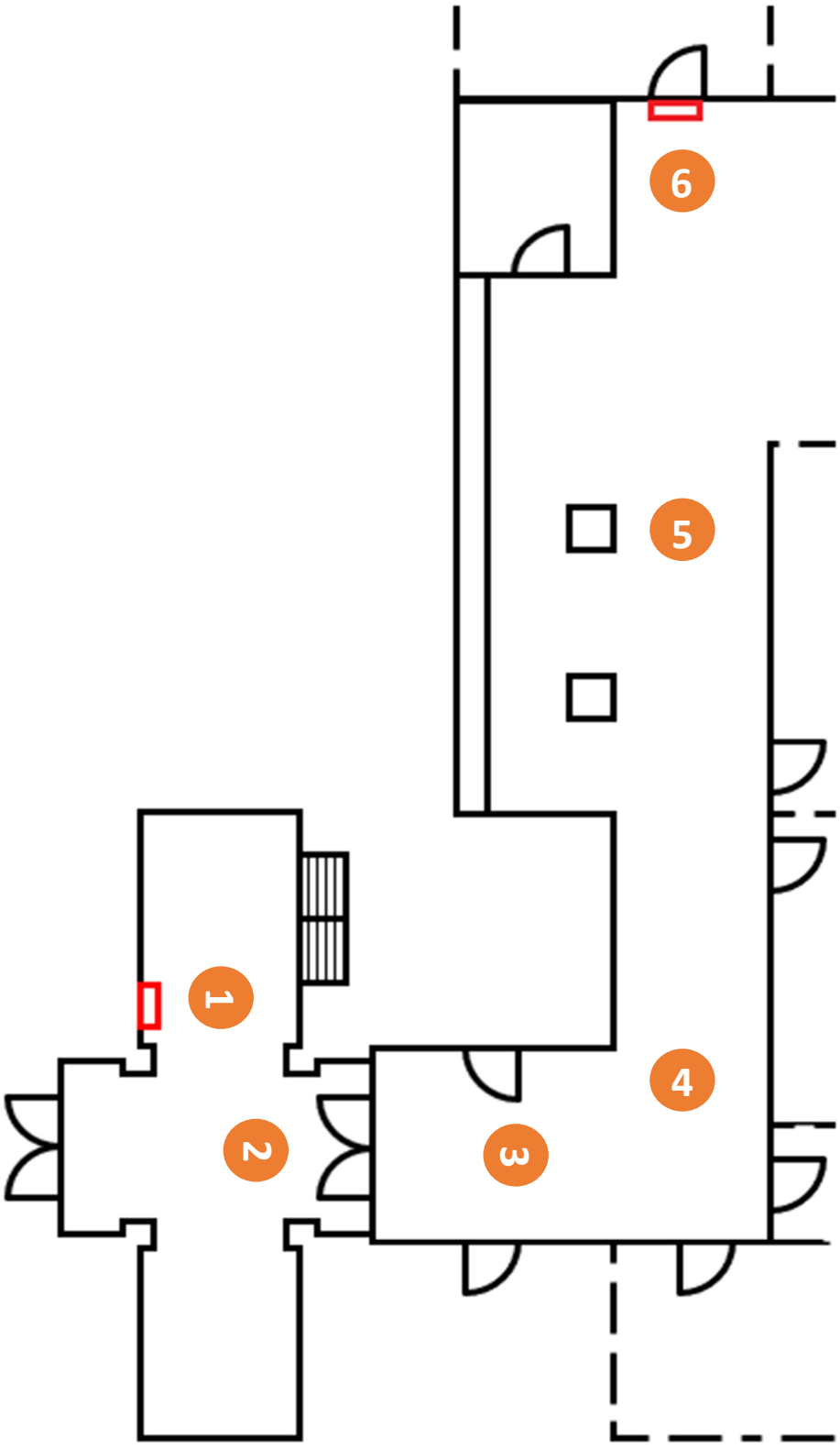
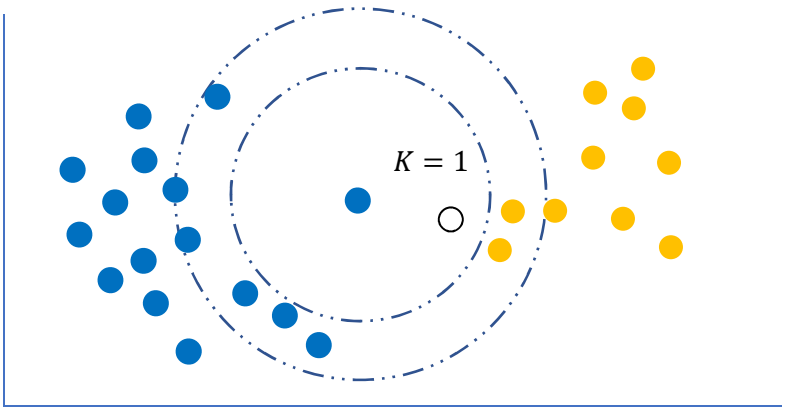
After analyzing the histograms of several images, 6 nodes were chosen as beacons in the map:



'K-NN'

A K-NN algorithm was used in order to find the nearest neighbor and make a prediction on the image node.



STATIC TEST

In total, 7200 images were used, 1200 per each of the 6 nodes identified in the topological map.
Images were split as follows:

- 80% for training
- 20% for testing purposes

The parameters chosen in this algorithm:

- K=9
- Max distance = 6

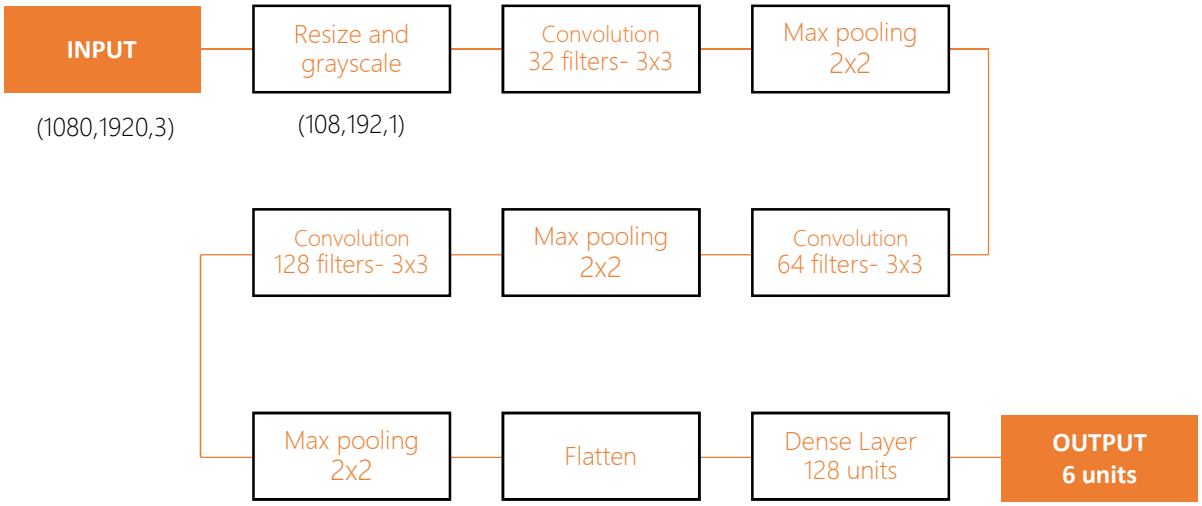
Results provide a 76.4% accuracy in the static test.

DYNAMIC TEST

For the dynamic test (video) a K-NN with parameter K= 13 was implemented. After getting the results, it was decided that better predictions could be made with a neural network architecture.

CONVOLUTIONAL NEURAL NETWORK´

A convolutional type neural network architecture was designed as follows:



STATIC TEST

In total, 7200 images were used, 1200 per each of the 6 nodes identified in the topological map.
Images were split as follows:

- 64% for training
- 16% for cross validation
- 20% for testing purposes

Parameters with which the CNN was trained:

- Epochs = 10
- Batch size = 40
- Optimizer type: Adams
- Metric: Accuracy
- Cost function: Cross entropy

A huge improvement was made in 'Accuracy' = 99.99%.
There is a high chance of this model being prone to overfitting. Further tests are in order.

DYNAMIC TEST

The dynamic test throws impressive results with 98.9% accuracy. Results have indeed proved to be far superior to those of the KNN.