To,

IITD-AIA Foundation on Smart Manufacturing

Subject: Weekly Progress Report for Week-3

Respected sir,

Following is the required progress report to the best of my knowledge considering relevant topics to be covered:

1.image processing, feature extraction, and machine learning

2.image processing fundamentals and techniques, such as image filtering, thresholding

3.feature extraction methods like scale-invariant feature transform and speeded up robust features

4.I explored different ML algorithms suitable for defect detection, such as convolutional neural networks and support vector machines

5.I explored libraries and frameworks, such as OpenCV and TensorFlow

Day 21;

I began my journey by diving into the world of computer vision techniques and algorithms commonly used for defect detection in industrial settings.

I explored concepts such as image processing, feature extraction, and machine learning, which are fundamental to this project.

Challenges:

It required careful selection of reliable resources and investing time to grasp complex concepts..

Day 22:

I focused on studying image processing fundamentals and techniques, such as image filtering, thresholding, and edge detection. Image processing plays a crucial role in enhancing the quality of input images, removing noise, and extracting important features that can aid in defect detection.

Challenges:

Mastering image processing techniques presented challenges, as it involved mathematical concepts and implementing complex algorithms.

Day 23:

Learned about feature extraction methods like scale-invariant feature transform and speeded up robust features. These methods are vital for detecting defects by identifying distinctive patterns or keypoints in images that can be used for comparison and matching.

Challenges:

Feature extraction methods often involve complex algorithms and mathematical concepts. Implementing these methods accurately and efficiently required attention to detail.

Day 24:

I explored different ML algorithms suitable for defect detection, such as convolutional neural networks and support vector machines . Machine learning algorithms can learn patterns and anomalies from labeled training data to accurately classify defects.

Challenges:

Understanding ML algorithms required a strong foundation in mathematics and statistics. Proper selection and tuning of algorithms for defect detection was essential but challenging.

Day 25:

Famlirized my self with libraries and frameworks, such as OpenCV and TensorFlow. These libraries provided a set of pre-implemented functions and tools for various computer vision tasks, enabling efficient development and implementation of the defect detection system.

Challenges:.

Integrating these libraries into the development environment and dealing with potential compatibility issues posed additional challenges.