Classification Of Singapore Traffic Road Sign

AI Applications

AI Applications Student | CV Graded Assignment

Honor Pledge for Graded Assignments

“I affirm that I have not given or received any unauthorized help on this assignment, and that this work is my own.”

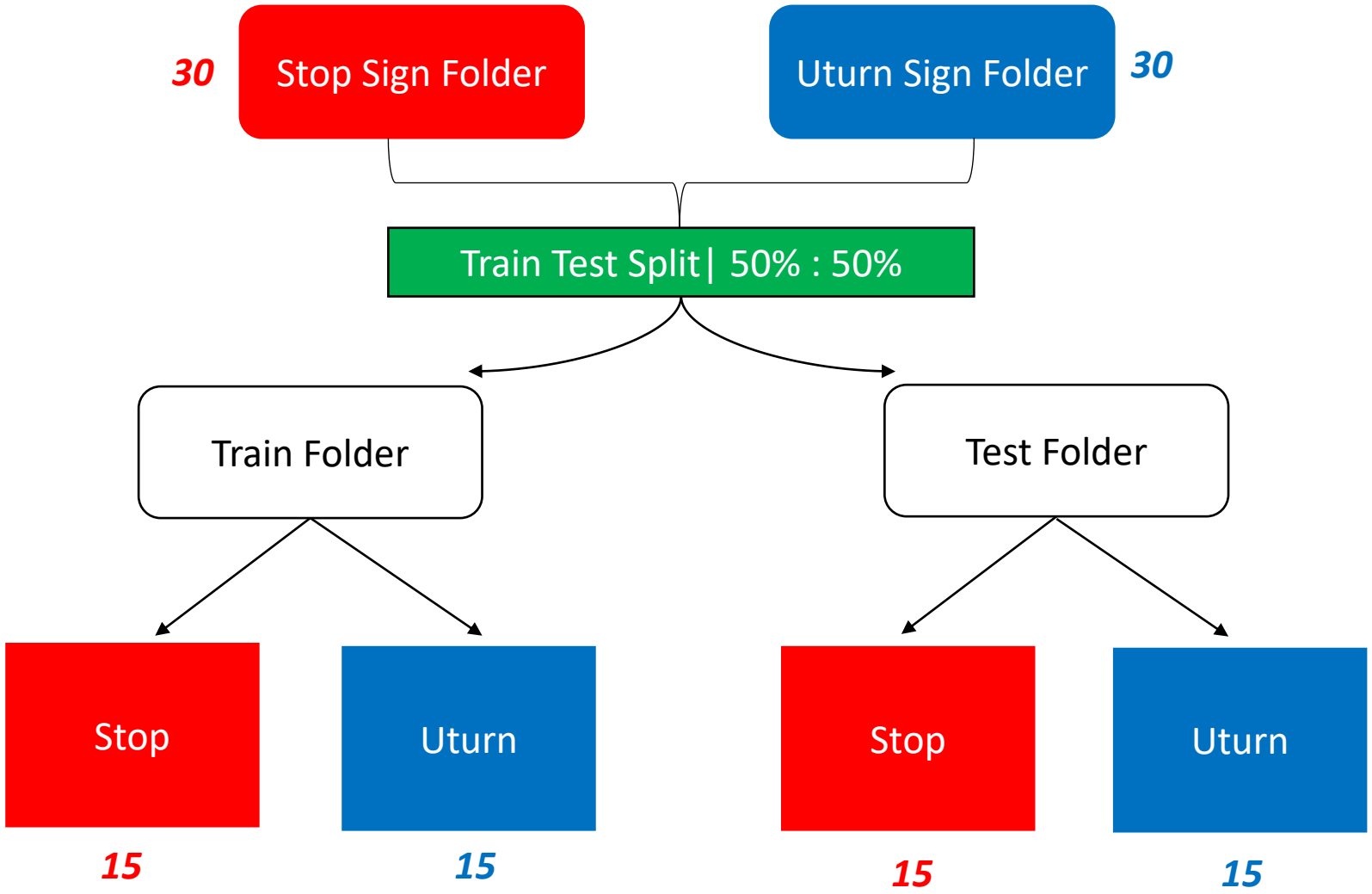
Signature:

Summary

- Data Pre-Processing
- Model Creation
- Prediction Results
- Difficulties Encountered & Learning Points

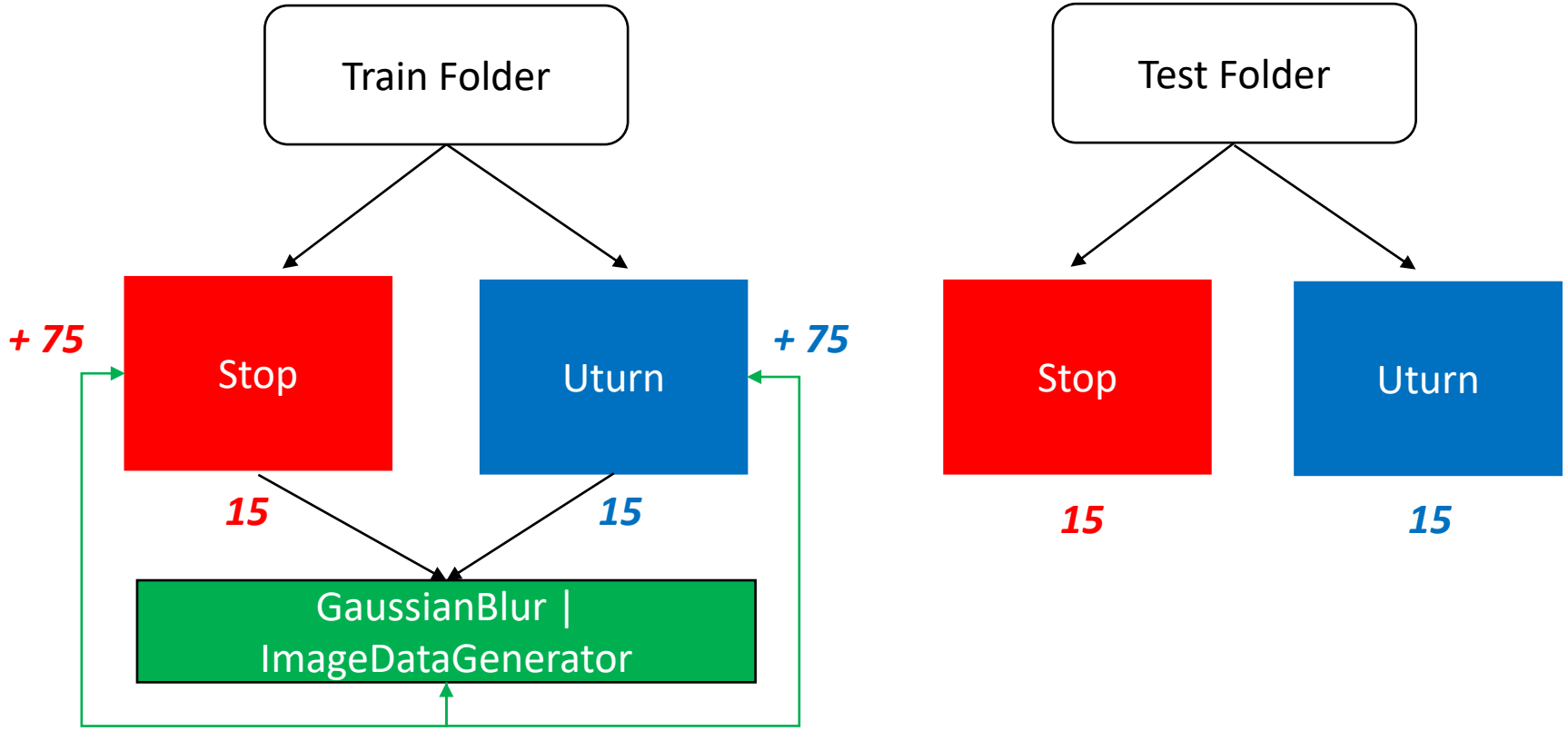
Data Pre-Processing

- Train Test Split



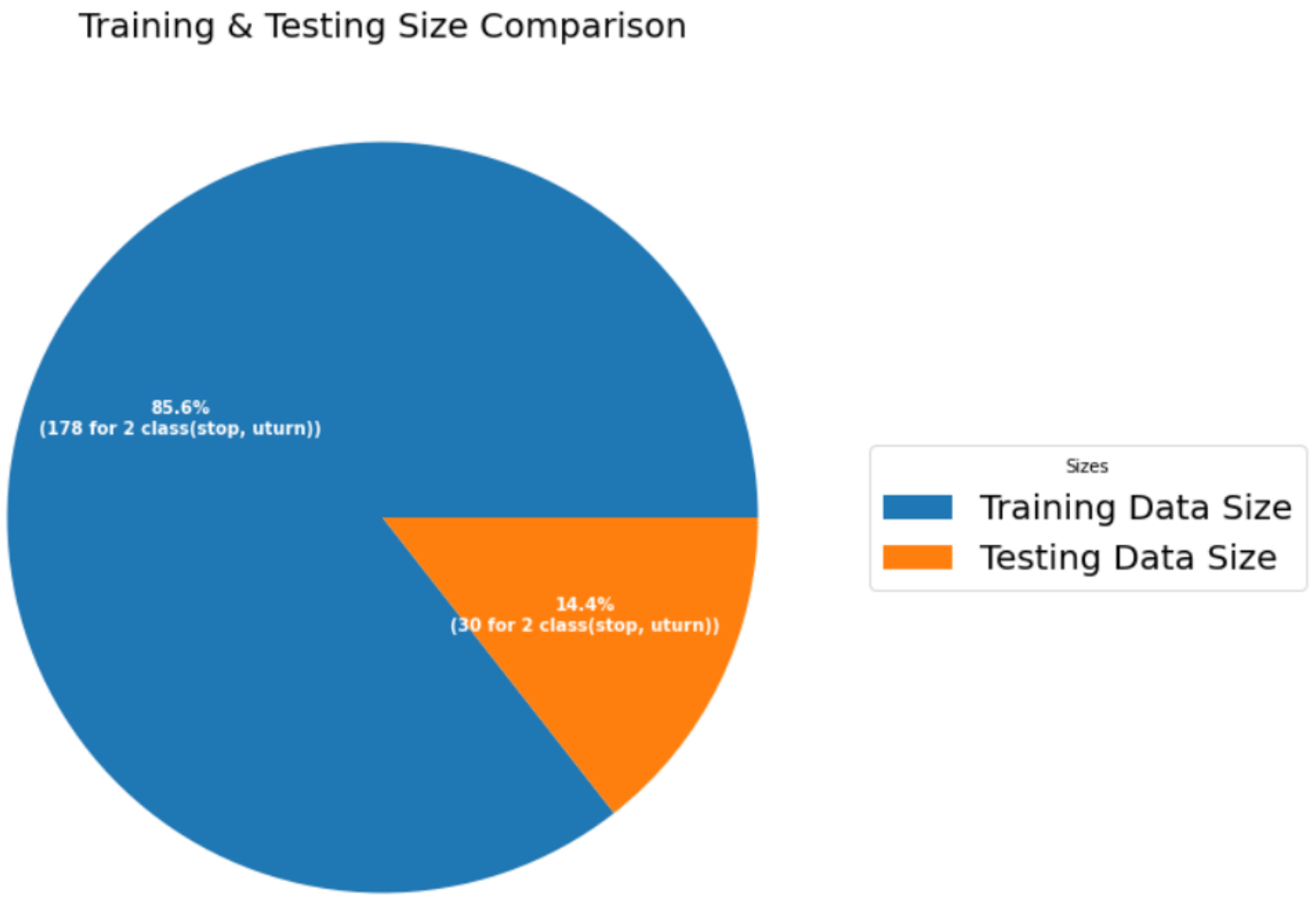
Data Pre-Processing

- Data Augmentation
- Add 75 more augmented images
- Both classes in Train Folder



Data Pre-Processing

- Pie Chart



Model Creation

- Convolutional Neural Network
- 2 Conv Layers
- 2 MaxPooling Layers
- 1 Flatten Layer
- Ouput Dense Layer

```
Model: "sequential_8"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d_14 (Conv2D)          (None, 150, 150, 64)      1792

 max_pooling2d_14 (MaxPoolin  (None, 75, 75, 64)       0
 g2D)

 conv2d_15 (Conv2D)          (None, 75, 75, 64)        36928

 max_pooling2d_15 (MaxPoolin  (None, 37, 37, 64)       0
 g2D)

 flatten_7 (Flatten)         (None, 87616)             0

 dense_7 (Dense)             (None, 1)                 87617

=================================================================
Total params: 126,337
Trainable params: 126,337
Non-trainable params: 0
_________________________________________________________________
```

Model Creation

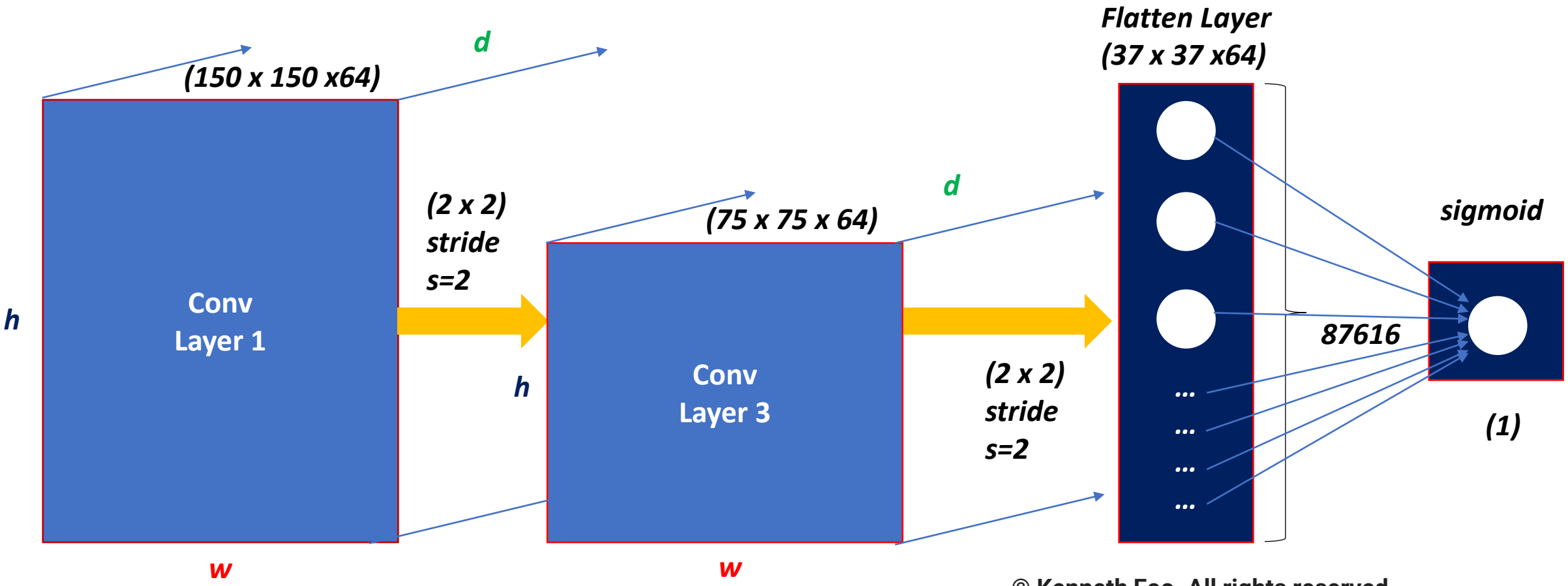
Model Architecture | Kenneth | CV Graded Assignment

Layer Dimensions **Stride**

(h x ***w*** x ***d)*** **(Filter step size)**

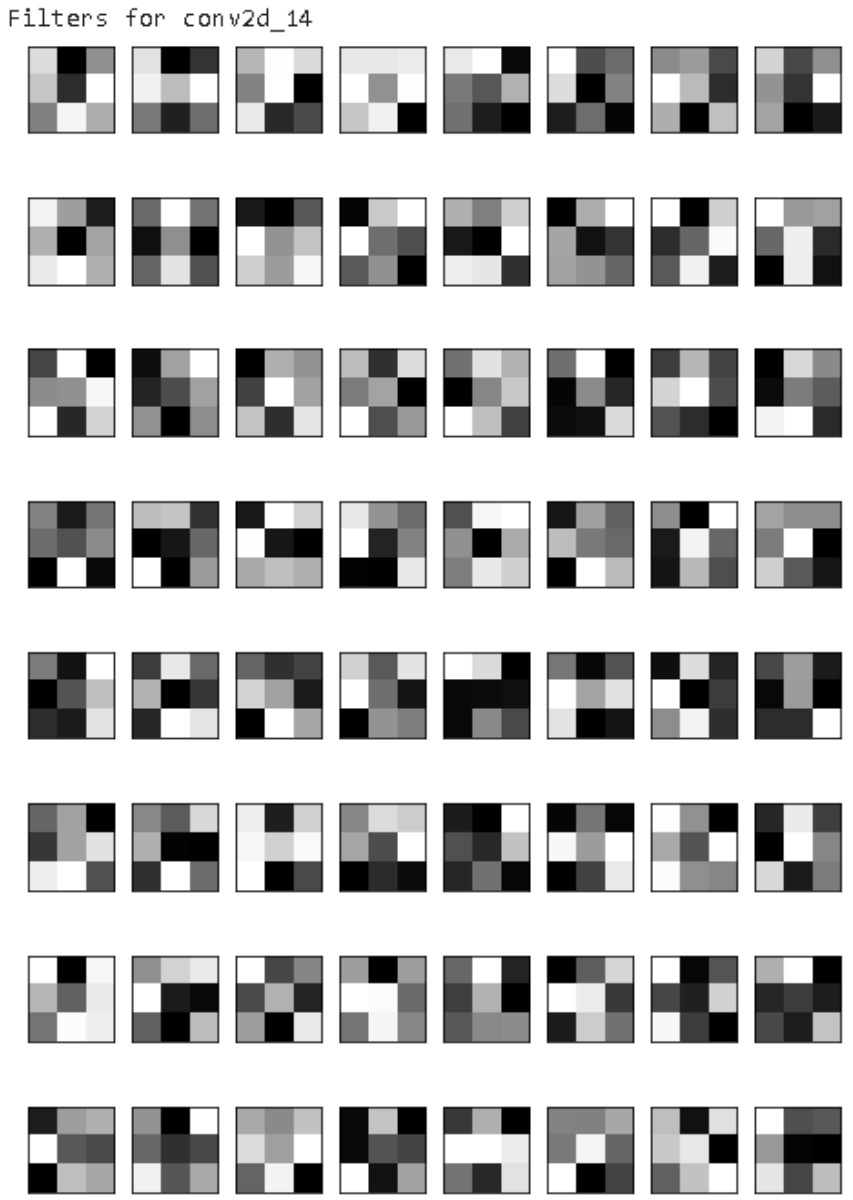
= MaxPooling Layer

h = Height | w = Width | d = (depth) = number of filters



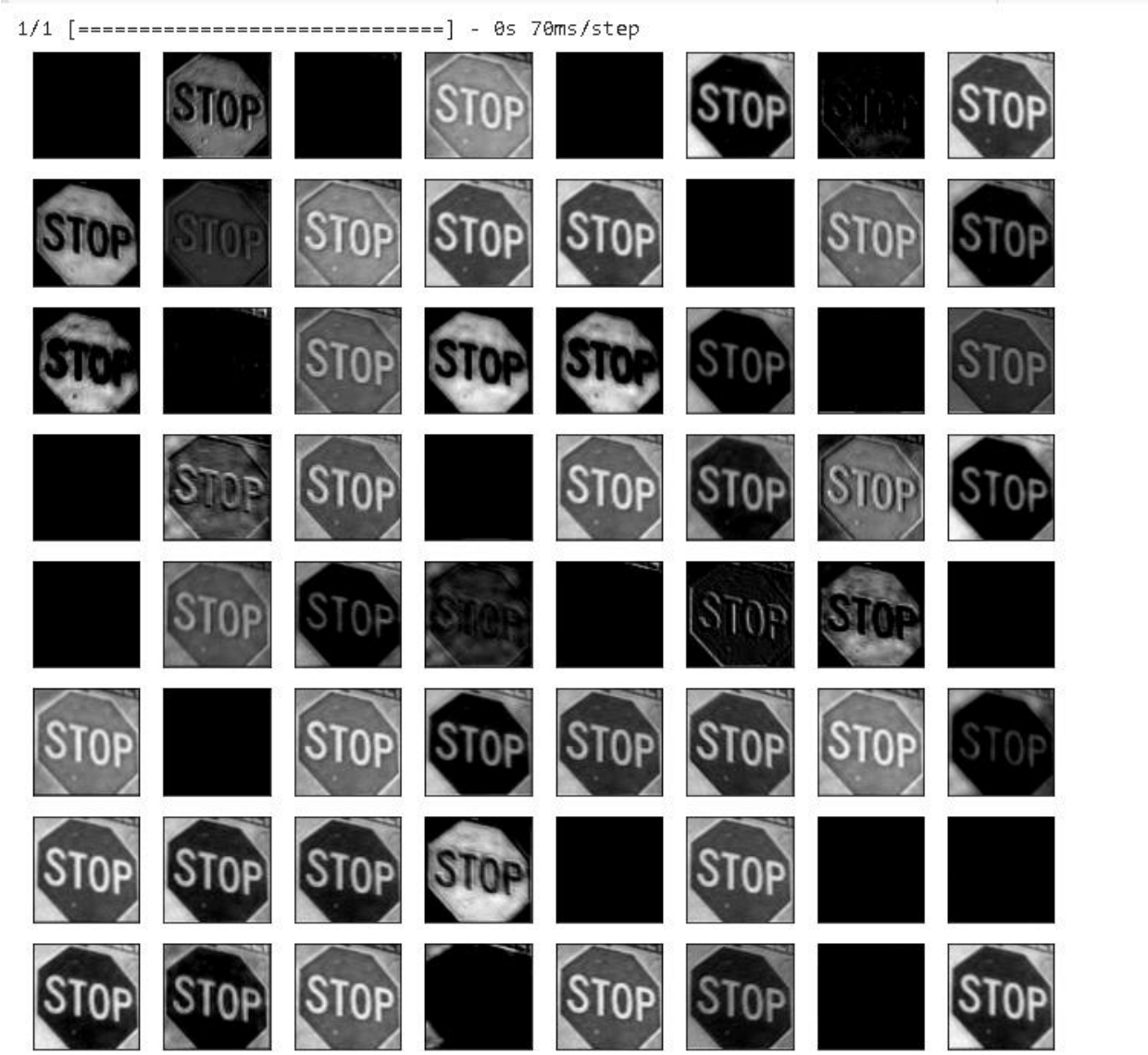
Model Creation

- Understand the filters from the first layer
- 3 by 3 by 64 filter



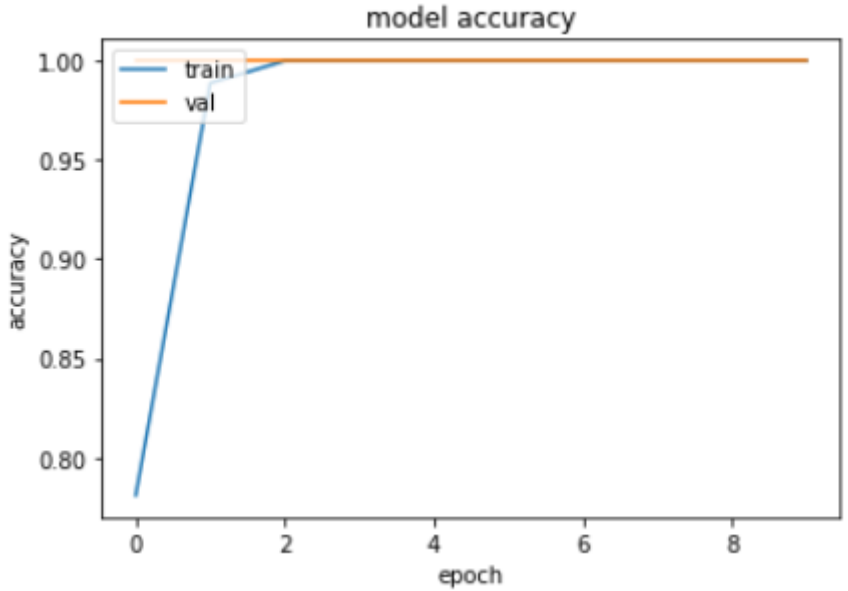
Model Creation

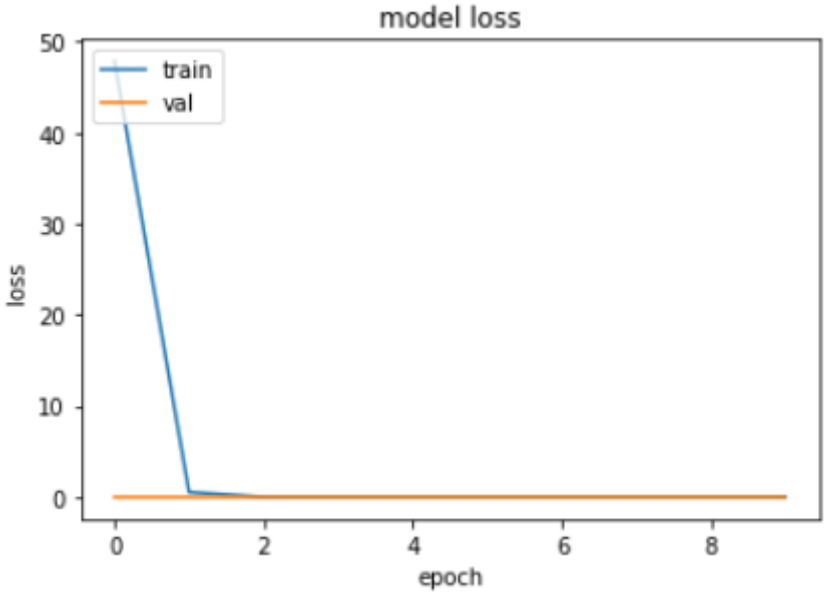
- Define a new truncated model to only include the conv layers of interest
- Generate feature output by predicting on input image
- Representation Learning
- Low & High level features on the right side. ->



Model Creation

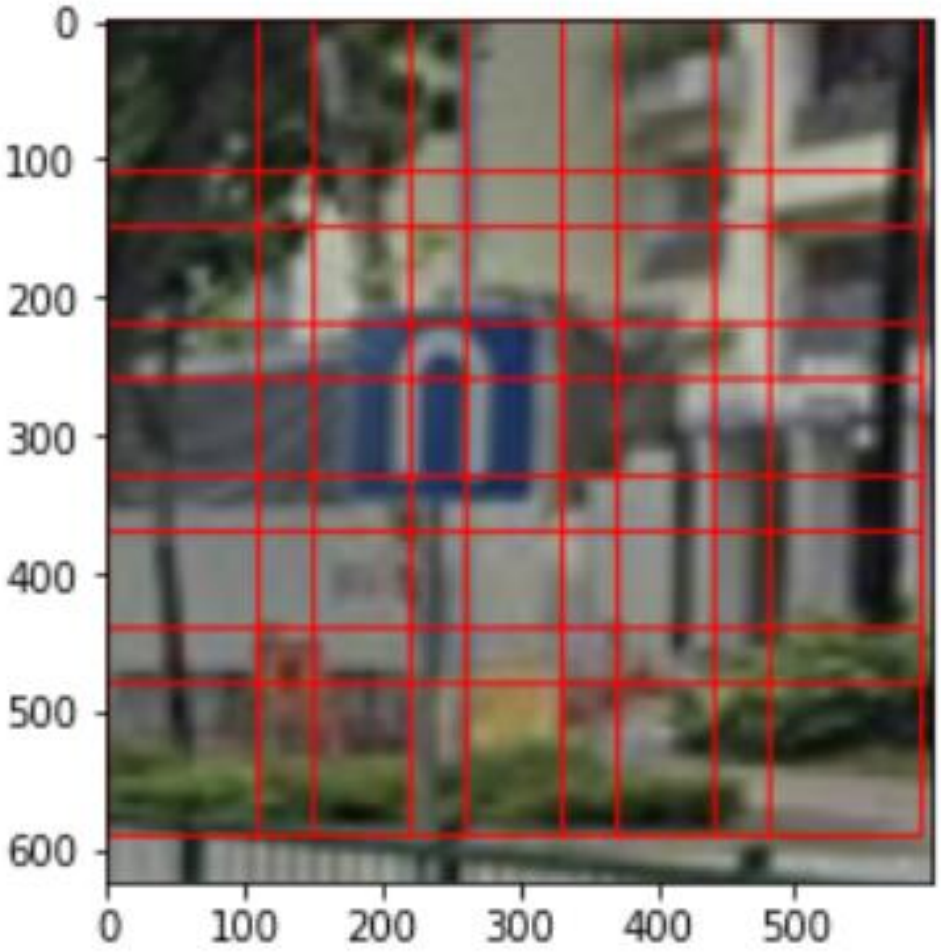
- Model Performance during training and validation





Prediction Results

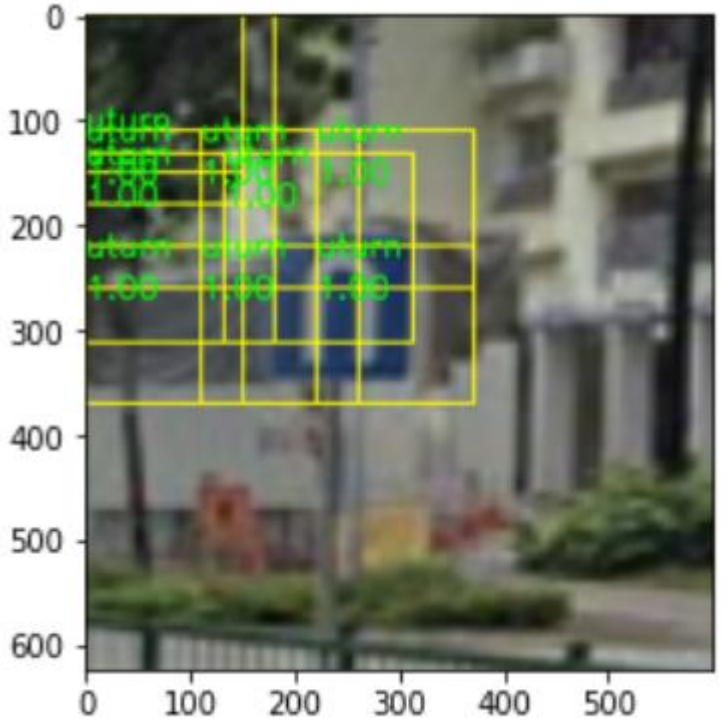
- **Object Detection for Image**
- Constructing a sliding window
- Constructing a image pyramid
- Adjust window for optimal parameters
- Select image for detection



Prediction Results

- **Object Detection for Image**

- Looping over pyramid
- Classifying ROIs
- Do Prediction
- Generate Object Detection Results



highest prob label uturn

Difficulties Encountered & Learning Points

“The first difficulty I encountered was the overfitting of my model. I believe the reason for this was because the training and testing sets were too simple for the model to learn, so it probably became overconfident. The way to counter this issue, is to provide an equal ratio of images to both train & test sets. Also, when doing data augmentation, try to not only generate images, but to look at them at different perspectives or maybe you can even flip the image. Reason for doing that is to give a little confusion and information to the model so it learns better and performs better during predictions. The second difficulty encountered was constructing the parameters for the sliding window during image object detection, as different parameters are needed for the difference in images.”

End of Presentation