

# For offered grade

## Deep Learning in practice with Python and Lua

### Assignment - Documentation

#### Project Discription – Airbus Shipping

Airbus is excited to challenge Kagglers to build a model that detects all ships in satellite images as quickly as possible. Can you find them even in imagery with clouds or haze? Here's the backstory: Shipping traffic is growing fast. More ships increase the chances of infractions at sea like environmentally devastating ship accidents, piracy, illegal fishing, drug trafficking, and illegal cargo movement. This has compelled many organizations, from environmental protection agencies to insurance companies and national government authorities, to have a closer watch over the open seas. Airbus offers comprehensive maritime monitoring services by building a meaningful solution for wide coverage, fine details, intensive monitoring, premium reactivity and interpretation response. Combining its proprietary-data with highly-trained analysts, they help to support the maritime industry to increase knowledge, anticipate threats, trigger alerts, and improve efficiency at sea. A lot of work has been done over the last 10 years to automatically extract objects from satellite images with significative results but no effective operational effects. Now Airbus is turning to Kagglers to increase the accuracy and speed of automatic ship detection. Algorithm Speed Prize: After the Kaggle challenge is complete, competitors may submit their model via a private Kaggle kernel for a speed evaluation based upon the inference time on over 40.000 images chips (typical size of a full satellite image) to win a special algorithm speed prize. If you're interested to explore more Airbus data, you are welcomed to check out the OneAtlas Sandbox. And for more insights on our Maritime Surveillance capabilities, have a look at Airbus Intelligence page.

#### How To Run

Download the notebook named „DL\_NHF\_1.ipynb” to your machine, upload it to your google colab folder in your google drive, open the notebook and run every cell in order.

#### Functions Of Files

DL\_NHF.ipynb: The notebook for data download and preparation.

DL\_NHF\_1.ipynb: The notebook for data download, preparation and model training and evaluation.

#### Data Set

The dataset consists of 208.000 areal photographs (referred to as photos) of ships in various environments, and a .csv file with the masks of the ships.

## Data Processing

The data is downloaded, unzipped, and the masks in the .csv are transformed from Run Length Encoded (RLE), into a binary mask, that is an image. Masks with ships have ones in the pixels, where there is a ship, and zeros elsewhere. This translates to a black image with white areas where ships are present.

Both photos and masks are normalized to the domain between zero and one, for the model to be able to process these images.

Generators are used to feed data to the model.

## Model Choice

Our current model choice is a

## Model Design

## Hyperparameter Optimization

## Evaluation

## Conclusion