

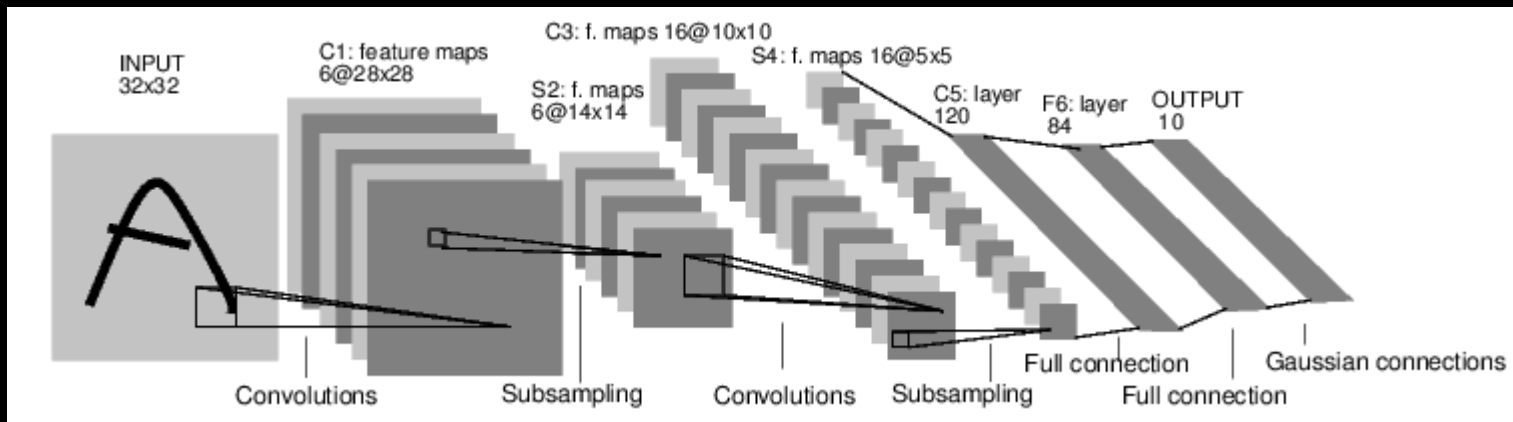
REU Week 7

Jared Rhizor

New Convolutional Neural Network Library

It can generate output $\sim 10x$ faster than the DeconvNetToolbox.

It currently uses the LeNet5 architecture for the MNIST dataset.



Using LeNet5 - Classification Rates

All Training Data - 91.7%

All Test Data - 87.8%

Target for testing data is ~95%

Almost all error is from classifying humans as not human.

All human test images: 51.5%

All human train images: 52.98% - much too low

Correct Results

True Positives (fairly reasonable)



True Negatives (unreasonable)



Most Confidence

Least Confidence



Results

False Negatives (unreasonable)



False Positives (very unreasonable)



Most Confidence

Least Confidence



More humans detected as not human



So we looked at the filters generated.

Filters



Improving Filters

Although some seem to encode some information, they do not in general.



We will be adding layers and changing subsampling sizes to prevent the large jump.

Reasonable Results

Modifying the structure of the network should allow us to have reasonable detection results.

Improving Results

Integral channel features

- provide initial structure (novel)
- some useful features may be easier to learn
- successfully used for another form of human detection