



# **IMPLEMENTING NIGHTWATCH**

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# TRAINING SET



Generated a training set by photographing many images of lock opening and picking.



Helped us form a set of images for data, which we process before model training.





# DATA PREPARATION

## Bounding Boxes

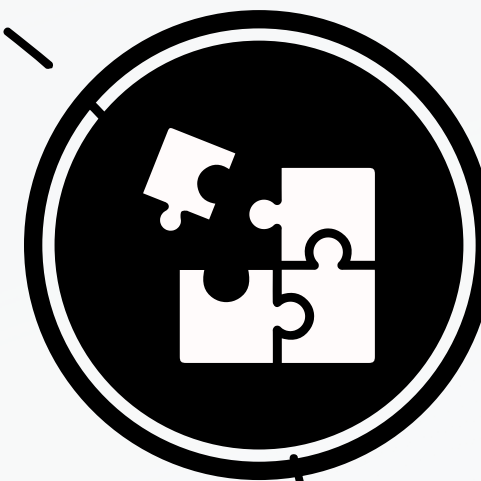
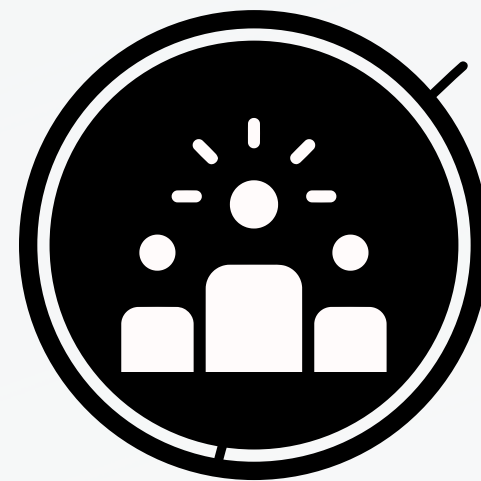
Images were annotated with boxes around individuals unlocking a lock to enable the model to identify all those attempting to open it.

## Labels

Bounding boxes were created using makesense.ai, and the rectangle coordinates were subsequently added manually.

## Training Set

Matching labels and images were assigned identical filenames to establish a link for training the model to replicate the custom bounding boxes.



# MODEL TRAINING



The model was trained using YOLOv5. Since we need to find only if the person is opening or picking the lock, we use binary cross-entropy to find losses/errors in prediction and improve the prediction according to those losses, improving the prediction with each epoch.



# REALTIME CAPTURE

After model training, we capture the live feed of a security camera (for the sake of feasibility, we will just download a video file for now, but can be easily integrated with RaspberryPi) and check every frame for the detection of a person opening a lock. If the person stays by the lock for more than 20 seconds (our threshold is 20 seconds, which can be changed) worth of frames, the person will be considered picking the lock and not the owner of the cycle.

**THANKS FOR  
WATCHING!**

