

Intro to Embedded Systems → Executive Summary

Touchless Sink w/ Three Distance Thresholds

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Objectives

Proposed is a touchless sink that uses a sonic sensor for multiple distance threshold and a keypad for simple temperature adjustment. The project is divided into 3 main parts:

- The distance sensor calibrated to three distances, off, on, and soap
- The keypad which adjusts angles of two servos controlling hot and cold-water valves
- Servos which will be adjusted to allow water flow with control

General Description

Sink is designed to be simple to both use and an adjust. Touchless sinks are a more sanitary option to regular sinks, and with the proposed product the inclusion the sensor activating soap removes the need to touch a soap dispenser. The keypad allows for easy adjustment of temperature, which will improve patience and lower time needed for temperature adjustment, saving time and money

Introduction

Sanitation is important, especially now in the current Covid crises. Washing one's hands is the best way to prevent the spread of disease and bacteria. While a touchless sink is not a new idea, it is one that can be improved upon. By using a distance sensor, we can have multiple distance thresholds, that allow for not only touchless water control but also touchless soap

dispensing all built in. Saving space and providing a better handwashing experience.

Operation

Operation is simple. The distance sensor will detect hands have entered the area of the sink and will dispense water. If the hands move closer to the back edge of the sink soap will dispense. The keypad will shift the valves for temperature control. 1 – 9 will shift the cold-water valve down from 90% open to 10% open and vise versa with the hot water valve.

Design Issue

With the current design, because of time and budget constraints, the keypad presents a few bugs. The servos may not always adjust or respond to key input and the system would have to be reset. The design is also proof of concept, most modern sinks will use solenoids and diaphragm which would improve the design

Things I learned

During this project, a lot was learned about design and implementation. Embedded system integration was also a great learning curve needed to adjust to during the design and development of this project

Areas of improvement

- Distance sensor calibration
- Higher quality keypad
- Replace servos with solenoids
- Use of diaphragms for flow control