

FINAL YEAR PROJECT REPORT

VISUAL INSPECTION OF A PRODUCT FOR AUTOMOBILE INDUSTRY

In fulfillment of the requirement for degree of Bachelors in Computer Engineering (BCE)

By

MUHAMMAD SALMAN NIMRA ZAHEER JAWERIA JAMSHED KHAN 57480 57492 57472

SUPERVISED BY ENGR.NAVEERA SAMI

BAHRIA UNIVERSITY (KARACHI CAMPUS)
2018-2022



Intellectual Property Right Declaration

This is to declare that the work done under the supervision of Engr. Naveera Sami having title "Visual Inspection Of A Product For Automobile Industry" carried out in partial fulfillment of the requirements of Bachelors of Engineering in Computer Engineering, is the sole property of Bahria University and is protected under the Intellectual Property right laws and conventions. Bahira University asserts legal and beneficial ownership rights over all Intellectual Property developed as a result of support either directly from or channeled through Bahria University, or created at the request or direction of Bahira University, or developed as a result of utilization of Bahira University Resources including copyright in any material. It can only be considered/ used for purposes like extension for further enhancement, product development, adoption for commercial/organizational usage, etc., with the permission of the university and in adherence to its policies.

The above statements apply to all students and faculty members.

Date: 2 Aug | 2022

Author(s):

Name: Muhammad Salman

Name: Nimra Zaheer

Name: Jaweria Jamshed Khan

Supervisor(s):

Name: Naveera Sami

Signature: 2

Signature: Mines

Signature:

Signature:

Bahria University
Discovering Knowledge

Anti-Plagiarism Declaration

This is to declare that the above publication produced under the supervision of Engr. Naveera Sami having title "Visual Inspection Of A Product For Automobile Industry" is the sole contribution of the author(s) and no part hereof has been reproduced illegally (cut and paste) which can be considered as Plagiarism. All referenced parts have been used to argue the idea and have been cited properly. I/We will be responsible and liable for any consequence if violation of this declaration is proven.

Date: 2 Aug | 2022

Author(s):

Name: Muhammad Salman

Name: Nimra Zaheer

Name: Jaweria Jamshed Khan

Signature:

Signature:

Signature:

Acknowledgments

We would like to thank Allah Almighty; with His blessings we have come this far. We are over helmed in all humbleness and gratefulness to acknowledge all those who have helped us put these ideas. The completion of this undertaking could not be possible without the participation of many people. Their contributions are sincerely and gratefully appreciated.

We would like to acknowledge the sincere efforts and valuable time given by our supervisor, Engr. Naveera Sami for supporting and guiding us throughout the project. Our friends and family for supporting us during the process.

Abstract

Visual inspection is the most used method for quality control. It is used to observe the surface of an object and look for cracks, scratches and other physical defects. This technology aims to reduce the need for human intervention for inspection in large-scale factories. Through assessment frameworks, recognizing imperfections, abnormalities and other assembling defects can be efficiently distinguished. These examination frameworks are outfitted with a camera with video and lighting. This framework can get the information that assists with further developing productivity in assembling lines, arranging, pressing and different applications. Moreover, the data can recognize issues with assembling line or other capability in work to improve effectiveness, stop incapable cycles, figure out unsatisfactory items. From Google search by image to complex industrial systems—machine vision is making lives easier. And it's possible that very soon visual quality inspection tasks will be mostly machine-based, allowing humans to focus on more sophisticated tasks. The efficiency and productivity of global manufacturers will go to a new level because of deep learning and Computer vision.

Table of Contents

1. INTRODUCTION	1
1.1 Background	1
1.2 Purpose of this project	2
1.3 Complex Engineering Problem Statement	2
1.4 Objectives of the Project	2
1.5 Scope of the Project	3
1.6 Report Structure	3
2. BACKGROUND AND LITERATURE REVIEW	5
2.1 Related Work	5
3. SYSTEM ANALYSIS	
3.1 Hardware Requiements	7
3.2 Software Requirements	
3.3 Web Application	16
3.4 Work Breakdown Structure	
3.5 Data Flow Diagram	20
3.5 System Requirements	21
4. SYSTEM DESIGN	23
4.1 User Case Diagram	23
4.2 Sequence Diagram	24
4.3 Class Diagram	
4.4 Gantt Chart	26
5. IMPLEMENTATION	
5.1 Raspberry Pie Setup for Open Cv and Python 3.9	27
5.2 Code Detail	30
6. TESTING	32
7. RESULTS AND DISCUSSSION	36
8. CONCLUSIONS AND FUTURE WORK	39
BIBLIOGRAPHY	40