Keras Intro

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Keras

- Deep Learning framework
- Supports Multiple Backend
    - Theano (open source)
    - Tensorflow (Google)
    - CNTK (Cognitive Toolkit/MSFT)
- Can use CPU and GPU
- Supports Multi GPU
    - Tensorflow backend supports that
    - In case of, Theano - Need to verify.

Keras

- Pre processing
- Models
- Layers
- Misc.
  - Utils
  - Applications

Pre processing

- Images
  - img_to_array()
  - array_to_img()
- Texts

Models

- Two types of Models
  - Sequential Model
  - Model Class
- Attributes:
  - model.layers, model.inputs, model.outputs
- Methods:
  - Model.summary(), model.get_config()

Sequential Model

- Sequential model is a linear stack of layers
- from keras.models import sequential
- The first layer should define the shape of the input
    - input_shape(784,)
    - input_dim = 784

Models - flow

- Model = sequential()
- Add layers
- model.compile() # loss function
- model.fit() # training, epochs
- Model.evaluate()

Layers

- Core Layers
- Convolutional Layers
- Pooling Layers
- Normalization Layer
- Embedding Layer - Text application

Core Layers

- Dense :
- Flatten:
- Activation:
- Dropout:

Convolutional Layers

- Conv1D() / Conv2D() / Conv3D()
- ZeroPadding1D()

Pooling Layers

- MaxPooling1D() / 2D() / 3D()
- AveragePooling1D() / 2D() / 3D()
- GlobalMaxPooling1D() / 2D() / 3D()
- GlobalAveragePooling1D() / 2D() / 3D()

Normalization Layer

- BatchNormalization()

Embedding Layer

- Can be only first layer in the stack.
- Used for text application.
  - converting the vocabulary into numbers.

Keras Utils

- to_categorical()