Ship Detection using Satellite Imagery

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Project Goals

- I propose two models that seek to **automate** the detection of ships in satellite images

    1. **Identifying images that contain ships and those that do not**

    2. **Detecting and delineating each ship from its background**

- Using satellite imagery, in conjunction with traditional AIS monitoring, stakeholders can benefit from a **clearer**, more **complete picture** of the seas

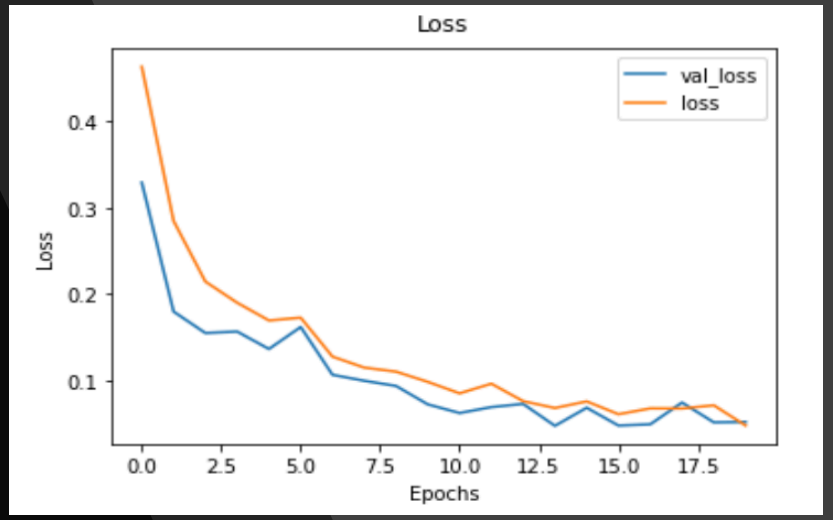
Part I :
Our Data

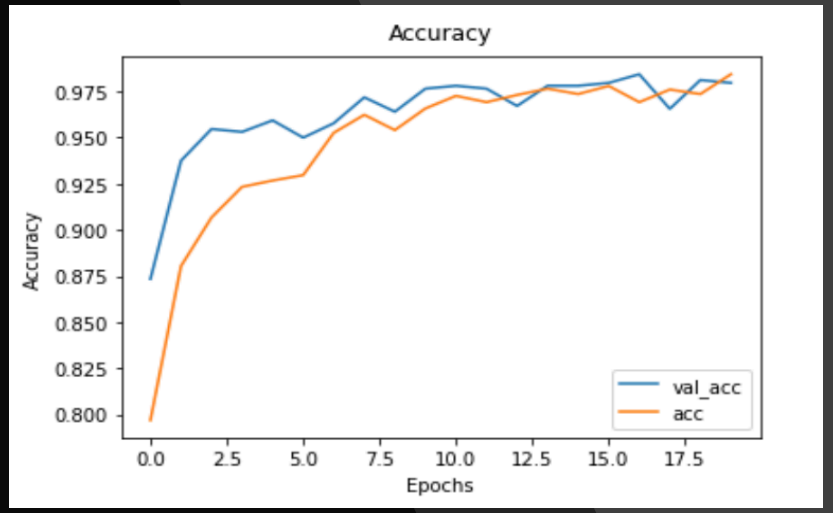
Contains ship

Contains no ship

Ship Image Classification: Part I

- Using 4000+ images
- Baseline model: Decision Tree Classifier
  - Validation accuracy: 86.25%
- Final model: Convolutional Neural Network
  - Validation accuracy: 97.9%
  - Test accuracy: 97.8%

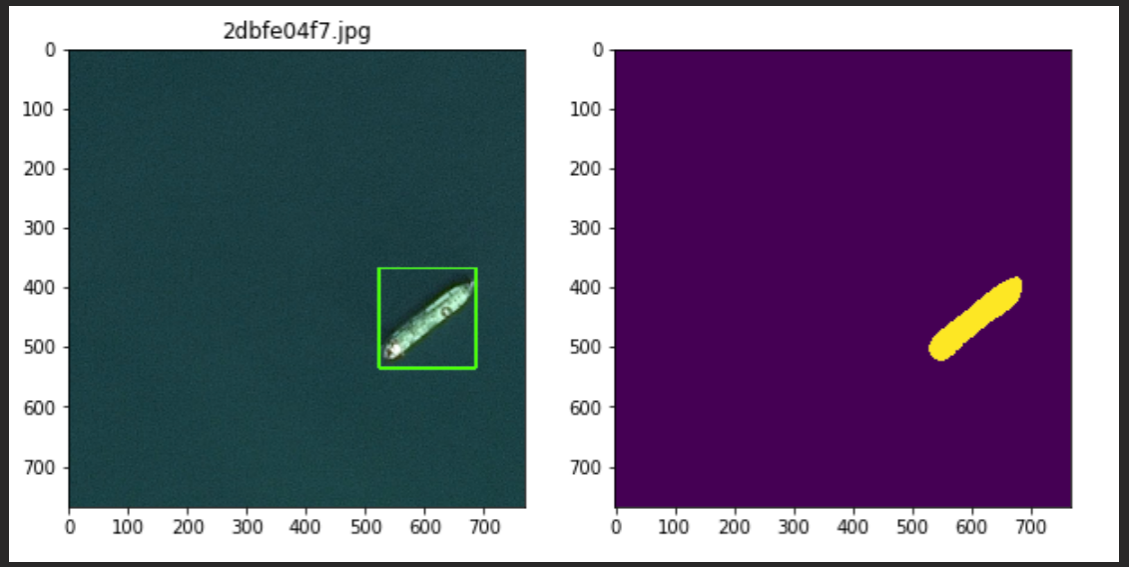


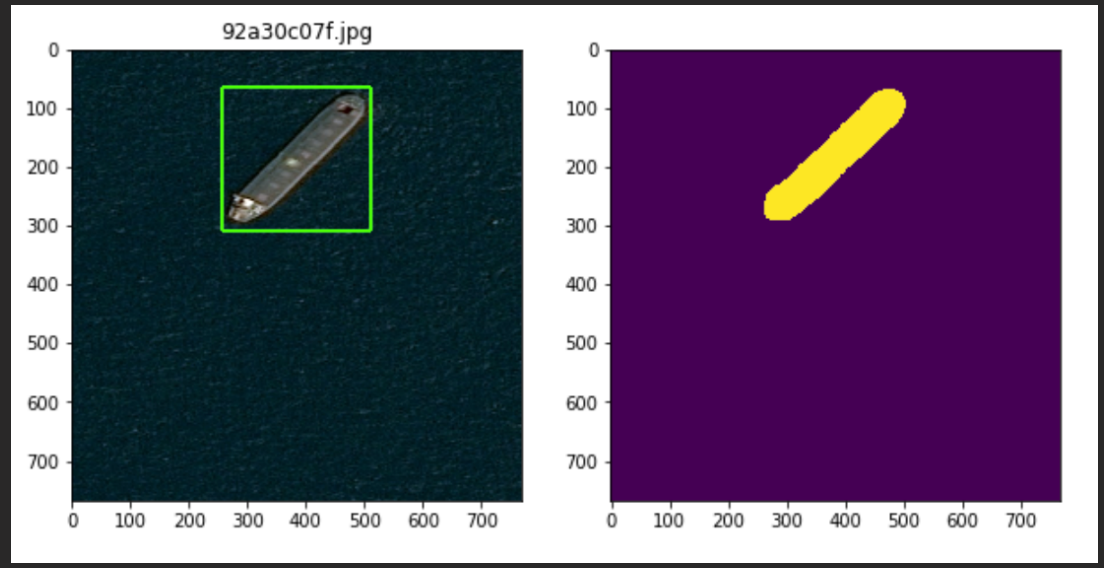


Part II: Ship Instance Segmentation

- Utilised Mask R-CNN, a deep neural network framework proposed by Facebook AI researchers.
- Transfer learning approach using ResNet101 trained on MS COCO dataset
- Used 25,000 + images
- Final model:
  - Test accuracy: 79%

Examples of predictions





Object detection and segmentation mask predictions on test set