

Steel Defect Detection

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The goal of this project is to classify and detect defects on steel sheets based on image input. We breakdown our project into 3 components such as, identify whether an input image has a defect or not, Identify the number of types of defects an image contains and for each defect type, identify regions of the image that has this defect. The first task is a binary classification with 0 for no defect and 1 for defects. The second task belongs to a multi-class classification problem, where each image can have up to 4 types of defects corresponding to classes [1,2,3,4]. For the final task, the defect detection will be done using image segmentation where each pixel is labeled as having no defect or a defect of a particular type. We would be using convnet architectures like CNN and ResNets for the classification task and U-net for defect detection.

This was a Kaggle challenge and the link to the dataset is

<https://www.kaggle.com/c/severstal-steel-defect-detection/data>

The dataset is of size ~2GB and consists of 18076 images of which, 12568 images in the train set and 5506 images in the test set. Of the training 12568 images, only 7095 images have defects, rest have no defects. Each image is of size 1600*256. The location of the defects we given as encoded pixels. We have to decode them using a mask function to get the defect location. Since the data is less to train a neural network, we will be trying data augmentation techniques to expand the dataset.