

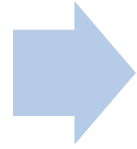
My understanding of INTP23-ML-9

Piston Defect Detection Using Computer Vision

Piston Defect Detection is one of the most important aspects of production. With the rise of piston demands for safety , they demand for higher quality components is rising.This is where Computer Vision can provide an efficient alternative for commercial automated optical inspection to assist small scale manufacturers to do an automated inspection.

9 June

- Problem Statement
- Basic Libraries
- Computer Vision



10 June

- OpenCV Tutorial
- Researched Paper about this
- Explained Computer Vision



11 June

- Pytorch Frameworks
 - OpenCV tutorial
- Image Enhancement

Week 1:

Whats happening this week:

- OpenCV Learning
- Basic Libraries Understanding
- Identifying different types of defects in piston
- Understanding the problem Statement

My Understanding:

Project Definition: To develop an automated system that utilizes computer vision techniques to detect defects in pistons during the manufacturing process. By analyzing images of pistons, the system will identify various types of defects, such as scratches, cracks, or abnormal shapes, enabling early detection and reducing the likelihood of faulty pistons reaching the market. This project will contribute to improving the quality control processes and overall efficiency of piston manufacturing.

Understanding: The goal of the research is to develop a computerised system that can automatically check for and find piston manufacturing problems. This system will use computer vision techniques to look for any indications of flaws in photographs of pistons by analysing and interpreting digital images or videos. Images of pistons will be recorded using cameras or other imaging equipment during the production process. The automated system will then process these photographs and analyse the visual data using cutting-edge algorithms and methods. The automated system for flaw detection in pistons that uses computer vision techniques will boost quality control procedures, reduce the output of defective pistons, and increase manufacturing efficiency all around.

Approach:

After using multiple images we can classify images as defect images and without it this can be done by image processing and classifies by computer vision.

Weekly Progress:

Day1 – 9th June

Learnings:

- Understood the problem statement.
- Started learning about OpenCV by taking a course in it.
- Understood how to make changes in an image and change its colour dimension.
- Learned basic image manipulation , enhancement.

Day 2- 10 June of IITD-FSM Learned more about Open CV and its use.

- OpenCV tutorials
- searched and read paper on this field
- Read 2 papers
- Applied displaying and applied filters in images.
- Explored more about computer vision in this field

Day 3 – 11th June

- Learned Pandas and SciKit Library
- Pandas was completed
- Scikit still in process

Trying to figure out use of pandas and scikit in this and implementing it.

Defect Images:



[illegible]