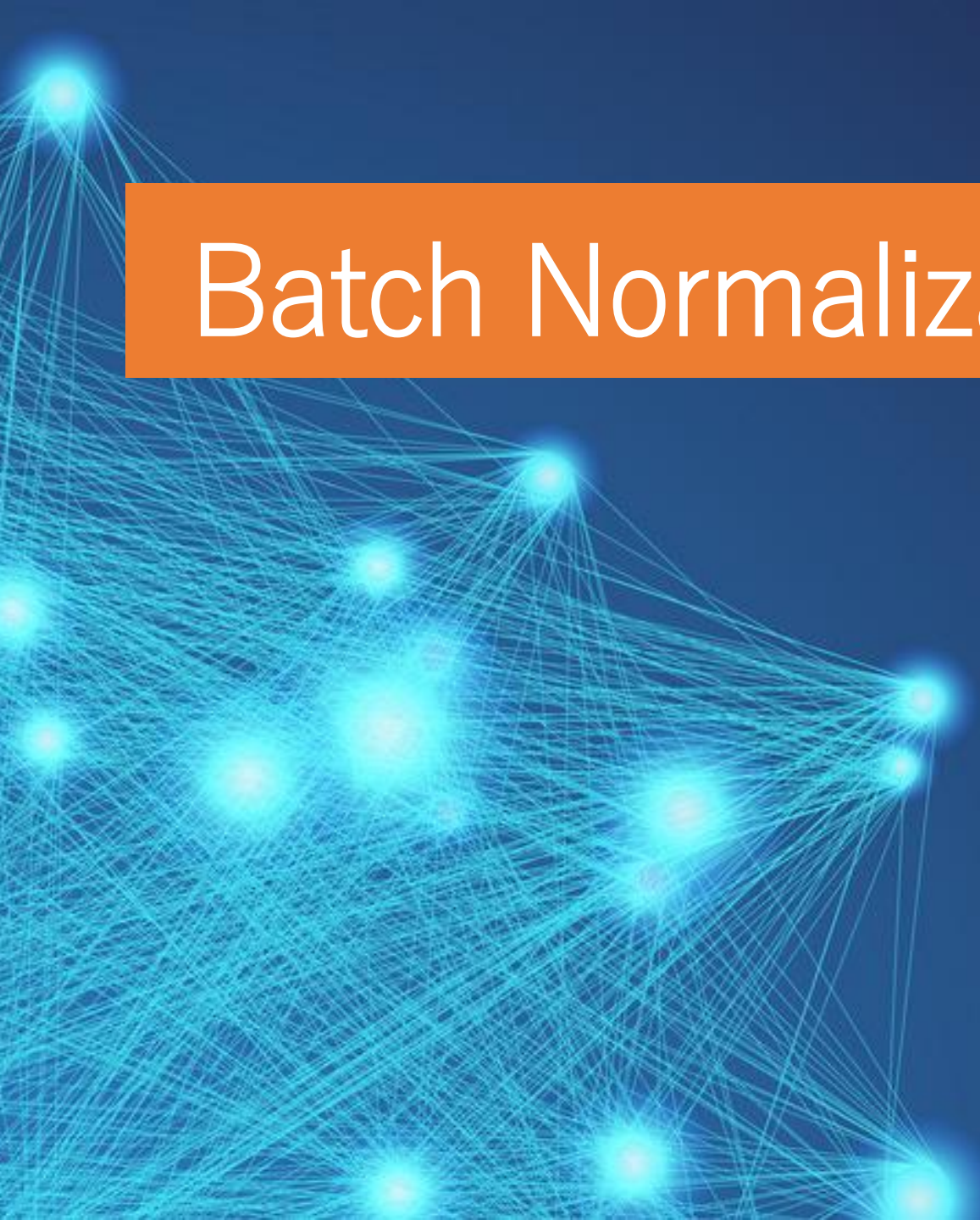
Batch Normalization Cifar-10 Dataset



FADILLA ZENNIFA

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hiring process

Ridge-i

Aim

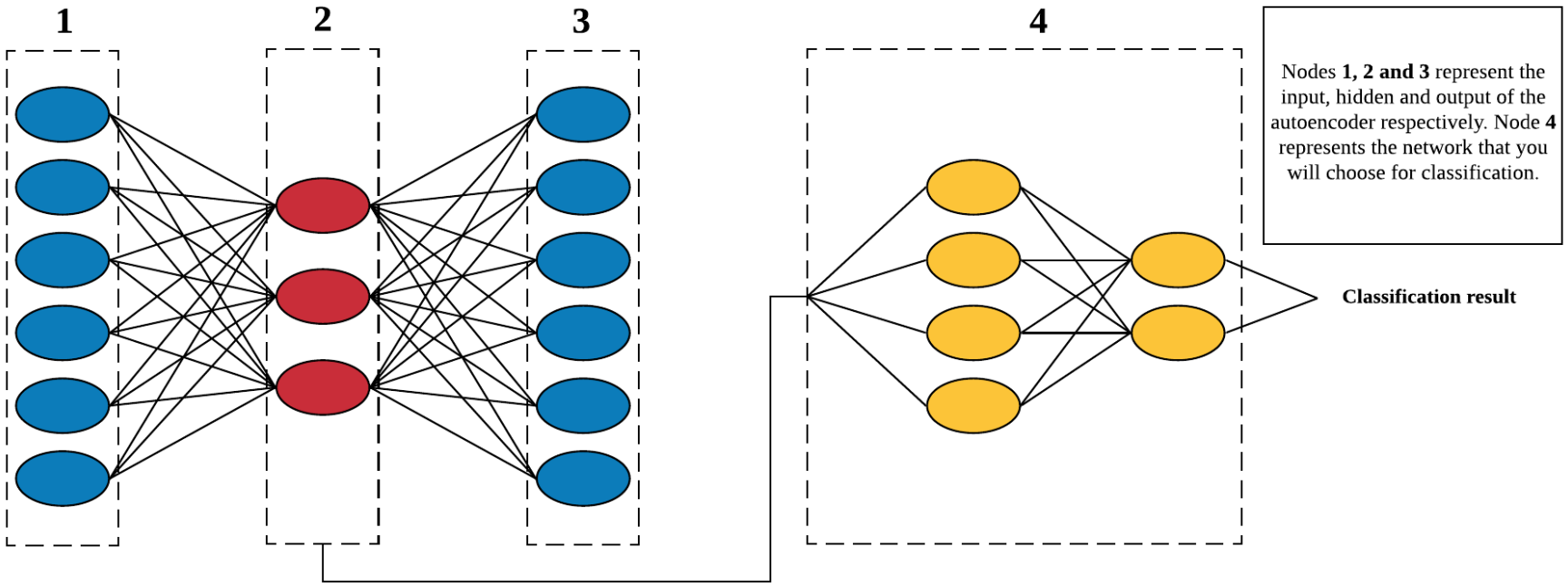
1. Design a network that combines supervised and unsupervised architectures in one model to achieve a classification task.

2. Find the optimum architecture

3. Find appropriate batch

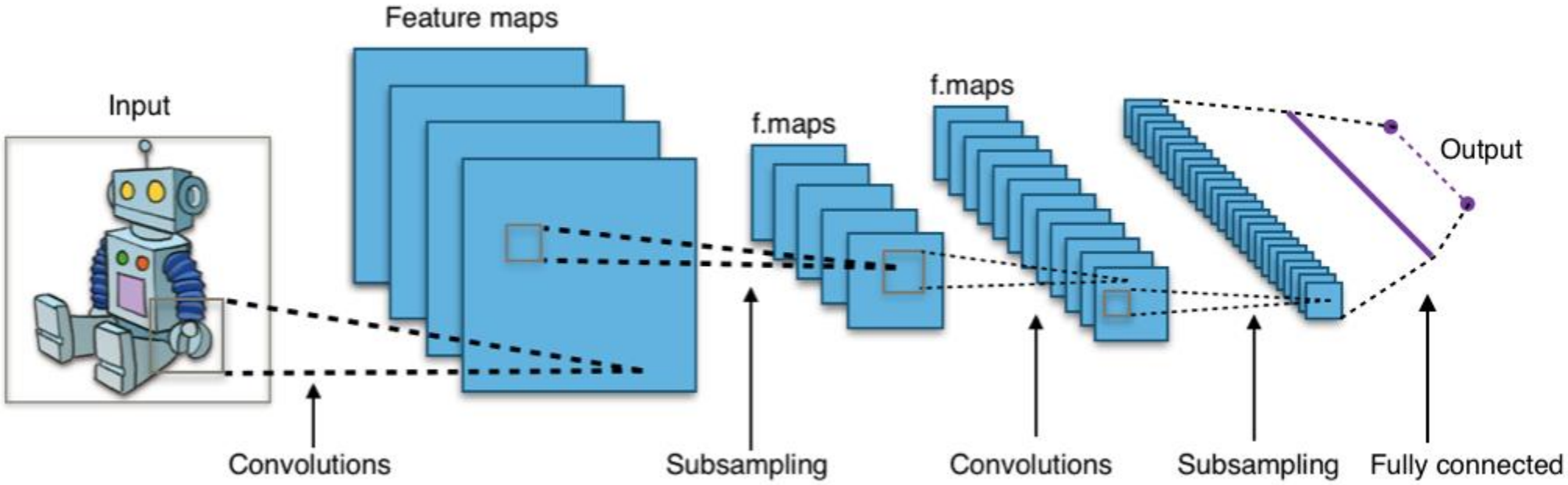
Introduction

? Establish the best design



Ilustration from Ridge-I company hiring process

CNN (Convolutional neural network)



https://commons.wikimedia.org/wiki/File:Typical_cnn.png

Methodology

Cifar10 Dataset

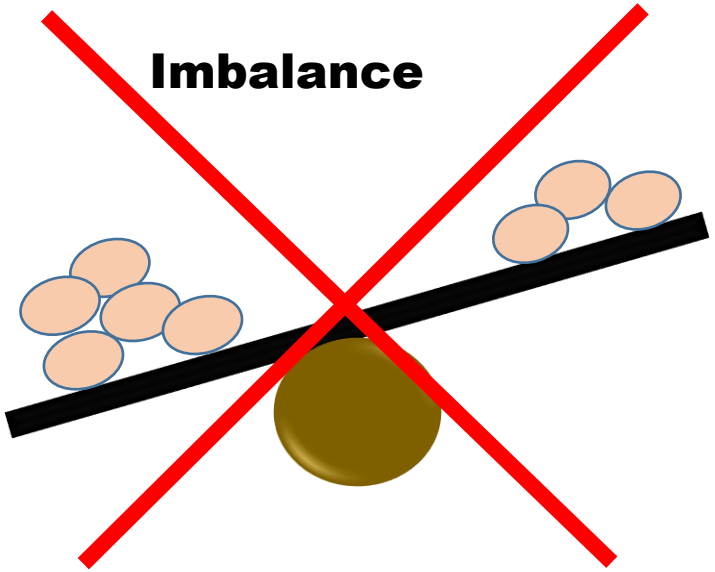
PC Specification

1. Processor Intel® Core™ i5 Operating System Windows 10
2. Graphics NVIDIA® GeForce® 940 MX(Optional)
3. Memory 8 GB DDR4
4. CPU 64 bit

Methodology

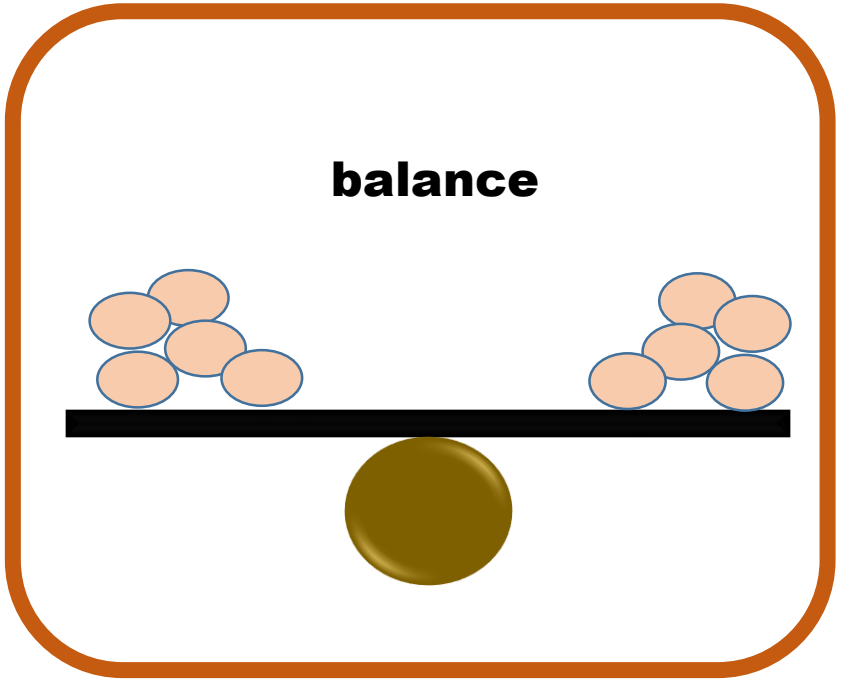
Classes in Cifar 10

0 = airplan,
1= automobile,
2 =bird,
3= cat,
4= deer,
5= dog,
6 = frog,
7= horse,
8= ship,
9 = truck.



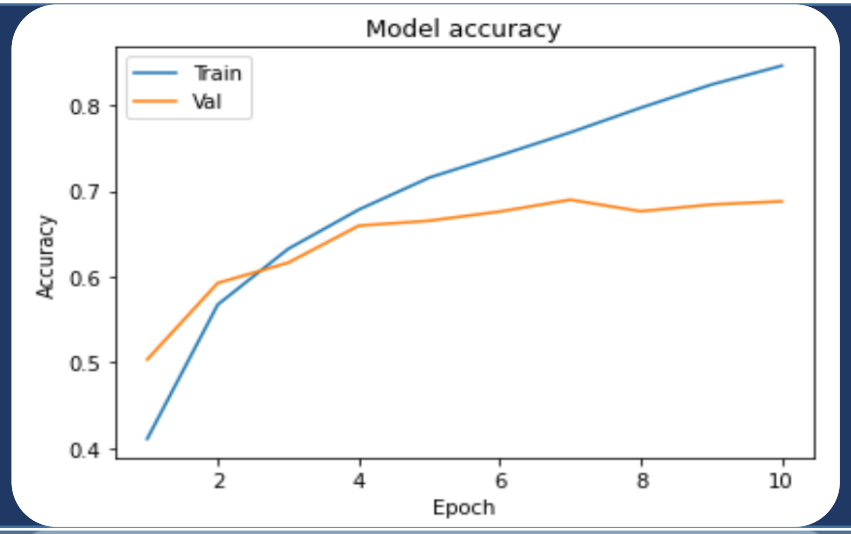
Criteria

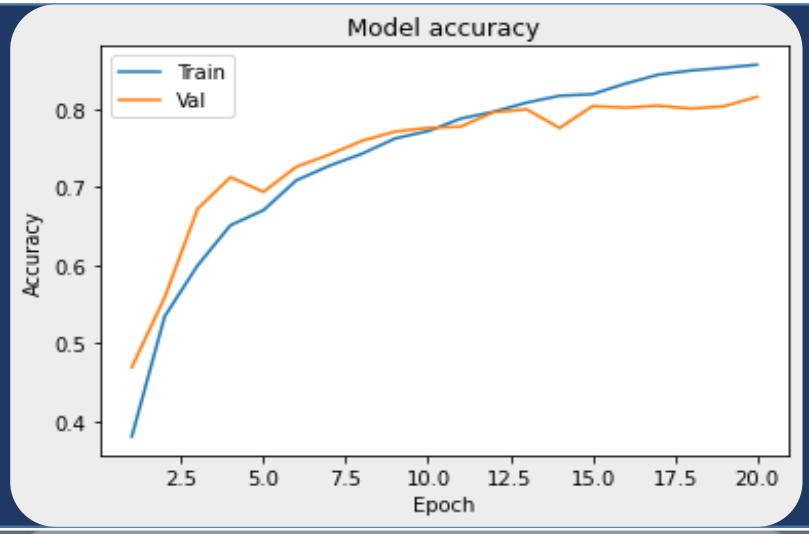
Training set of Cifar 10 consists:
50% of Bird [2]
50% of Deer [4]
50% of Truck [9]



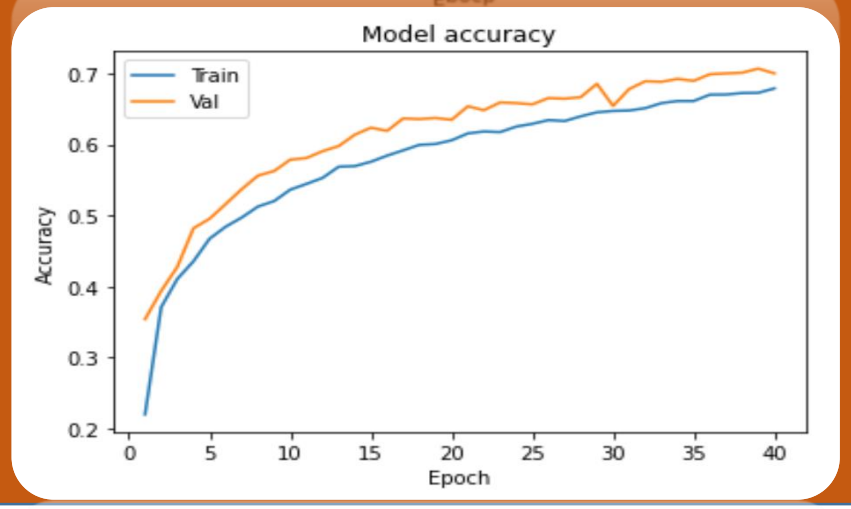
I also chose other class 50%

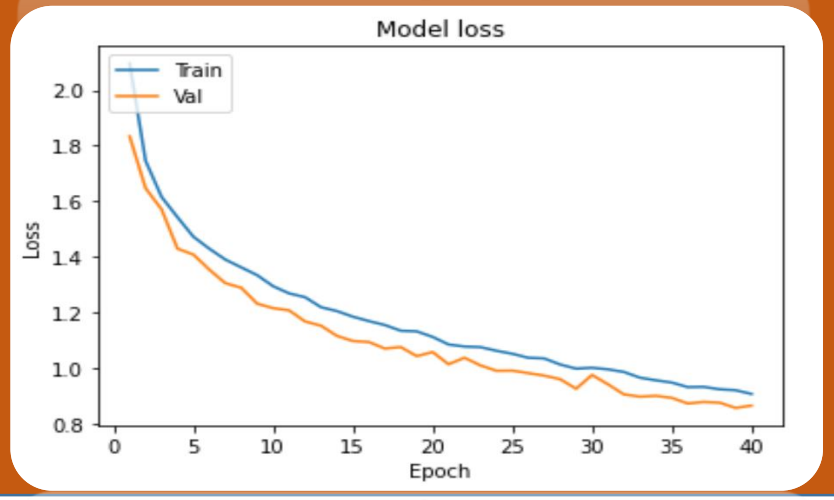
Result





Overfitting



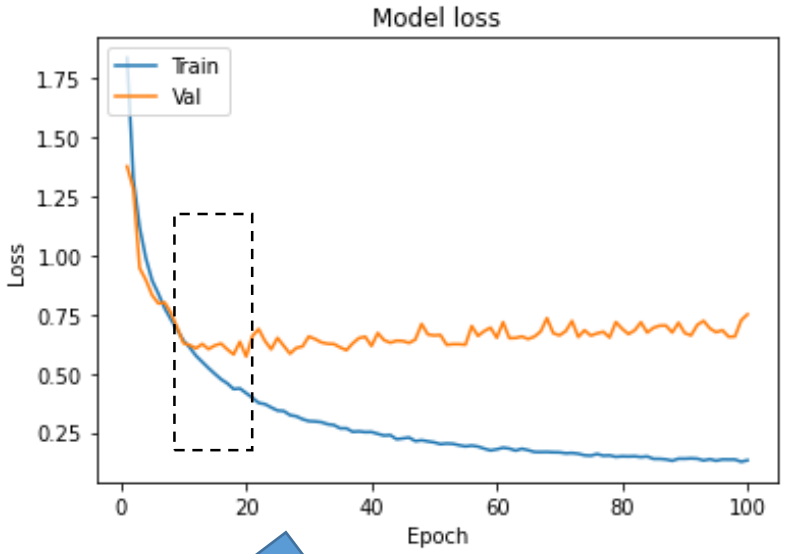


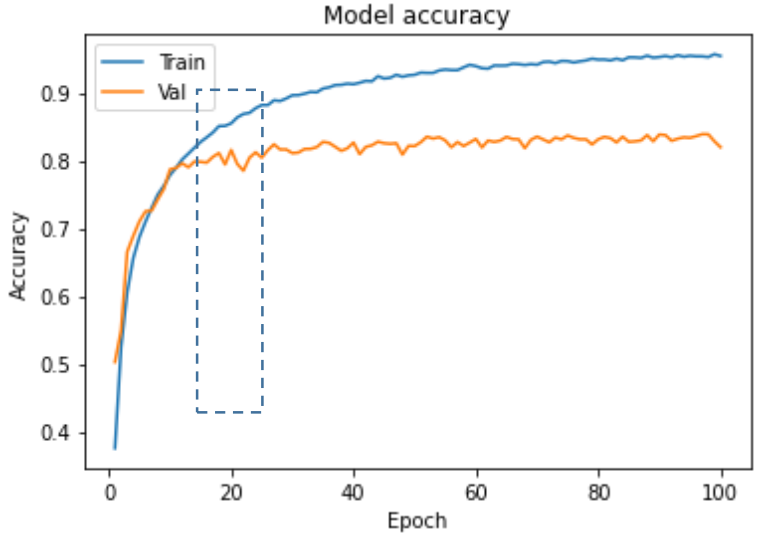
Underfitting

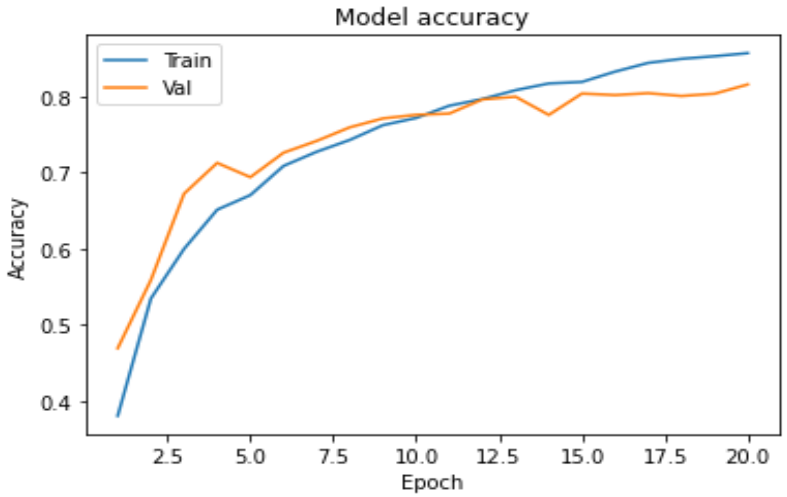
Layers

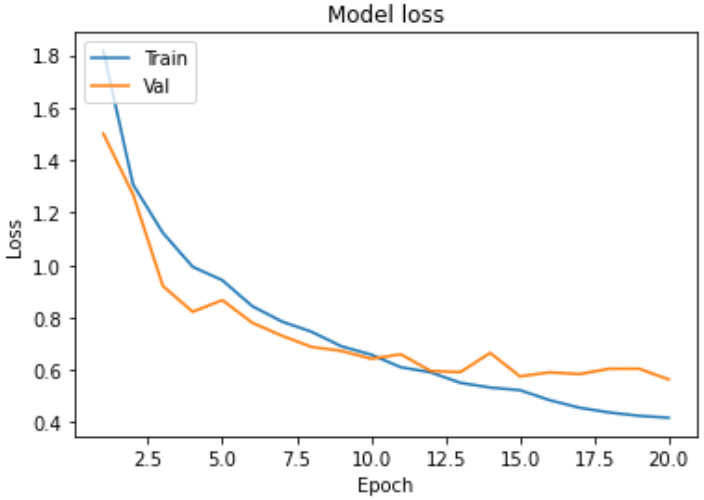
Number of layer	Layer performance	
	Training	Testing
3	96.04%	61.88%
3+ max pooling	91.82%	69.24%
5+ max pooling	77.80%	75.49%
6+ max pooling	95.42%	81.96%

Selected model









Application in New data

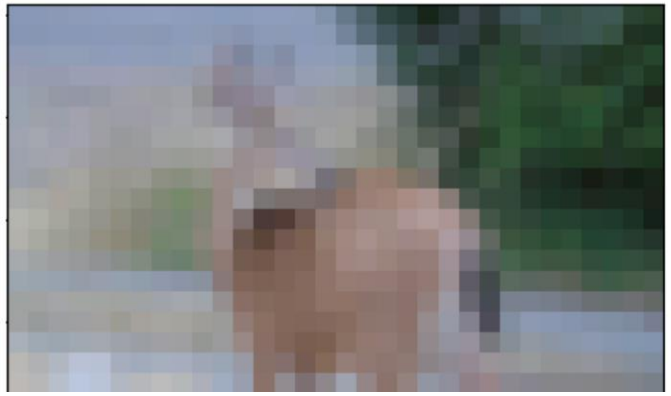
In [26]:
```
img = tf.read_file("Aeroplan.jpg")
img = tf.image.decode_jpeg(img, channels=3)
img.set_shape([None, None, 3])
img = tf.image.resize_images(img, (32, 32))
img = img.eval(session=sess) # convert to numpy array
img = np.expand_dims(img, 0) # make 'batch' of 1
# prepare pixel data
img = img.astype('float32')
img = img / 255.0

#pred = model.predict(img)
result = new_model.predict_classes(img)
print(result[0])
Image("Aeroplan.jpg")
```

0

Out[26]:

In [14]:
```
#evaluate model
from IPython.display import Image
Image("deer.png")
#print('Images Shape: {}'.format(X_train.shape))
```

Out[14]:



In [15]:
```
init = tf.initialize_all_variables()
sess = tf.Session()
sess.run(init)


img = tf.read_file("deer.png")
img = tf.image.decode_jpeg(img, channels=3)
img.set_shape([None, None, 3])
img = tf.image.resize_images(img, (32, 32))
img = img.eval(session=sess) # convert to numpy array
img = np.expand_dims(img, 0) # make 'batch' of 1
# prepare pixel data
img = img.astype('float32')
img = img / 255.0

#pred = model.predict(img)
result = new_model.predict_classes(img)
print(result[0])
#acc

#class_names = ['airplane', 'automobile', 'bird', 'cat', 'deer',
  #            'dog', 'frog', 'horse', 'ship', 'truck']
```

```
WARNING:tensorflow:From /home/agemono/.pyenv/versions/anaconda3-4.4.0/lib/python3.6/site-packages/tensorflow_core/python/util/tf_shoul
d_use.py:198: initialize_all_variables (from tensorflow.python.ops.variables) is deprecated and will be removed after 2017-03-02.
Instructions for updating:
Use `tf.global_variables_initializer` instead.
4
```

Conclusion

Normalize batch > Manual batch

6 layers > less than 6 layers

References

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