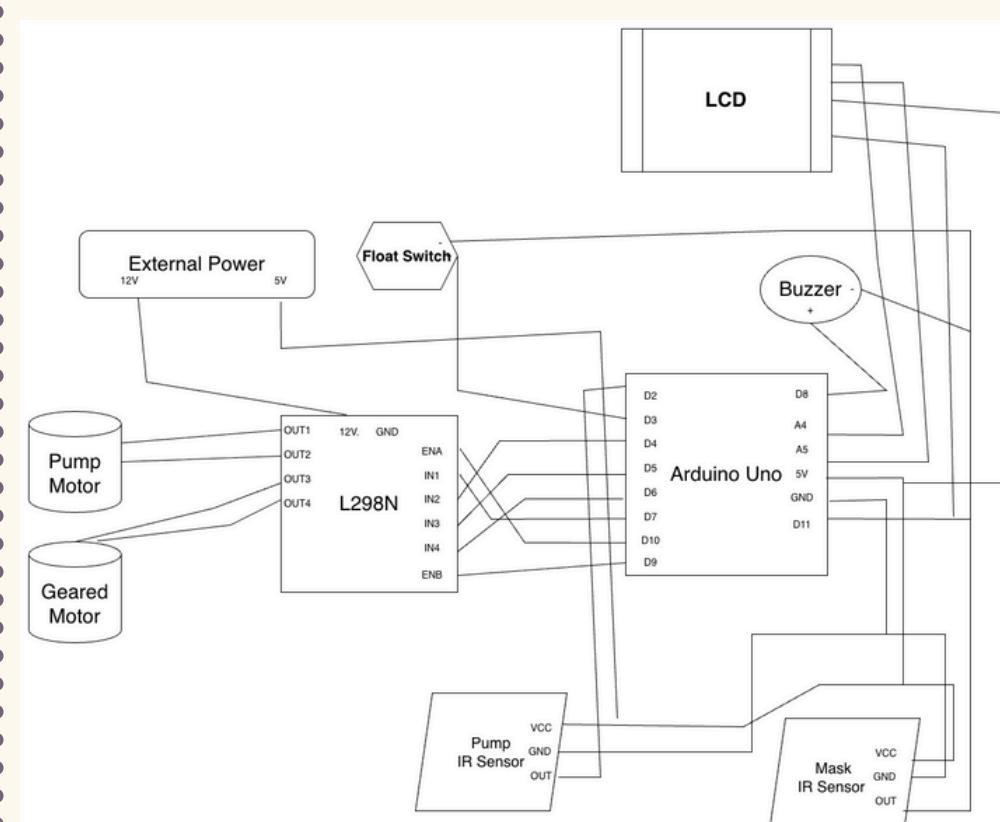


Figure 3: Circuit diagram of main dispensing module

Functionalities

Mechanical Functionality

- DC motor rotates to release one mask
- Pump activates for 1.5 seconds to dispense sanitizer
- Paddle mechanism prevents mask jamming

Software Functionality

- Arduino-based decision logic
- Timed delays to avoid false triggering
- LCD displays instructions and mask count

Software-Hardware Communication

- Digital I/O for sensors and actuators
- Real-time sensor data processing

Applications and Competitors

Applications

- Universities and schools
- Hospitals and clinics
- Offices and public buildings

Advantages

- Combined sanitizer + mask system
- Fully contactless
- Low cost and easy to install

Limitations

- Stationary design
- Limited sanitizer and mask capacity
- No user authentication

Conclusion

Successfully designed and implemented an automated, contactless hygiene robot for public safety. Integrated Arduino Uno, multiple sensors, and actuators into a single reliable system. Achieved automatic detection and controlled dispensing of sanitizer and face masks.