STEEL DEFECT DETECTION USING COMPUTER VISION

PHASE-1 REPORT

Submitted by:

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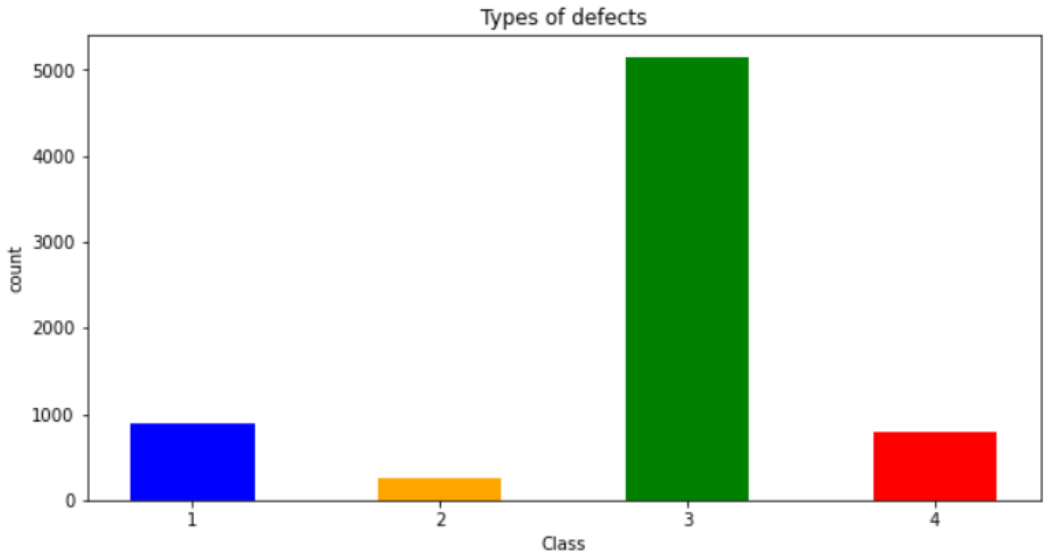
PHASE-1 OBJECTIVE

1. **Understanding the given Dataset**
2. **Performing Exploratory Data analysis**
3. **Drawing Conclusion from the performed EDA**
4. **Based on the conclusion deciding the model to be used in Phase-2**

DELIVERABLES

- The very first step to get started in this Project is understanding the dataset which means what is the data that has been provided and what is the purpose of each folder in it.
- Hence, I took 1 complete day in completely understanding the given dataset.
- After which I started doing Exploratory data analysis.
- In EDA part, initially imported few Basic and mandatory Libraries to start visualizing the data.
- Then loaded the train.csv file onto the IDE and analyzed top 10 and bottom 10 entries.
- Then I checked is there any NULL/missing values and found out there were none.
- Next, it has been found that there are totally 4 different classes of defects in the given dataset. Hence counted and categorized each defect class type.
- And found out there were:
    - 897 images with defect class 1
    - 247 images with defect class 2
    - 5150 images with defect class 3
    - 801 images with defect class 4
- So, from above data it is clear that Defect class 3 is majorly occurring defect and class 2 being the least. Hence there is a class imbalance.

DELIVERABLES continued...



- Next it has been found that in the same image there were multiple defects, therefore identified number of images having only 1 defect type and multiple defect type, and it has been found that:
    - 6239 images have only 1 class defect type
    - 425 images have 2 class defect type
    - In rare case there were very less images having 3 classes defect type.
- Then I found out the size of each image and concluded that every image is of size 256x1600. And there were totally 12,568 training images which is used to train a model and 5506 images which is used to test a model.

DELIVERABLES continued...

- Later wrote a code to convert RLE to mask and visualized mask with random images.
- For the sake of simplicity each class type has been realized using color Palette which is provided below:

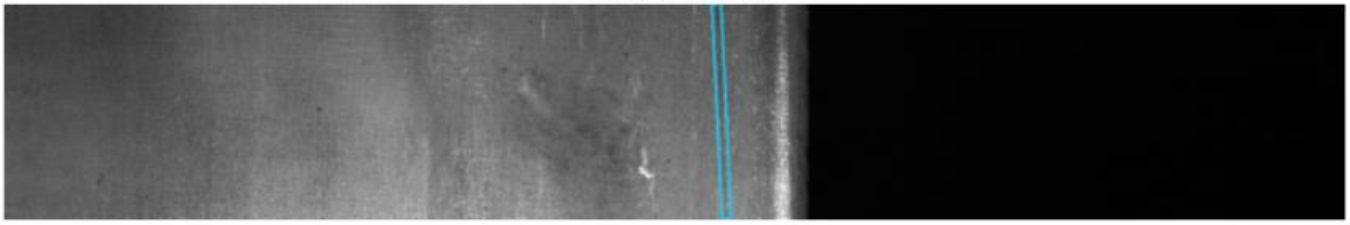
- Then to check the proper working of the mask, I visualized few random images from each class type and worked as expected. It could able to identify the region in the given image and encircled the defective part using EncodedPixel. Few sample images given below:

fed07ccf3.jpg

ff001adfe.jpg

ff6e35e0a.jpg

fcd374576.jpg



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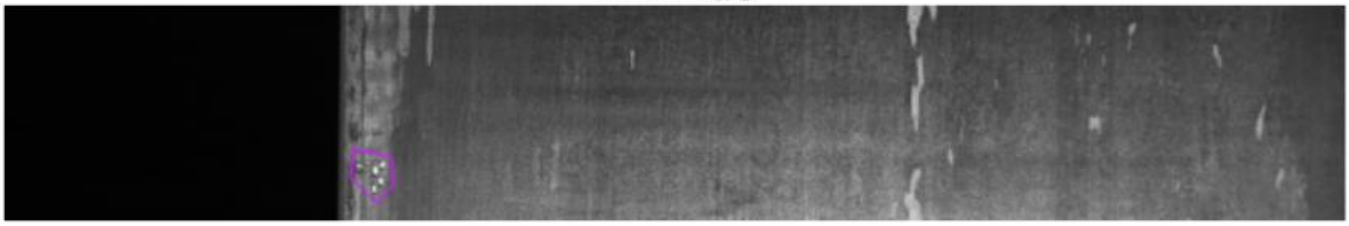

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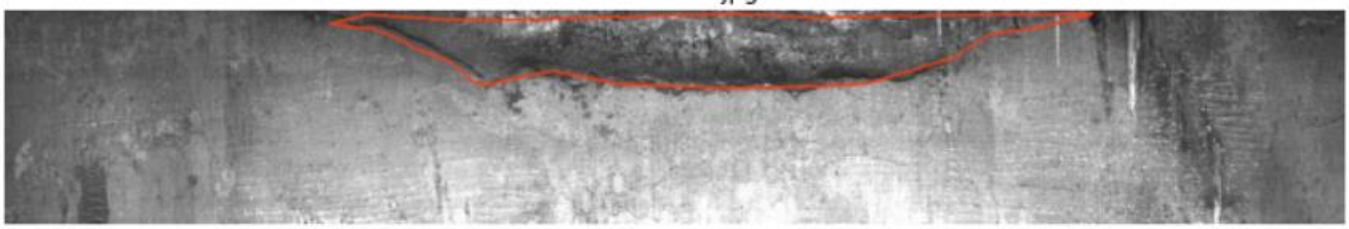
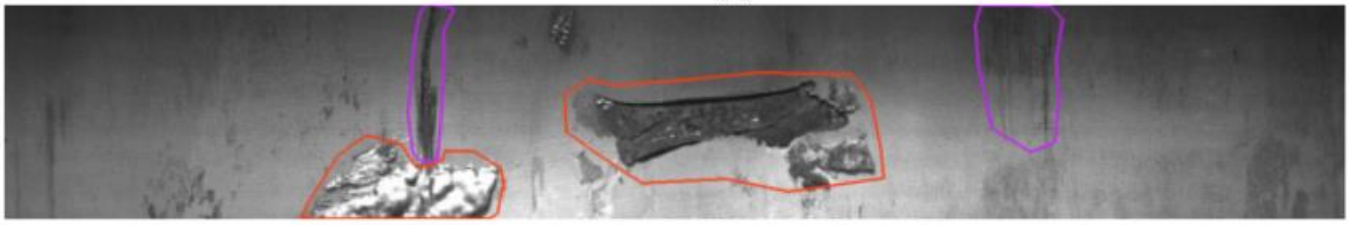
ffffd67df.jpg

feec56162.jpg



ff6bfada2.jpg



ff9d46e95.jpg