

Deep Learning Overview (& Examples)

September 8, 2019



Huntsville AI

https://hsv-ai.com/meetups/190227_amazon_rekognition/



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Deep Learning Techniques

The two techniques that we'll cover today are the Convolutional Neural Network (CNN) and the Recurrent Neural Network (RNN).



Convolutional Neural Net

A great way to get started in Deep Learning is through the free Fast.ai courses. We'll walk through an example of their first course that covers image recognition with a CNN.

Use this to set up colab to use fast.ai:

```
!curl -s https://course.fast.ai/setup/colab | bash
```

Fast.ai Lesson 1

<https://colab.research.google.com/github/fastai/course-v3/blob/master/nbs/dl1/lesson1-pets.ipynb>

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Convolutional Neural Net

While the Fast.ai libraries are very useful at getting something to work rather quickly, there are times when you want to go deeper and do things by hand.

Tensorflow Lesson

https://colab.research.google.com/github/tensorflow/examples/blob/master/courses/udacity_intro_to_tensorflow_for_deep_learning/l03c01_classifying_images_of_clothing.ipynb

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Deep Neural Net Benchmarks

If you noticed, the fast.ai course downloaded a pre-trained model for the ResNet. Here is a benchmark that measured current training time and cost for various Deep Learning challenges:

<https://dawn.cs.stanford.edu/benchmark/>



Recurrent Neural Networks

From Wikipedia:

A recurrent neural network (RNN) is a class of artificial neural network where connections between nodes form a directed graph along a temporal sequence. This allows it to exhibit temporal dynamic behavior. Unlike feedforward neural networks, RNNs can use their internal state (memory) to process sequences of inputs. This makes them applicable to tasks such as unsegmented, connected handwriting recognition or speech recognition.

Let's walk through a discussion we had earlier this year with Huntsville AI:

https://colab.research.google.com/github/HSV-AI/presentations/blob/master/2019/190612_Recurrent_Neural_Networks.ipynb

https://colab.research.google.com/github/HSV-AI/presentations/blob/master/2019/190626_RNN_TimeSeries_Part3.ipynb