

Introduction to Machine Learning with Neural Networks.

With James Oswald

Format

- Grant Sanderson's Deep Learning Series
 - But what is a Neural Network? | Deep learning, chapter 1
 - Gradient descent, how neural networks learn | Deep learning, chapter 2
 - What is backpropagation really doing? | Deep learning, chapter 3
 - Backpropagation calculus | Deep learning, chapter 4
- Let's Look at the (Hard) Code
- Frameworks! Machine Learning Made Easy! (Tensorflow)
 - 3Blue1Brown Example
 - Convolutional Neural Networks
 - Classifying our own digits
- My Research, classifying types of data using CNN

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Neural Networks



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1



But what is a Neural Network? | Deep learning, chapter 1

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Gradient descent, how neural networks learn | Deep learning, chapter 2

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What is backpropagation really doing? | Deep learning, chapter 3

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Backpropagation calculus | Deep learning, chapter 4

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Sample Code (The hard way)

 mnielsen / [neural-networks-and-deep-learning](#)

[Code](#) [Pull requests](#) **2** [Actions](#) [Security](#) [Insights](#)

 master ▾

 3 branches

 0 tags

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[Add file ▾](#)

[Code ▾](#)



mnielsen Merge pull request #78 from marcosscriven/master ...

d15df08 on Mar 12, 2018

 235 commits



data

Adding gzip mnist data

7 years ago



fig

Wrong paramter for function make_plots

3 years ago



src

...

3 years ago



.gitignore

...

6 years ago



README.md

Update README.md

3 years ago



requirements.txt

Pin requirements.txt to working set, including older theano.

3 years ago

README.md

Let's look at some BETTER code! With Tensorflow

```
num_classes = 10
input_shape = [28, 28, 1]

# the data, split between train and test sets
(train_images, train_labels), (test_images, test_labels) = keras.datasets.mnist.load_data()

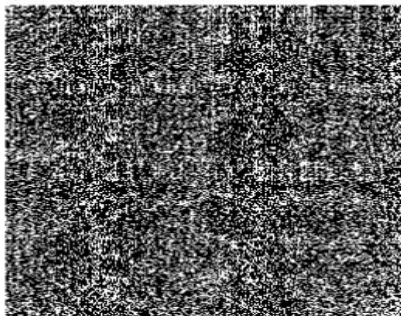
# convert class vectors to binary class matrices
train_labels = keras.utils.to_categorical(train_labels, num_classes)
test_labels = keras.utils.to_categorical(test_labels, num_classes)
model = keras.Sequential(
    [
        keras.Input(shape=input_shape),
        layers.Flatten(),
        layers.Dense(16, activation="sigmoid"),
        layers.Dense(16, activation="sigmoid"),
        layers.Dense(num_classes, activation="sigmoid"),
    ]
)
model.summary()
```

My Research:

Classifying Binary Data using Convolutional Neural Networks on Processed Byte Digraph Matrices

Mid Presentation

By James Oswald



Thank you for coming!