Inroducion to LaTex

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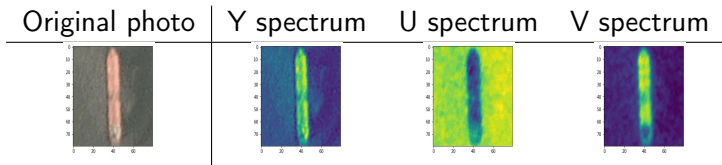# SVM training

1. Picture preproccessing
2. HOG features extraction
3. Training SVM model

Preprocessing
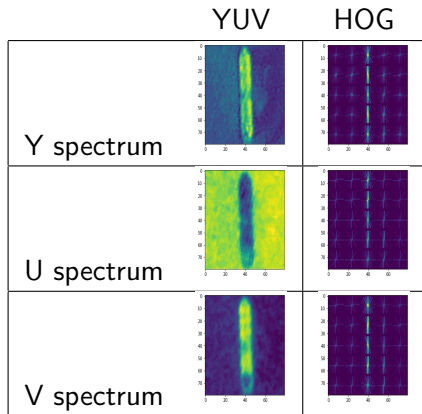
| Original photo | Y spectrum | U spectrum | V spectrum |

The idea here is to increase contrast on picture by switching to other color space

HOG features extraction

YUV   HOG

Y spectrum

U spectrum

V spectrum

HOG algorithms extract features depending on the contrast between pixyls
or blocks of pixels.
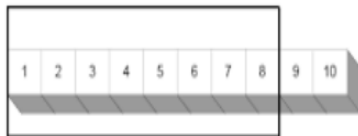
SVM Model training

The SVM model is to be trained using HOG features which are labeled. It is supposed that after a training process the SVM model can distinguish pictures with ship from pictures without.
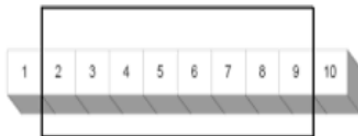
Sliding window technique

Window Sliding Technique is a computational technique which aims to reduce the use of nested loop and replace it with a single loop, thereby reducing the time complexity.

Intial Window

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

(1)

Window Slides ⟶

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

(2)

Heatmap

New image size of the original is created with all pixels' value equal to 0.
Then the areas where a boat is detected are increased in value, whereas
areas where a boat is not detected are decreased in value.