**PCET’s**

***PimpriChinchwad College of Engineering,***

**Nigdi, Pune-44**



**Department of Electronics & Telecommunication**

**PBL VSynopsis**

**Year 2023–2024**

**Sem-V**

**Project Synopsis**

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| **1. Mini Project Topic / Title:** |
| Finalized Title of PBL V :  **Automatic Clothes Segregator** |

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| **2. Details of Group Member:** | | | | | |
| **PRN No.** | **Class** | **Division** | **Name of Student** | **Mobile Number** | **Email Id** |
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| **3. Project Overview / Background:** |
| * **Need of Work / Reason for selection of this project:**   A lot of people waste time and energy on sorting clothes every time while using a washer.  Issues like color fading, color bleeding occurs which stirs up unnecessary trouble.  Along with this, need to separately wash white or colored clothes which leads to water and electricity wastage with manual labor.   * **Objectives:**  1. To sort clothes according to color. 2. Design a fully automated system to sort clothes. 3. Research about ways to implement it in normal washers/washing machines.  * **Problem Statement (explain what you want to implement in this project in short sentence:**   Sorting clothes according to their color becomes a hassle everytime we put them in a washer.  By using this Automated Clothes Segregator, one can pile up all their clothes irrespective of their color and put them in the segregator instead of sorting them manually.  This will save a lot of time and energy of people.   * **Which Reengineering Concept is Incepted**:   The project re-engineers the garment sorting process by automating it using TCS3200 color sensors, reducing the need for manual labor and enhancing efficiency, accuracy, and garment care.   * **Benefits to the surrounding/society:**   Aim is to design an upright washing machine that can sort and wash all your clothes together – regardless of color. That means no more extra sorting, no more color bleeding and no excess water usage!  Ideal for people who want to pile all their clothes into the washer without having to worry about sorting out colors or fabrics first  Will save time and energy required to sort the clothes. |

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| **4. Methodology:** |
| * **Proposed Techniques or methods to be implemented:**   Using a Color Sensor to detect color of the cloth and send it to the respective compartment after color detection using servo motors mechanism.   * **Project Flowchart:**      * **Circuit Diagram:**   **C:\Users\Guesr Account\Downloads\WhatsApp Image 2023-10-26 at 7.41.07 PM.jpeg**   * **Advantages:**  1. Color Preservation: Preventing color fading and bleeding in clothes helps maintain the quality and appearance of garments over time, ensuring customer satisfaction. 2. Non-Invasive Sorting: TCS3200 sensors are non-contact and gentle on the clothes, avoiding any physical damage or contamination during the sorting process. 3. High Accuracy: TCS3200 sensors are capable of accurate color detection, reducing the chances of misclassification and errors. 4. Efficiency: Automating the sorting process with these sensors can significantly increase the speed and efficiency of garment sorting. 5. Customization: You can easily customize the color detection thresholds and sorting criteria to meet specific needs, such as sorting clothes by shade or fabric type. 6. Reduced Labor Costs: Automated sorting machines can reduce the need for manual sorting, saving on labor costs.  * **Limitations:**  1. Limited Color Range: TCS3200 sensors may struggle to differentiate extremely similar shades, leading to misclassification. 2. Light Sensitivity: Variations in ambient lighting can affect the sensor's accuracy. Controlled lighting may be required. 3. Calibration Challenges: Accurate calibration is essential for precise color detection and requires ongoing maintenance. 4. Environmental Factors: Dust and dirt can affect the sensor's performance, necessitating regular cleaning and maintenance. 5. Material Compatibility: TCS3200 sensors work best with solid-colored or opaque materials. They may not be ideal for sorting transparent or highly reflective fabrics.  * **Future Scope:**  1. Machine Learning Integration: Incorporating machine learning algorithms can enhance the accuracy of color detection, especially for subtle color variations. Deep learning models can be trained to recognize a wider range of colors and patterns. 2. Multi-Sensor Fusion: Combining TCS3200 sensors with other sensor types, such as infrared sensors or computer vision systems, can improve overall garment sorting accuracy. 3. Wearable Tech Integration: Future applications could involve integrating color detection technology into wearable devices, allowing users to check and sort their clothing with ease. 4. Smart Home Integration: Integration with smart home systems can enable automated garment sorting and care instructions based on color, fabric type, and garment care labels  * **Applications**:  1. In Washing machines 2. Laundry 3. In industries based on color Sorting 4. In Textile industry |

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| **5. Project requirements:** |
| * **Equipment:**  1. TCS230 TCS3200 Color Sensor 2. Arduino Nano 3. Servo Motor 4. Switch 5. Power Jack  * **Facilities required:**  1. Proteus 2. Arduino IDE 3. 0 PCB perf board 4. Soldering iron  * **Budget :**  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Sr. no.** | **Component Name** | **Quantity** | | **Cost(in rupees)** | | **1** | SG 90 Servo motor | 2 | | 220/- | | **2** | Power Jack | 1 | | 20/- | | **3** | Switch | 1 | | 10/- | | **4** | Arduino Nano | 1 | | 230/- | | **5** | TCS3200 | 1 | | 520/- | | **6** | Foam Board (2ft \* 2ft) | 1 | | 150/- | |  | **Total** |  | **1150/-** | | |
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| **6. References:** |
| * <https://www.elecrow.com/wiki/index.php?title=TCS3200_Colour_Sensor_Module#:~:text=TCS3200%20converts%20the%20intensity%20of,is%20available%20in%20single%20line> * <https://www.researchgate.net/publication/360146509_Development_of_Arduino_Uno-Based_TCS3200_Color_Sensor_and_Its_Application_on_the_Determination_of_Rhodamine_B_Level_in_Syrup> * <https://www.researchgate.net/publication/341161348_Design_and_Development_of_Product_Sorter_Using_TSC3200_Color_Sensor> * <https://www.researchgate.net/publication/340264241_Prediction_of_Nutrients_N_P_K_in_soil_using_Color_Sensor_TCS3200> |

**Signature of PBL-VGuide: Dr. Rashmi V. Patil**

**Signature of PBL Mentor: Dr. Deepti Khurge**