THE EFFECTIVENESS OF ULTRAVIOLET LIGHTS IN DISINFECTING

USING AN AUTOMATIC DISINFECTION BOX

IMPLEMENTED WITH ARDUINO

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Introduction

- Problem: Pandemic, demand in disinfecting materials.

- Propose solution: The effectiveness of ultraviolet lights in disinfecting using an automatic disinfection box Implemented with Arduino

Statement of the Problem

1. What is the significant difference between uv-based disinfectant and alcohol-based disinfectant in terms of their effectiveness?

2. Is there a significant effect among the different factors listed below in terms of its effectiveness?

a.   Intensity of ultraviolet to be used

b.   Duration time to ultraviolet light exposure

3. How efficient the automatic disinfection box in terms of:

a.   Production cost

b.   Conveniency

Research Paradigm
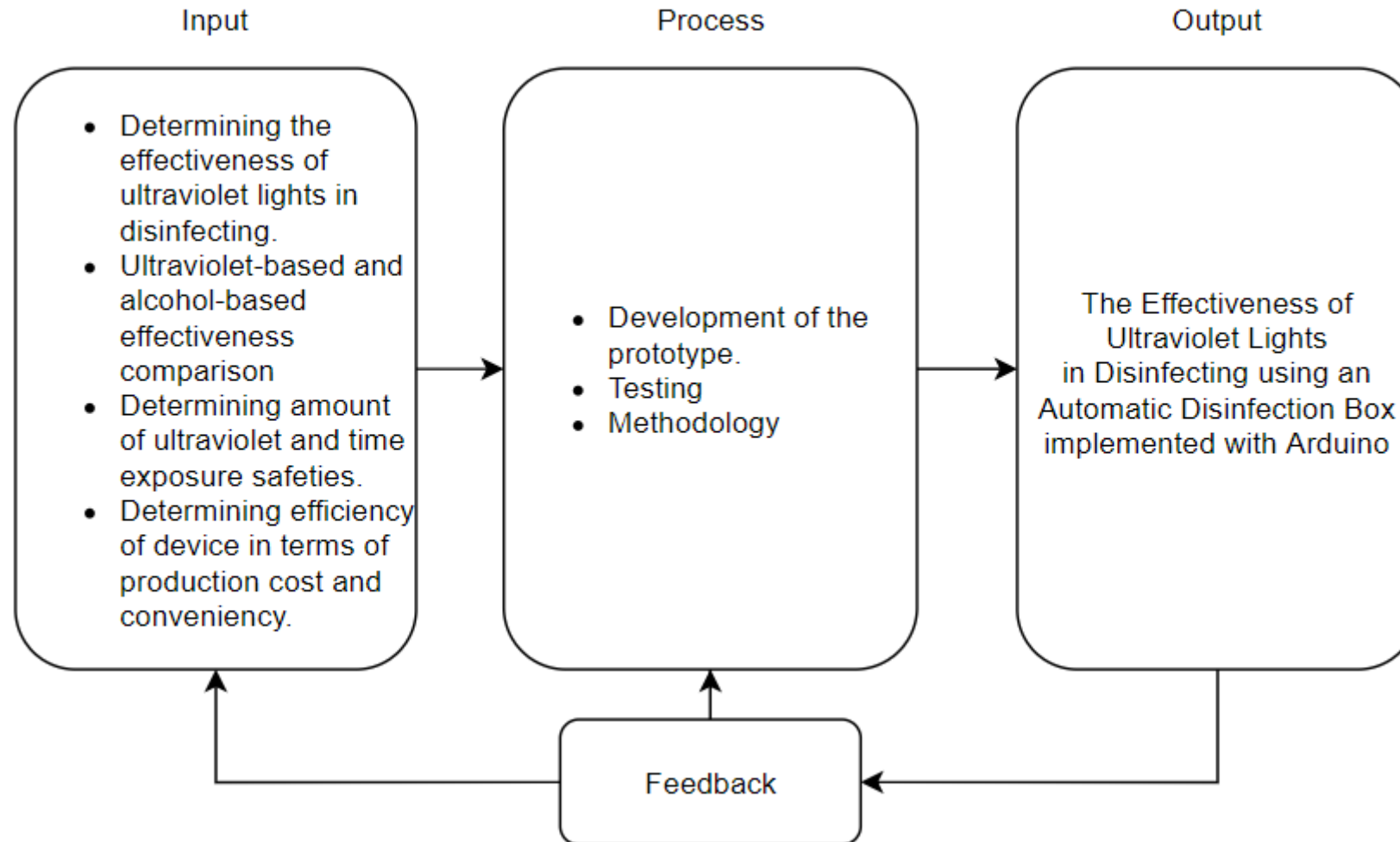
Significance of the Study

1. To health and safety officers - Automated disinfection promotes contactless, safe and good social distancing practice.

2. To the user – Contactless disinfection.

3. To the environment – Less plastic waste residue. reusable.

4. To the future researchers - Serves as good foundation of contactless. automatic and innovative method of disinfection.

Scope and Limitations

- 130L, 100W, 154H cm

- Determining significant difference between ultraviolet-based and alcohol based (70% alcohol content, isopropyl) disinfection

- Determining significant effect in effectiveness in the amount of ultraviolet to be used (222nm, 254nm UVC), time of ultraviolet exposure.

- Determining efficiency of the automatic disinfection box implemented with Arduino in terms of production cost and conveniency.

Scope and Limitations

- Determining the significant difference of uv-based disinfection and specific brands of alcohol.

Research Design

- Quantitative experimental research design: for SOP 1-3a

- Qualitative research design: for SOP 3b

- Method of analysis

a)   T-test

b)   One sample t-test

c)   ANOVA

d)   Likert scale
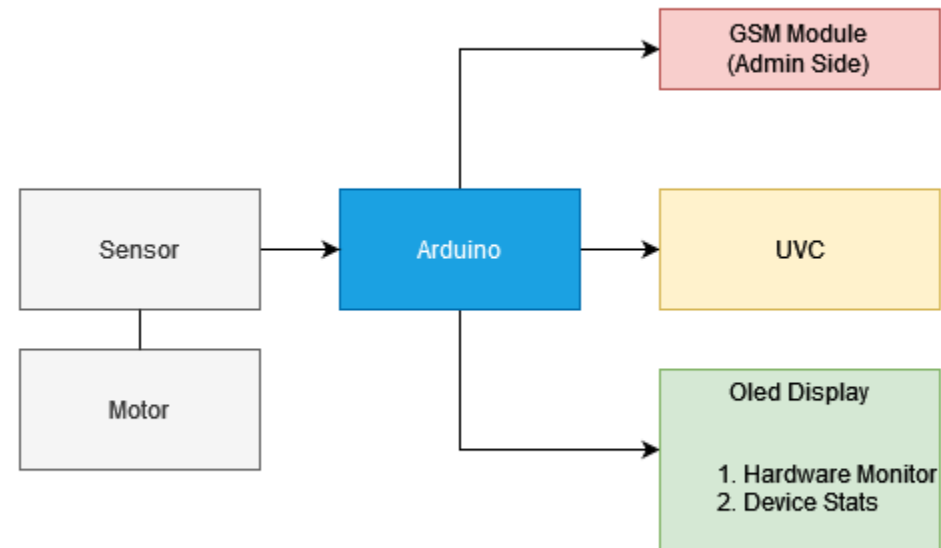
- Tools and methods

Diagrams

Figure 1: Block diagram
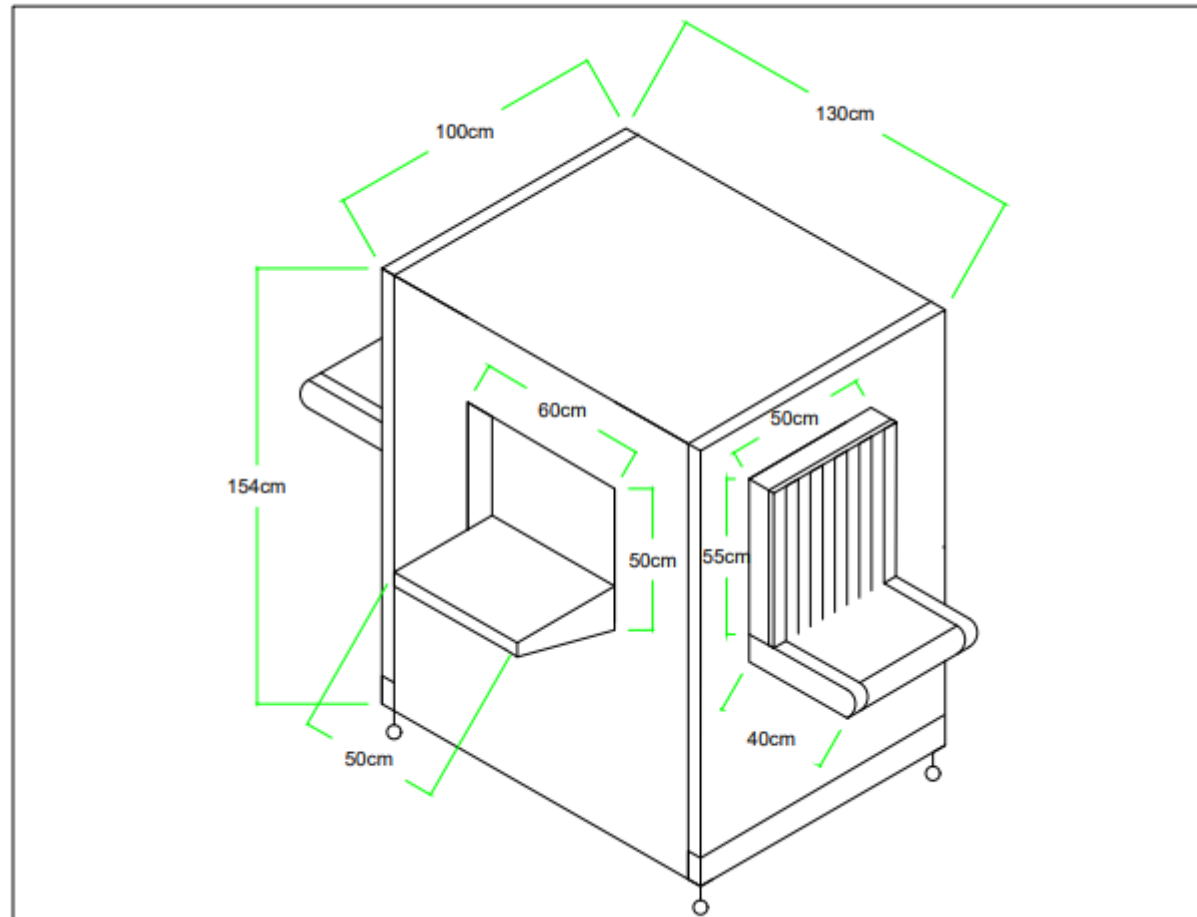
Diagrams

Figure 2: Prototype Design

List of Materials

- Arduino

- UVC

- Resistor

- PIR sensor

- LED display

- GSM module

- Motor

- Wire

- Power supply

- PCB

Circuit Simulation

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