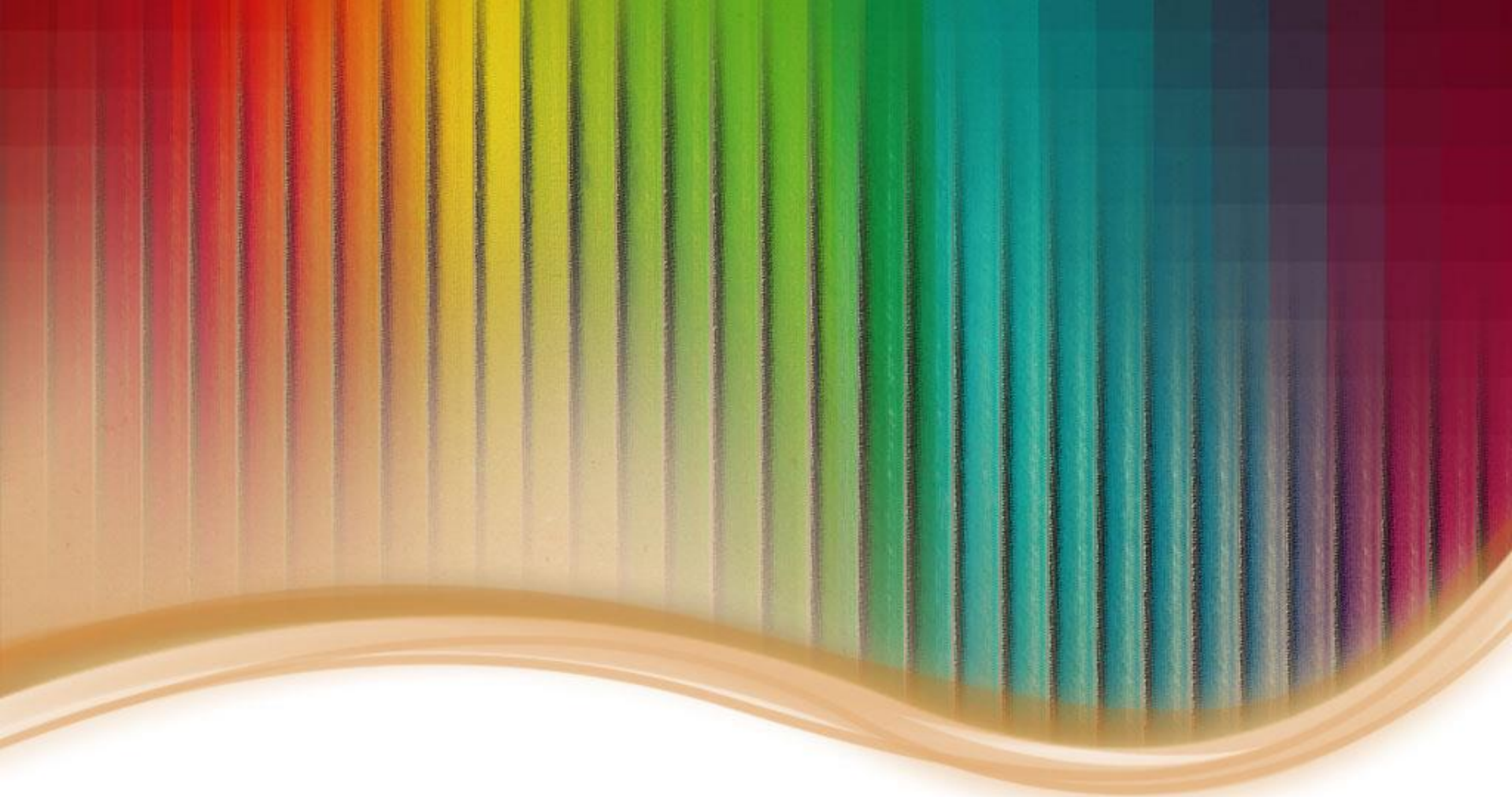


COLOR DETECTION SYSTEM

COE 485 SENIOR PROJECT

- **Ibrahem Al-Turkestani**
- **Faris Al-Baitouni**
- **Mohannad Hakami**

OUTLINE

- INTRODUCTION
- PROBLEM STATEMENT
- PROJECT SPECFICATIONS
- SYSTEM DESIGN
- ISSUES

INTRODUCTION

- **Blindness Worldwide**
  - 39 million are blind
  - 246 million have low vision
  - Total of 285 million people are visually impaired
- **Project Goals** :
  - Improve the life quality of a blind Person
  - Identify colors of clothes, objects like paper money and appreciating art.

PROBLEM STATEMENT

- **Problem:** Inability to detect or distinguish between colors
- **Solution:** Providing a tool to detect colors to help in daily life aspects
- **Impacts:**
  - Opening a new world for a V.I. Person.
  - Increasing social interaction
  - Career improvement

PROJECT SPECFICATIONS

- **User Requirements**
  - Wearable Device
  - Detect Colors
  - Feedback

PROJECT SPECFICATIONS

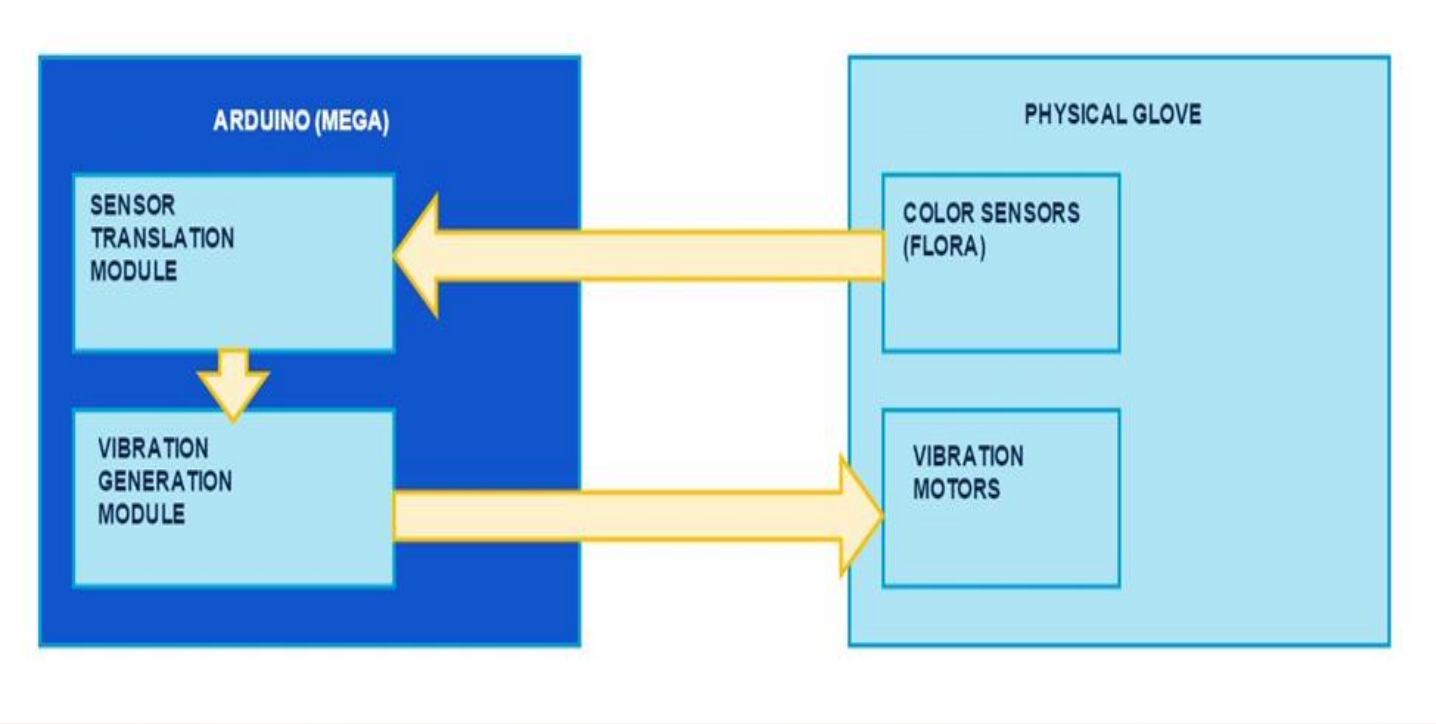
- **Technical Requirements**
  - Wearable Device
    - Lightweight
    - Mobile
    - Flexible
  - Color Detection
    - Can detect up to 255^3 (16581375) Color

PROJECT SPECFICATIONS

- **Technical Requirements**
  - Feedback
    - Unique Representation for 255^3 Color
    - A Clear feedback to the user.

SYSTEM DESIGN

- **System Architecture**



SYSTEM DESIGN

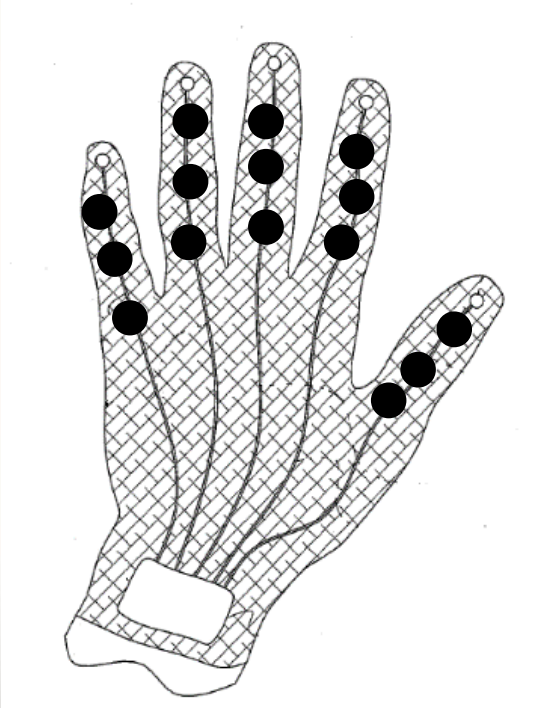
- **Ready-made Components**
  - Flora Sensors
  - Vibration Motors
  - Microcontroller: Arduino Mega 2560

SYSTEM DESIGN

- **Custom Component:**
  - Gloves as Wearable device.
  - Software Components:
    - Sensor translator module
    - Vibration generator module

Design and Implementation

- Glove design: Built to hold three vibrators and one sensor on each finger

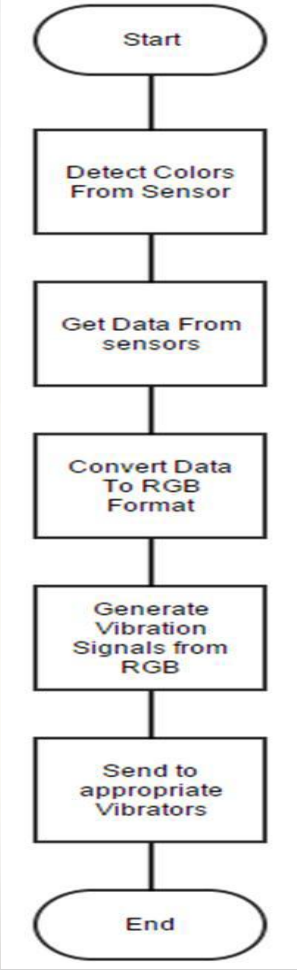


Design and Implementation

Design and Implementation

Design and Implementation

- Software component:

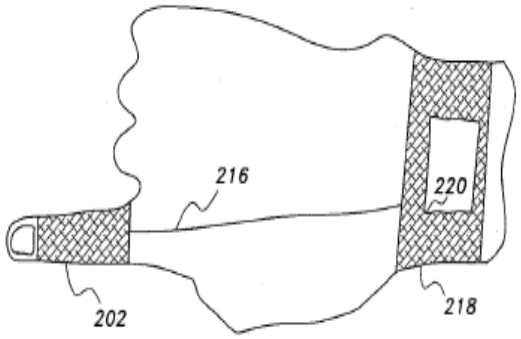


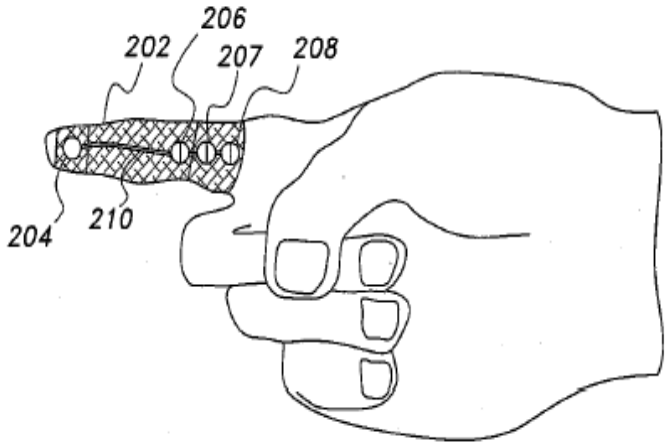
Component Decisions

Part required	Targeted Criteria	Option1	Option2	Option 3	Preferred one	Main reasons
processor	Ability to handle data and generates appropriate signal after processing for the output	Arduino uno	raspberry PI	Arduino Mega	Arduino Mega	Provides enough in/out pins. Easy to program (in C), efficient in meeting the needs.
Color Sensor	Size limited by the average finger size, ability to recognize the colors immediately and uses RGB module.	Flora color Sensors	Color Sensor/TCS3200D/RGB Module	TCS3200 Color Sensor RGB Module	Flora Color Sensor	It meets the targeted criteria perfectly. Others are not arduino compatible
Vibration motors	Smaller than a finger tip and has a vibration intensity range.	Grove vibration motor	Aslong A1234 Flat Vibration Motor	vibration motor module 310-101	vibration motor module 310-101	Perfectly meets the targeted criteria and easier to purchase.

System Design Decisions

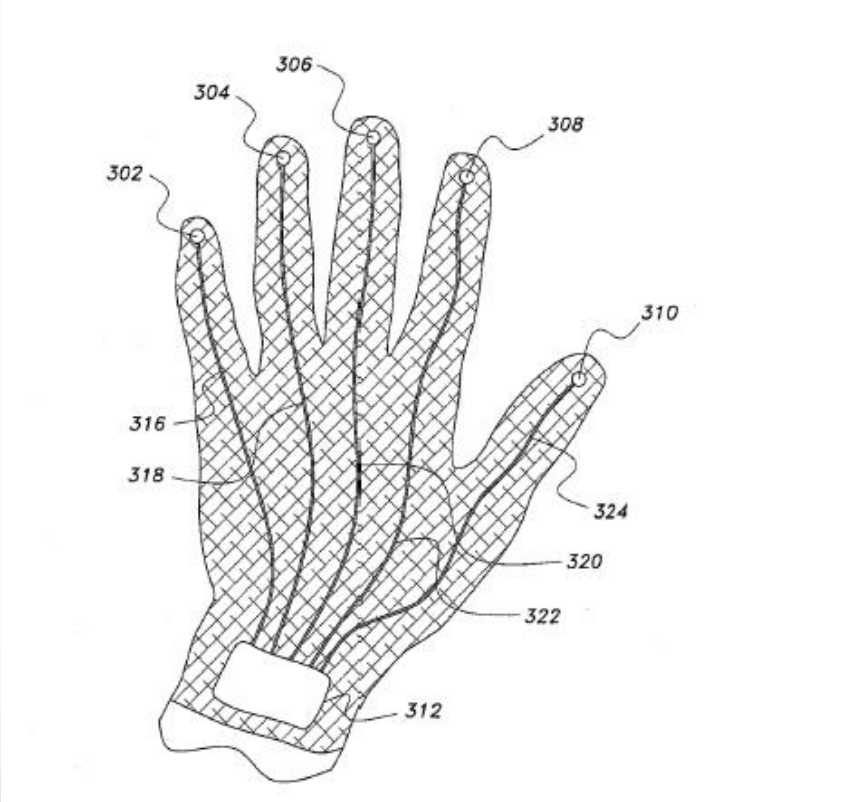
Option 1:





System Design Decisions

Option 2:



ISSUES

- **Making the glove**
- **Programming the control unit components**
- **Working with multiple Flora color sensors**