

# Proposal for *Airbus* Ship Detection

## Group 4

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### Introduction:

*Airbus*, an aerospace defense company based in Europe, posted a challenge on Kaggle to build a model that classifies ships in satellite imagery. From a defense (and in this case business) perspective, their interest in such a model stems from the fact that traffic in shipping has increased significantly over the past few years, which poses problems for monitoring ships that could be involved in "...piracy, illegal fishing, drug trafficking, and illegal cargo movement." Not only does this challenge help *Airbus* but it also entities that the maritime industry influences, such as insurance companies and environmental agencies.

Data: <https://www.kaggle.com/c/airbus-ship-detection>

### Problem Statement:

Since *Airbus* is a defense company, we need to classify ships in satellite, color images precisely and, more importantly, quickly.

### Objective:

The objective is to become more experienced with complex neural networks and image analysis. That said, we would like to learn how to deal with classifying objects in color images—preprocessing images and methods to make classification of objects in images more precise and stable.

### Methodology:

We will use *PyTorch* or *TensorFlow* to build a convolutional neural network to classify these ships, a function that will convert a complex color image classification problem to edge detection. Once this computational graph is written, we will then find which images are important with respect to the training set. This involves paying close attention to their gradients—the larger the gradient, the more important the image. Regarding efficiency, this might require an optimizer that is faster than a stochastic one.