

## Air written digit classification:

Procedure in a nutshell:

- 1) Load the classifier using joblib (pickle file)
- 2) Read the input image
- 3) Convert to grayscale and apply Gaussian filtering
- 4) Threshold the image
- 5) Find contours in the image
- 6) Get rectangles contains each contour
  - 6.1) For each rectangular region, calculate HOG features and predict the digit using **LINEAR SVM**

**6.1.1:** DRAW

**6.1.2:** RESIZE

**6.1.3:** HOG

### PICKLE FILE:

object in python can be pickled so that it can be saved on disk. Pickling is a way to convert a python object (list, dict, etc.) into a character stream. The idea is that this character stream contains all the information necessary to reconstruct the object in another python script.

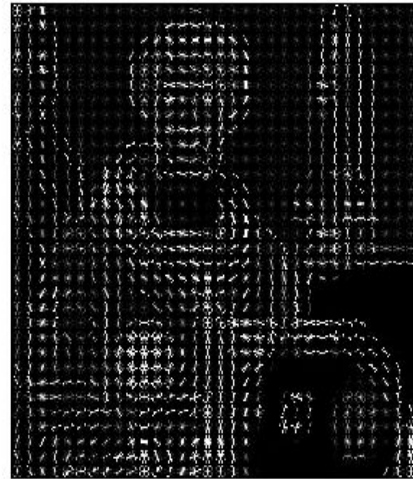
### USING HISTOGRAM OF ORIENTED GRADIENT:

1. (optional) global image normalisation
2. computing the gradient image in x and y
3. computing gradient histograms
4. normalising across blocks
5. flattening into a feature vector

Input image



Histogram of Oriented Gradients



6.

## LINEAR SVM:

Support vector machine constructs a hyperplane or set of hyperplanes in a [high-](#) or infinite-dimensional space, which can be used for [classification](#), [regression](#), or other tasks like outliers detection. Intuitively, a good separation is achieved by the hyperplane that has the largest distance to the nearest training-data point of any class (so-called functional margin), since in general the larger the margin the lower the [generalization error](#) of the classifier. Experimental results show that SVMs achieve significantly higher search accuracy than traditional query refinement schemes after just three to four rounds of relevance feedback. This is also true of [image segmentation](#) systems, including those using a modified version SVM that uses the privileged approach as suggested by Vapnik.

## HOW MY PROJECT WORKS

I have attached a video of how exactly my project works. Hope it helps.