The Open Source Society

In partnership with deeplearning.ai

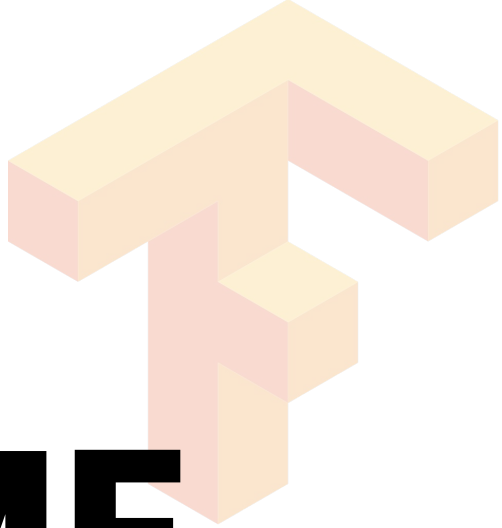
Pie & AI - BREAK INTO AI

Get Started with Tensorflow-Keras

AYUSHMAN KUMAR

Open Source Contributor at Tensorflow
Founder of The Open Source Society

Message from *Andrew Ng* and *DeepLearning.ai*



WELCOME

The
Open
Source
Society

A meetup hosted by deeplearning.ai community

Agenda

- What is Tensorflow?
- Why Tensorflow?
- Basics of Neural Network
- Visualize Neural Networks using Playground
- Translate Neural Network into Tensorflow
- tf.keras - models and layers
- Practical Demonstration (Regression and Classification using Neural Networks)
- Interactive Machine Learning (Teachable Machines)
- Q & A

What is Tensorflow?

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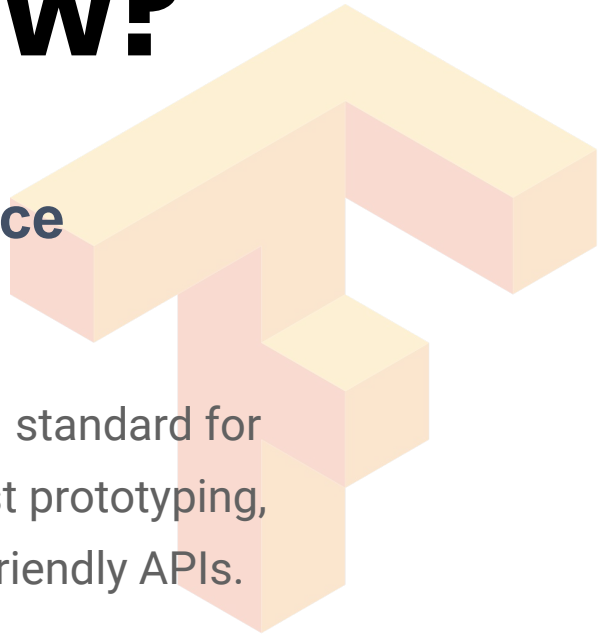

TensorFlow is an end-to-end open source platform for machine learning.

TensorFlow's high-level APIs are based on the Keras API standard for defining and training neural networks. Keras enables fast prototyping, state-of-the-art research, and production—all with user-friendly APIs.

src: tensorflow.org

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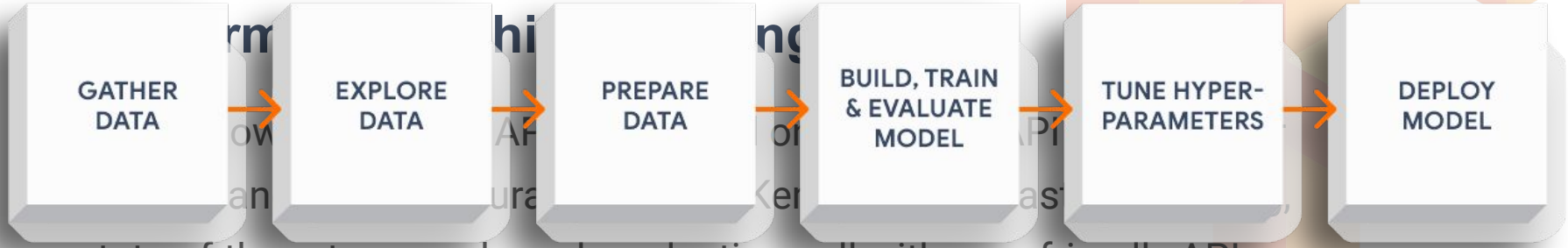

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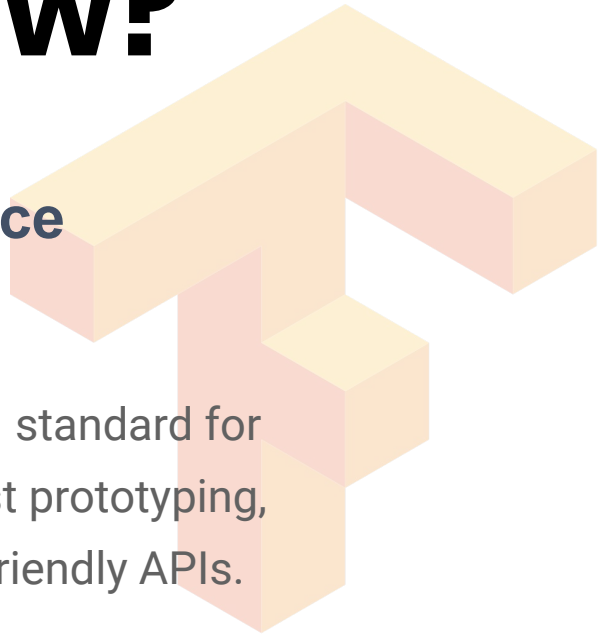

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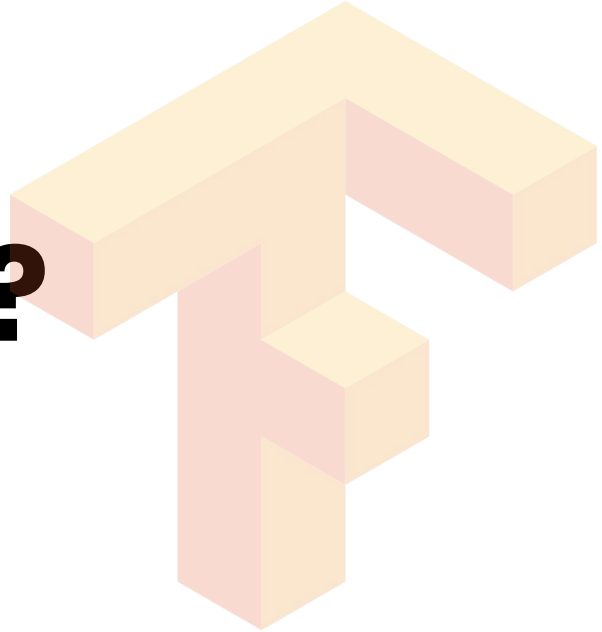
Why Tensorflow?



Why Tensorflow?

- Supported by Google.

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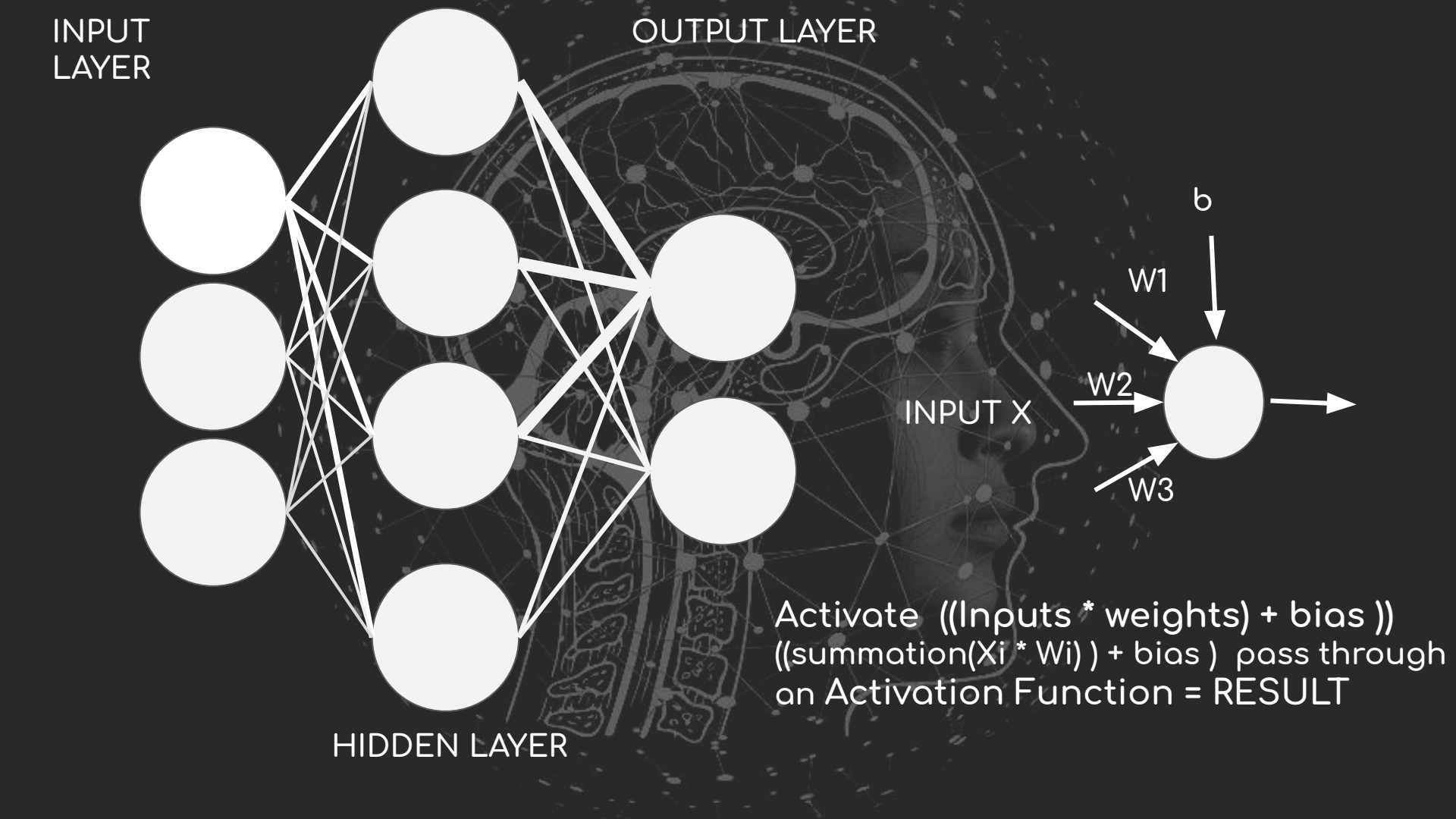
Why Tensorflow?

- Supported by Google.
- It's Open Source.
- One of the most Popular Machine Learning Library on Github.
- Enables you to use Machine Learning on Web, Android and Raspberry Pi.
- It's an **end-to-end** platform for Machine Learning applications.

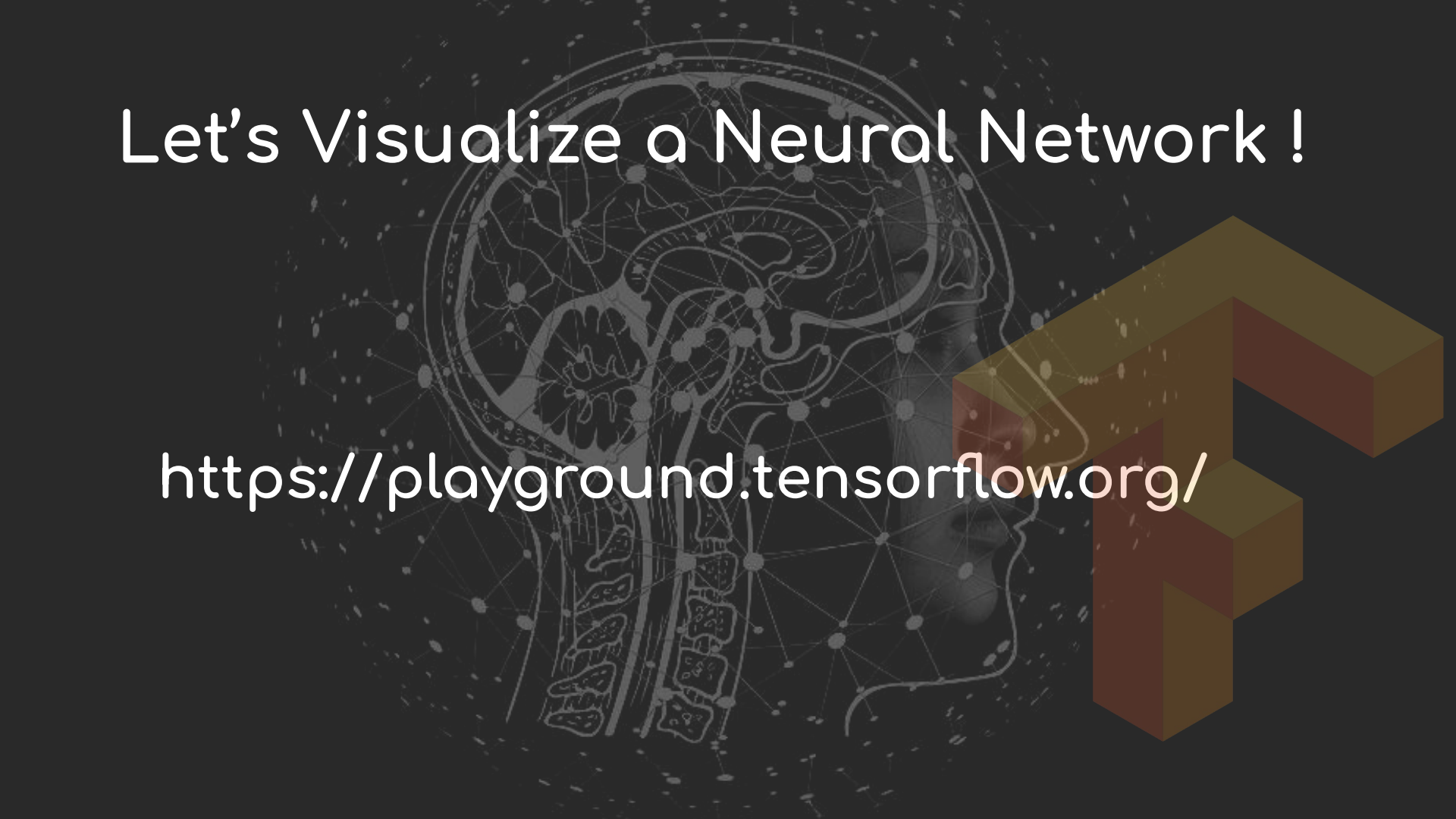

Prescribing antibiotics
using TensorFlow

Few Companies which uses Tensorflow

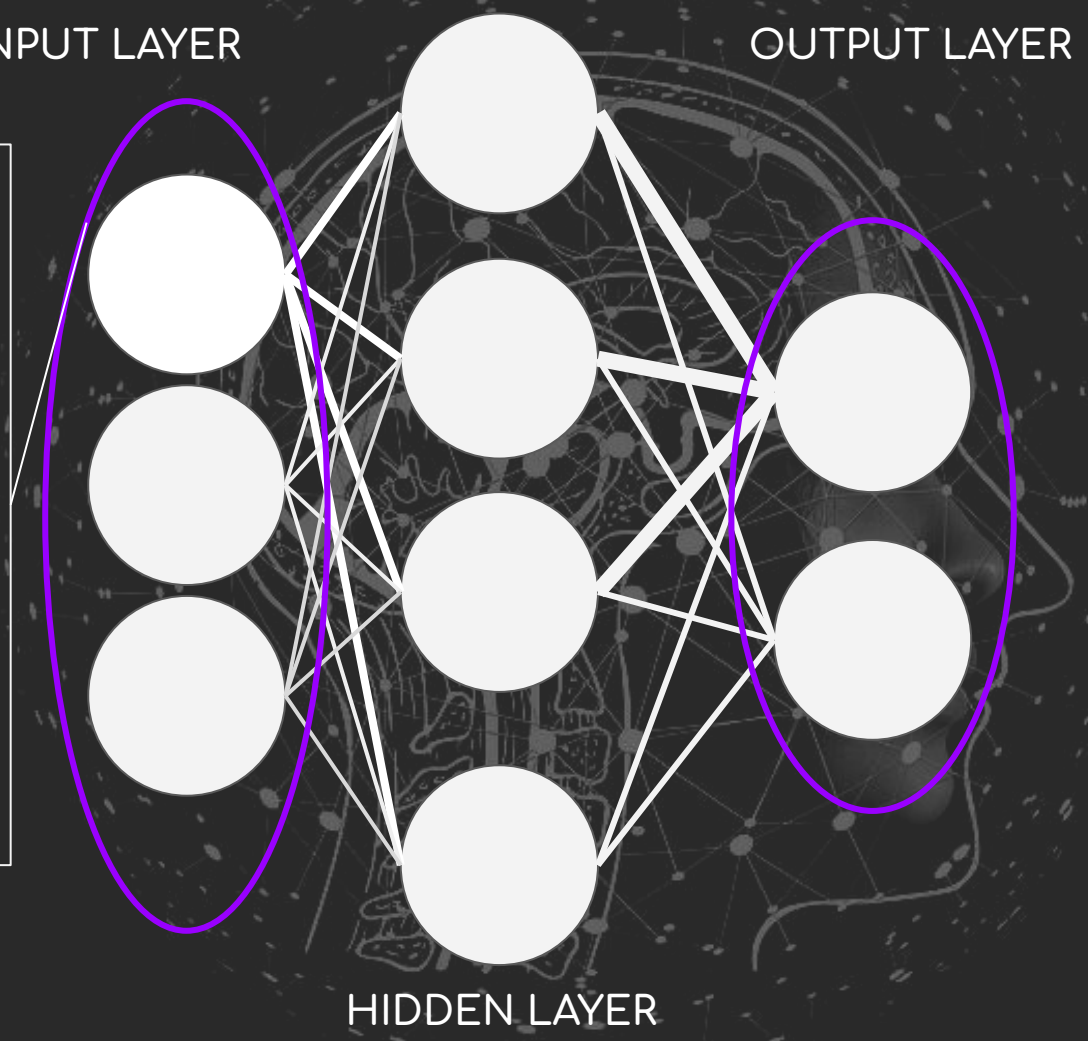
Steps to solve a Machine Learning Problem


INPUT
LAYER
OUTPUT LAYER
HIDDEN LAYER
INPUT X
b
W1
W2
W3
Activate ((Inputs * weights) + bias))
((summation(Xi * Wi)) + bias) pass through
an Activation Function = RESULT

Let's Visualize a Neural Network !



https://playground.tensorflow.org/



IN **tf.keras**, These layers are **DENSE** layers.

Each neuron is called **UNIT**

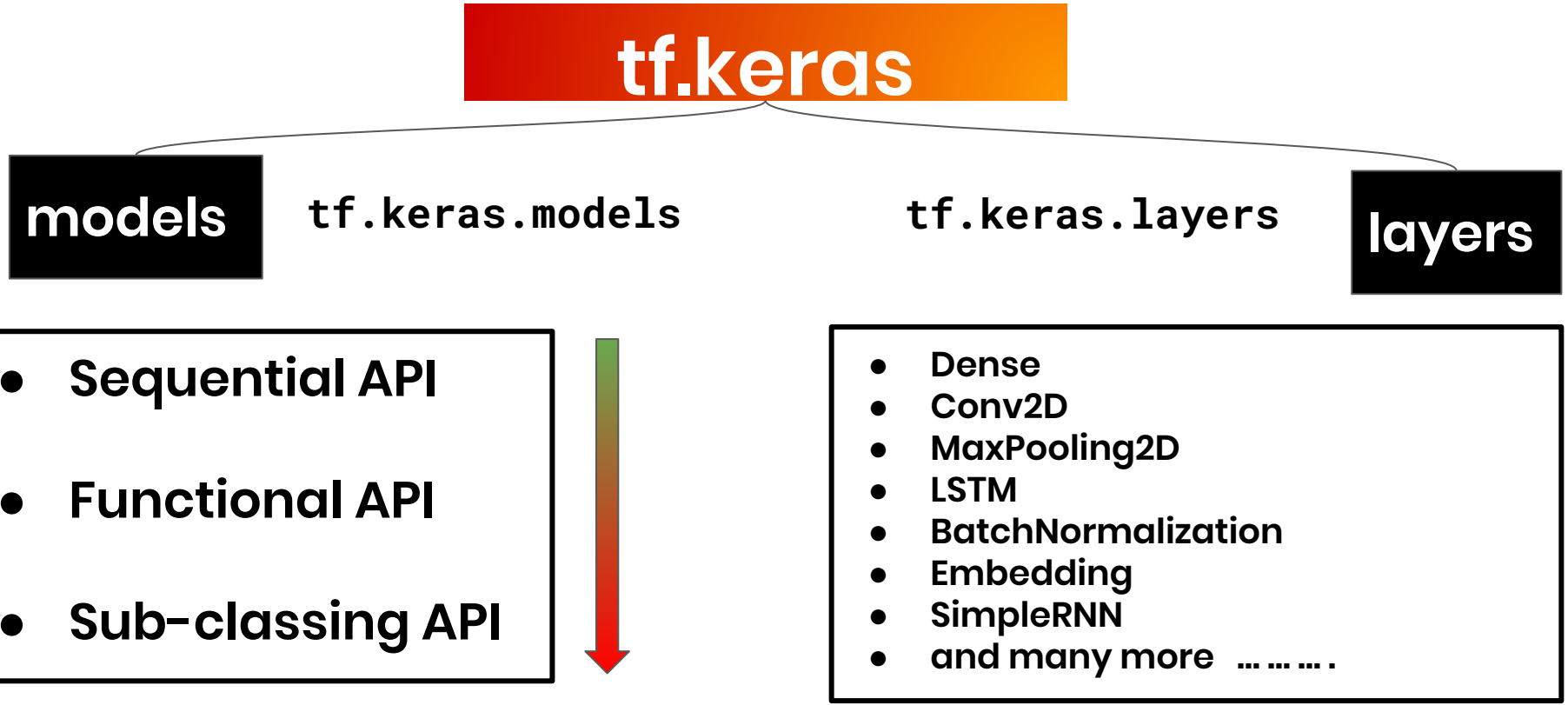
FOR CLASSIFICATION TASKS, NUMBER OF UNITS IN THE OUTPUT LAYER

=

NUMBER OF CLASSES

(Here 2 units, i.e, 2 classes(Binary Classification))

BUILDING NEURAL NETWORKS WITH tf.keras



```
model = tf.keras.models.Sequential()  # Step 1
# Step 2
model.add( tf.keras.layers.Dense(units = 10,
                                 activation = 'relu'))
model.add( tf.keras.layers.Dense(1) )

# Step 3
model.compile( loss = 'mse', optimizer = 'adam' )

# Step 4
model.fit(X_train, y_train, epochs = 100)
```

```
model
# Step
model.

model.

# Step
model.

# Step
model.
```

```
lu'))

)
```

Albert Einstein: Insanity Is Doing the Same Thing Over and Over Again and Expecting Different Results

Machine learning:

```
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# Step 3
model.compile( loss = 'mse', optimizer = 'adam' )

# Step 4
model.fit(X_train, y_train, epochs = 100)
```

Let’s run our Code !

```
# Classification task
10 Classes
model.add(tf.keras.layers.Dense(10,
                        activation = 'softmax'))

model.compile( loss = 'sparse_categorical_crossentopy'
                  Optimizer = 'adam'  )
2 classes
model.add(tf.keras.layers.Dense(1,
                        activation = 'sigmoid'))

model.compile( loss = 'binary_crossentopy'
                  Optimizer = 'adam'  )
```

Let’s run our Code !

Teachable Machine

- Performs 3 tasks - Pose Estimation, Image Classification, Audio model.
- It's made with Tensorflow.js .
- Enables you to download trained model and use it in your projects.

https://teachablemachine.withgoogle.com/


THANK YOU

Q and A

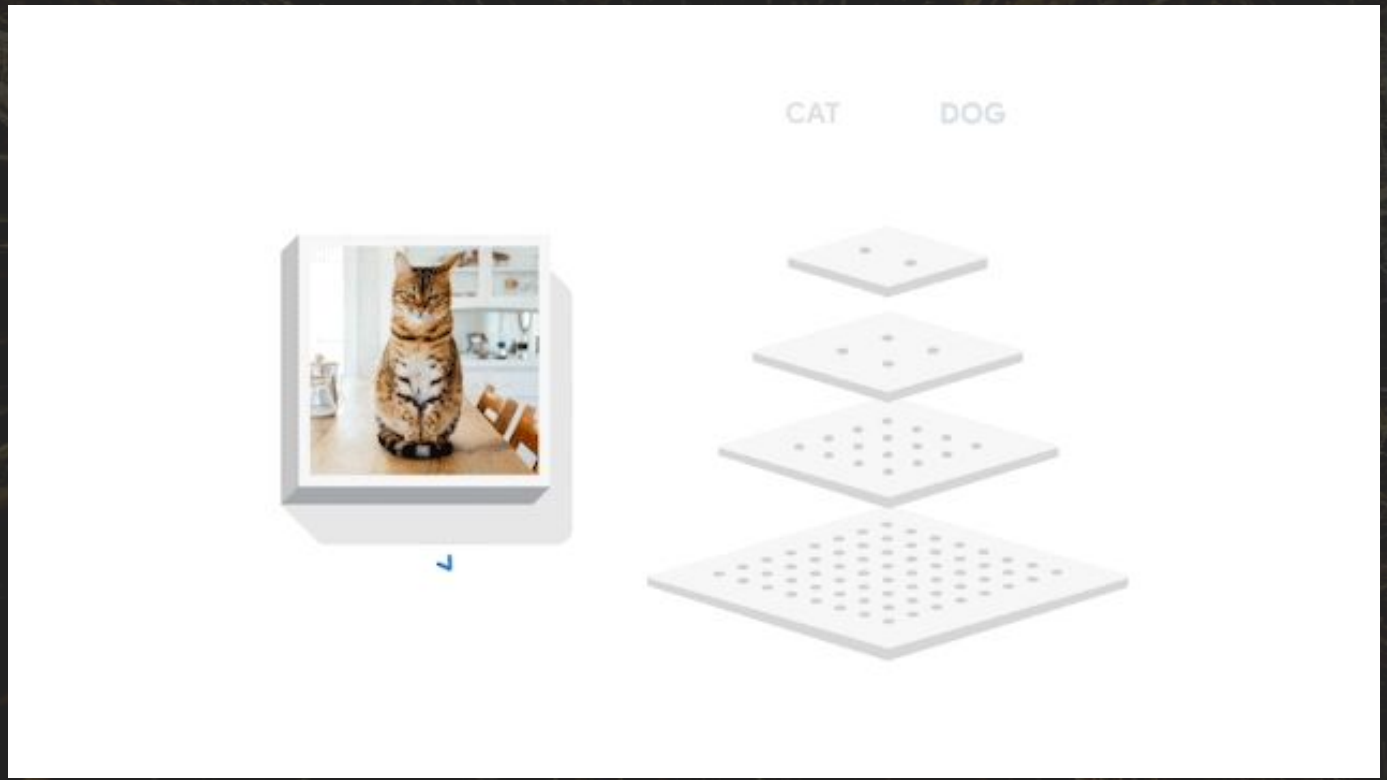
https://forms.gle/gKVi9iT8K8jZEdvd7

Albert Einstein: Insanity Is Doing the Same Thing Over and Over Again and Expecting Different Results

Machine learning:


STILL WAITING
FOR MY NEURAL NETWORK TO TRAIN
memegenerator.net

CONVOLUTIONAL NEURAL NETWORKS



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