Machine Learns To Detect Green and Red Lights Using AlexNet

Dov Cattan

Student, Computer Engineering
Florida Atlantic University

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The importance of Machine Learning as opposed to Machine Memory

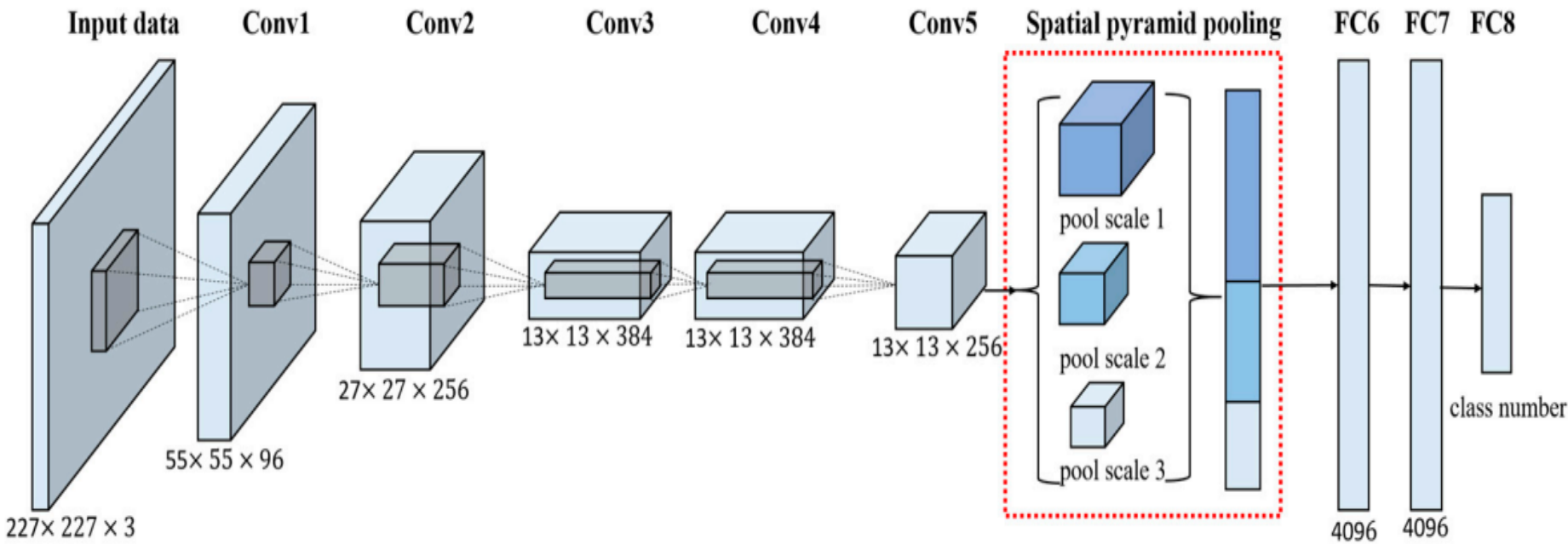
As opposed to memorizing the correct answers on a test, it is more important to learn why the answers are correct. The same applies to AI here, as we use a Convolution Neural Network (CNN) called an AlexNet here to train and test the machine (AI) for accuracy.

```
model = train_model(model, num_epochs=20)
```

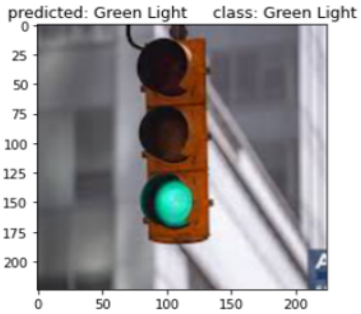
```
Epoch:  1 / 20
/usr/local/lib/python3.7/dist-packages/torch/utils/data/dataloader.py:490: UserWarning: This DataLoader will create 4 worker pr
  cpuset_checked))
Train  Acc: 0.98
Valid  Acc: 0.85
######################
Epoch:  2 / 20
Train  Acc: 0.91
Valid  Acc: 0.85
######################
Epoch:  3 / 20
Train  Acc: 0.91
Valid  Acc: 0.85
######################
Epoch:  4 / 20
Train  Acc: 0.90
Valid  Acc: 0.85
######################
Epoch:  5 / 20
Train  Acc: 0.93
```

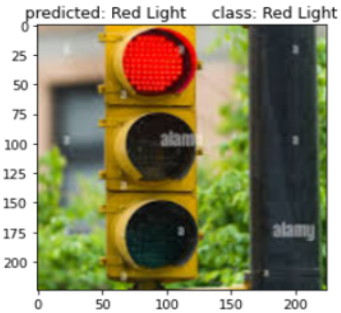
How the Alexnet works

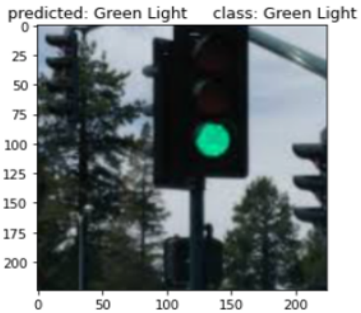
The Alexnet is a convolution neural network (CNN) architecture, that has convolution, pooling, and ReLU layers that can detect certain pixels from an image that the programmer wants the machine to learn.

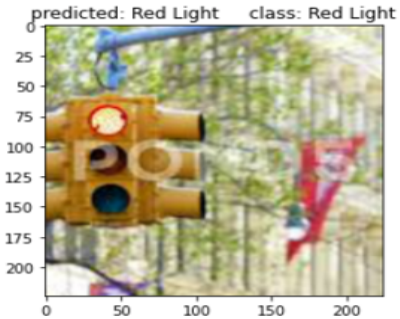


How is the Alexnet applied to differentiating traffic light colors









From images given to the Alexnet from a dataset, the AI learns to differentiate images of red and green lights, as opposed to memorizing.

References

Han, Xiaobing, Yanfei Zhong, Liqin Cao, and Liangpei Zhang. 2017. "Pre-Trained AlexNet Architecture with Pyramid Pooling and Supervision for High Spatial Resolution Remote Sensing Image Scene Classification" Remote Sensing 9, no. 8: 848. https://doi.org/10.3390/rs9080848