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Quality Controller and Notification System for Chemical Manufacturing Plant

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Abstract - *In recent years there has been rapid development in automation which has made human life easier in several aspects. In manufacturing plant certain chemicals are mixed in a specific proportion and heated to certain degrees of temperature, thus automation is required for human safety in chemical industry. The proposed system is introduced to reduce the components loss and human efforts by using Quality controller and notification system. It improves the accuracy of components. In existing system we don't get exact quality of chemical component. To overcome this problem continuous monitoring of the components is required. Camera is used for continuous monitoring it set to the particular region. Particular color value is stored in database. In this system pattern matching algorithm is used to detect the stored color value. If stored value and present value do not match at that time DC motor stop the conveyer belt and also quick Alert generation will takes place and notification is send to respected person by using API package and buzzer is used for send notification. The additional advantage of this system is continuous monitoring of present color value of component at particular region using camera and reduces the product loss. Arduino is used to monitoring the all system.*

Keywords: ***Alert generation, API Package, Arduino, Buzzer, Camera, Conveyer belt, Database, DC motor, Pattern matching.***

1. INTRODUCTION

Quality control of process materials is critical to success of any manufacturing facility

Automating the routing task in the industries increases the productivity and reduces the probability of error in product. Traditional industries involve the manual operation of machines which cause error in product, it is also time consuming and expensive. Automation is nothing but reducing a human work as much as possible. Mixing of chemical is common process in chemical industry, medical industry, pharmaceutical industry etc. The most important step in mixing chemical is that the accurate proportion of chemical element which can accurately performed the product. In existing system automatic chemical level controller is designed to monitor and control liquid in bottle with aim to prevent industrial accident due to overflow of bottle. Automated chemical mixer perform role of mixing different liquid in equal proportions. Automated chemical mixing system is application used in paint industry for creation of different color shades from basic colors. There are many existing systems used in chemical industry that check the quality but not monitor the components. In proposed system machine learning is used that reduced the efforts and improve the performance.

1.1 Literature survey

This system based on a holistic approach used to monitoring particles in ultra-pure chemicals from supplier all the way to the wafer surface. Using holistic approach and wafer surface it is possible to measure liquid particle counts of similar dimensions to wafer particle metrology. Two particle counters are installed in this system one particle counter is used for measures the liquid particle counts in the chemical. This two particle counters are installed in the gap between our supplier certificate of analysis (COA) and wafer level defects [1]. The system of bottle filling is automated. This system is proposed because the manual handling is time-consuming. PLC based automated liquid mixing and bottle filling system is designed to automate the control and mixing of two different liquids in predefined proportion and fill in the bottle to achieve the quality control. Two DC motors are used for two reservoir tanks. IR sensors are used to sense the bottle is empty or not [2]. Products sorting process is a very difficult in industry. Continuous manual sorting of product creates issues. Working of this paper describe prototype designed for automatic sorting of objects based on the color. Detect the color of the product using TCS230 sensor and the PIC16F628A microcontroller is used to control overall process. The system developed a sorting machine using PIC for automatic color sorting, taking in to consideration three colors [3].

1.2 Objectives

- To reduce human effort and labor cost.
- Maintain the desired level of quality in product.
- To improve the companies income by making the production more acceptable to customers.
- To produce optimal quality at reduced price.

2. System Architecture

The proposed system is introduced to quality control and notification system. The chemical Components are put at various locations on conveyer belt the components mixing is takes place at some constant proportion. If this proportion is not match to certain value then whole mixture is rejected. Resulting in great loss, to avoid this continuous monitoring is done by using camera. Camera is set to particular region by using region extraction we get particular region. The quality checking and color detection is done by pattern matching

algorithm which interfaced with desktop or android application. The proposed system is made such that it detects the color of Component in chemical industry. When the color of component will not match then alert Notification is send to respected persons. By using pattern matching algorithm we match the color of two mixtures. Accuracy levels of color are stored in database.

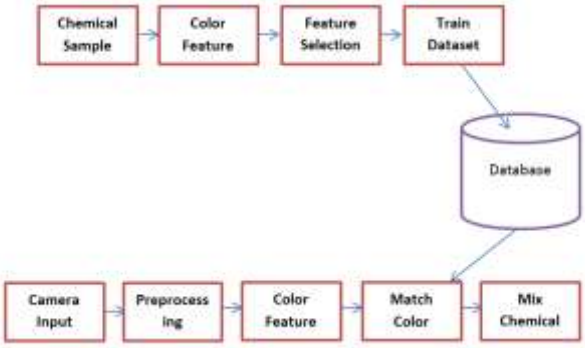

Figure 2.1 System architecture

3. CONCLUSIONS

The efficient algorithms are used to design the modules. The proposed system will be a smart and intelligent system that will monitor, analyze and will take decision according to the steps mention in proposed system the performance of proposed system is more associated with correct training set and classification method, the feature of object are identified and determined for training the classifier.

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