

FSM Mid-Internship Review FSM



Piston Defect Detection Using Computer Vision

Intern Name: Nandan Vaid

Institute Name: Galgotias University

Under Mentorship of

Mr. Keivalya

IITD-AIA FOUNDATION FOR SMART MANUFACTURING



Obectives - Achieved



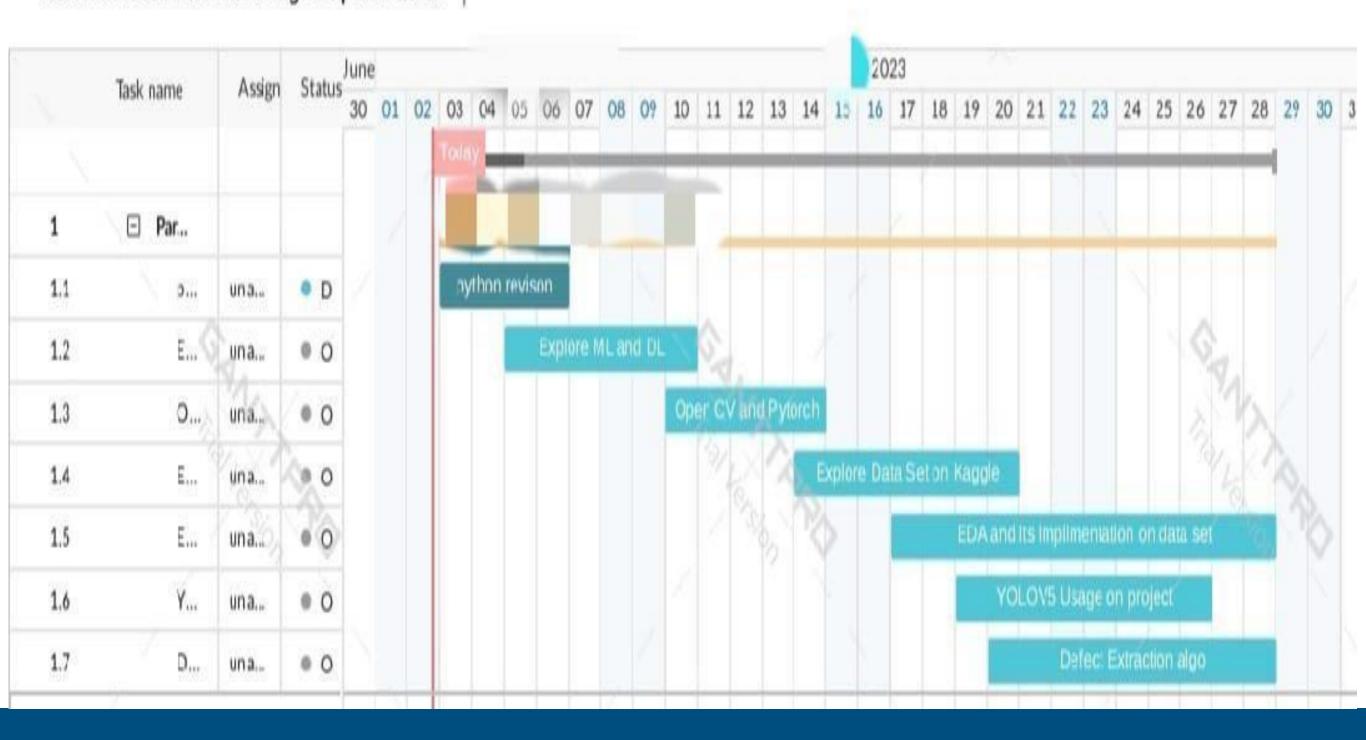
- 1-2). Done Revision of Python 3
- 3-4) . ML Topics Gone through Supervised , Unsupervised & Reinforced
- 5-6). Deep learning topics.
- 7-8). Learn about sequence modeling
- 9-10). Detail about computer vision
- 11-12). Learned about computer vision algorithms
- 13-14) . Learned open cv
- 15-17) . Learned about Py torch
- 18-19). Project Exploration (Understand Requirement of the project)
- 20-21). Explore data set on Kaggle
- 22-25) . Explore about YOLOV5
- 26-27. Eda and its implementation on data set
- 28-29. Explore about Defect extraction algorithm.
- 29-30). Explore ml algo sutable for defect detection such as CNN



Timeline - Gantt chart



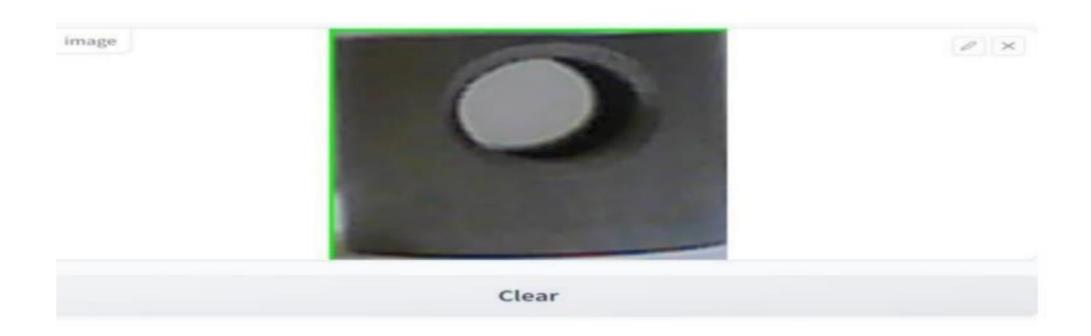
Piston defect detection using computer vision





Screenshot of development FSMID

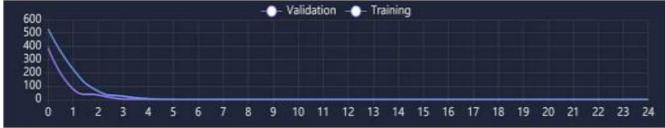




Accuracy plot:



Loss Plot:









```
from tensorflow.keras.models import load model
    from tensorflow.keras.preprocessing import image
    import numpy as np
   # Load and preprocess the sample image
    sample_image_path = '/content/drive/MyDrive/xyz/Normal/kumda_componentN10.png'
    img = image.load img(sample image path, target size=(80, 80))
    img_array = image.img_to_array(img)
    img array = np.expand dims(img array, axis=0)
   preprocessed_img = img array / 255.0 # Normalize the pixel values
   # Make predictions
   predictions = model.predict(preprocessed img)
   # Interpret the prediction results
    class_labels = ['defactive1', 'defactive2', 'normal']
   predicted class index = np.argmax(predictions)
    predicted class label = class labels[predicted class index]
    confidence = predictions[0][predicted_class_index]
   print("Predicted Class:", predicted class label)
   print("Confidence:", confidence)
Predicted Class: normal
   Confidence: 0.5174713
```

Thank You

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