

The  
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Source  
Society

In partnership  
with



# Pie & AI – BREAK INTO AI


## Get Started with Tensorflow–Keras



**AYUSHMAN KUMAR**

Open Source Contributor at Tensorflow  
Founder of The Open Source Society



A decorative background element consisting of several concentric circles in shades of gray, centered on the left side of the slide.

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





# WELCOME



The  
Open  
Source  
Society



# 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



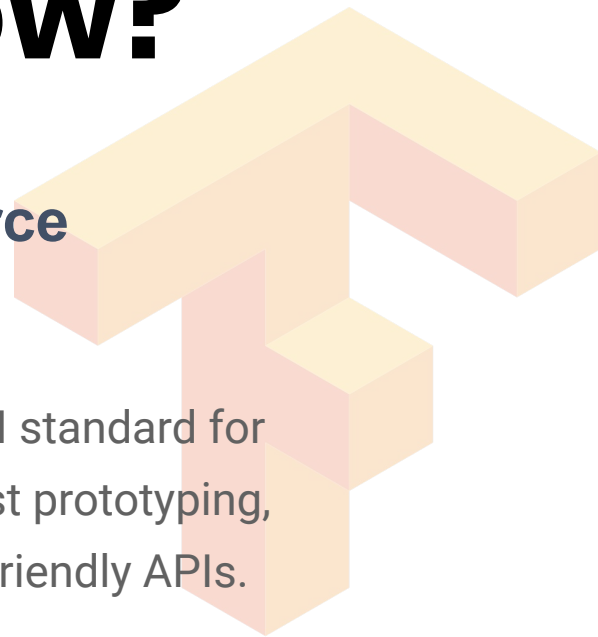
# What is Tensorflow?



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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](https://src.tensorflow.org)



# What is Tensorflow?

TensorFlow is an end-to-end open source



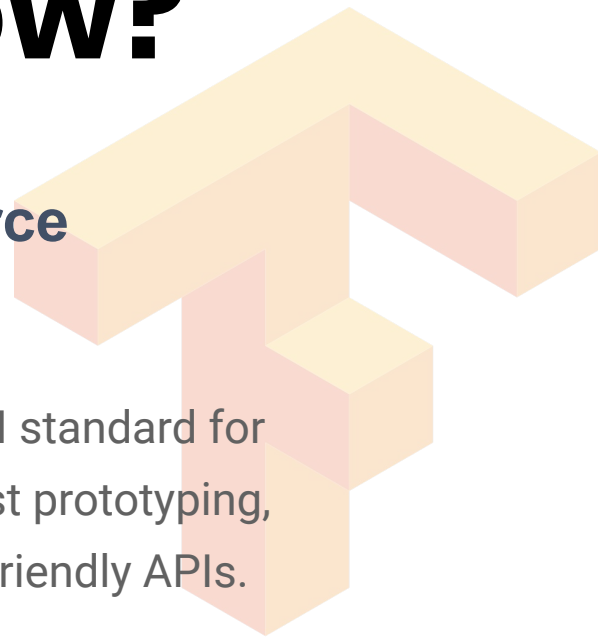
src: [tensorflow.org](https://www.tensorflow.org)



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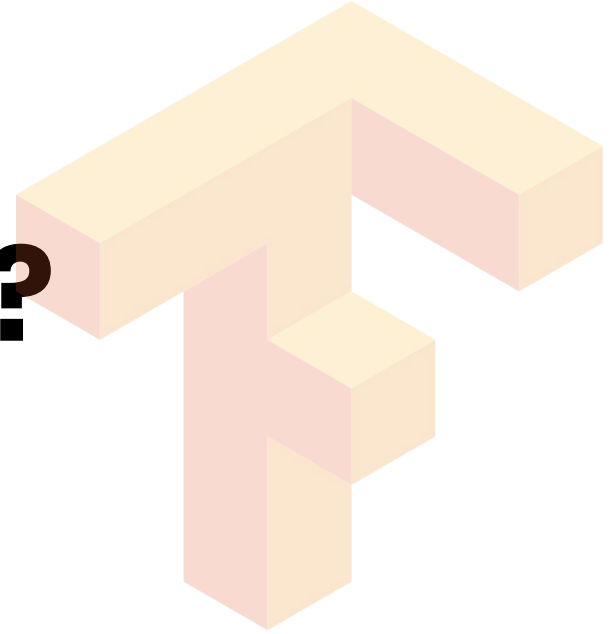


[src: tensorflow.org](https://src.tensorflow.org)





# Why Tensorflow?



# Why Tensorflow?

- Supported by Google.



# W

- Su



# Why Tensorflow?

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- It's Open Source.



# Why Tensorflow?

- Supported by Google.
- It's Open Source.
- One of the most Popular Machine Learning Library on Github.



# 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



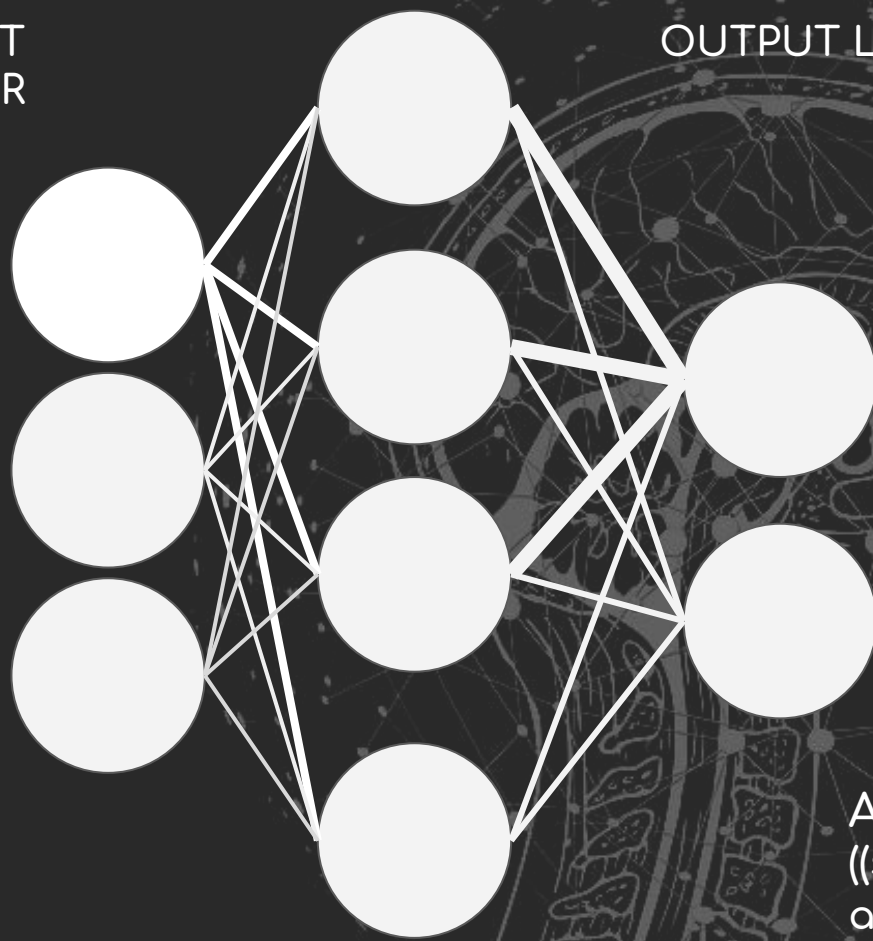


# Steps to solve a Machine Learning Problem



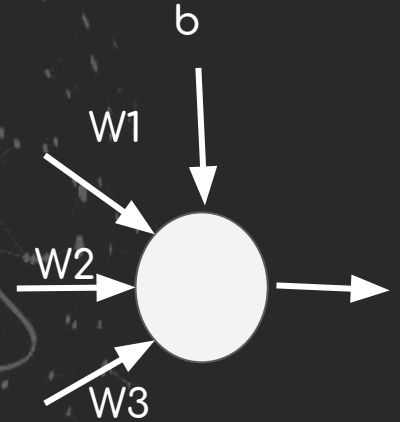
INPUT  
LAYER

OUTPUT LAYER



HIDDEN LAYER

INPUT X



Activate  $((\text{Inputs} * \text{weights}) + \text{bias})$   
 $((\text{summation}(X_i * W_i)) + \text{bias})$  pass through  
an Activation Function = RESULT

# Let's Visualize a Neural Network !

<https://playground.tensorflow.org/>



INPUT LAYER

OUTPUT LAYER

HIDDEN LAYER

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



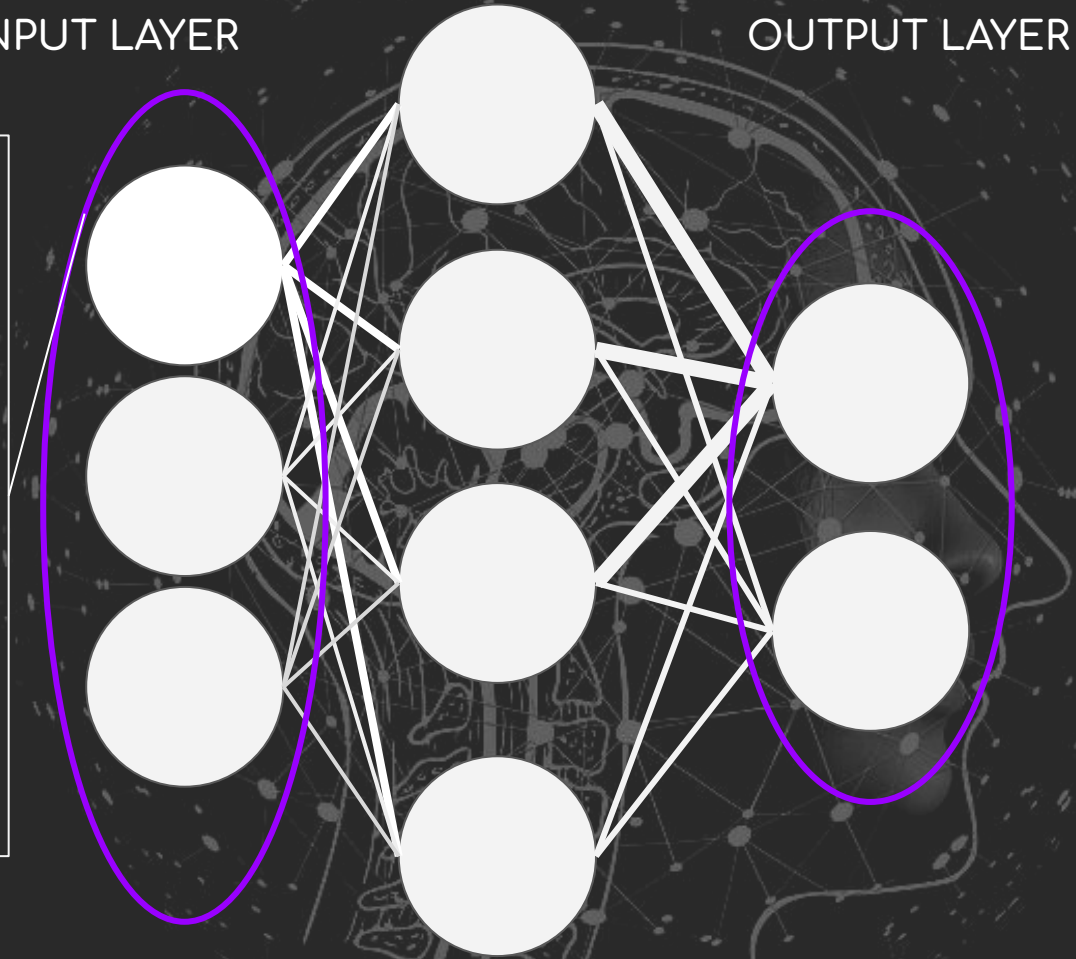
Each neuron is  
called  
**UNIT**

FOR  
CLASSIFICATION  
TASKS,  
NUMBER OF  
UNITS IN THE  
OUTPUT LAYER

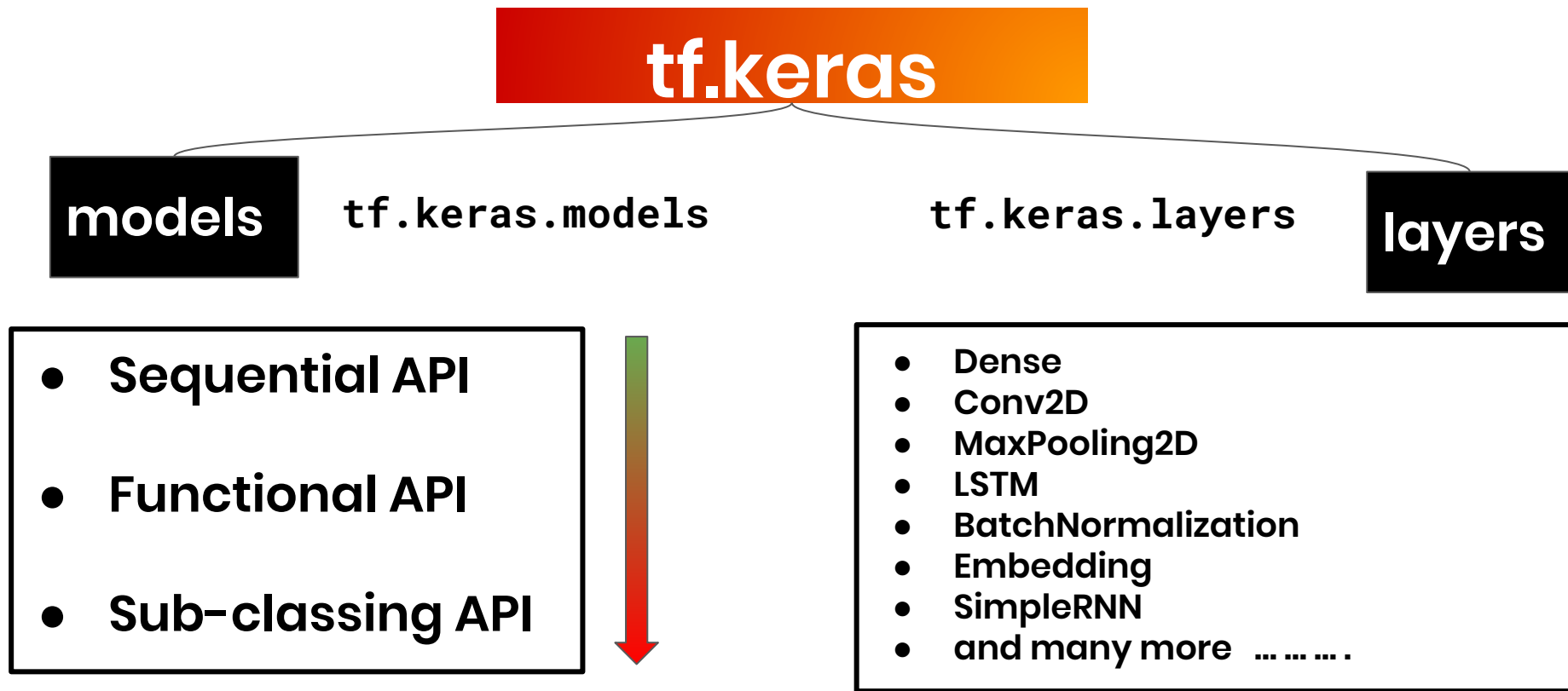
=

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)
```

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

Machine learning:



```
model = tf.keras.models.Sequential()    # Step 1
# Step 2
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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_crossentropy'  
              Optimizer = 'adam' )
```

### 2 classes

```
model.add(tf.keras.layers.Dense(1,  
                                activation = 'sigmoid'))
```

```
model.compile( loss = 'binary_crossentropy'  
              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/>

The background is a dark, textured composition. On the right side, there is a faint, light-colored silhouette of a human head in profile, facing right. Overlaid on and around this silhouette is a complex network of thin, golden-yellow lines that resemble neural connections or a web. These lines are interspersed with small, glowing golden dots. The overall effect is one of intricate, organic complexity.

**THANK YOU**



# Q and A



The background is a dark, textured surface. On the right side, there is a faint, golden-colored profile of a woman's face, looking towards the left. Overlaid on this and the entire background are numerous thin, golden, thread-like lines that resemble particle tracks or a complex network. These lines are more concentrated around the woman's profile and radiate outwards across the dark field.

<https://forms.gle/gKVi9iT8K8jZEvdvd7>

Albert Einstein: Insanity Is Doing  
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and Expecting Different Results

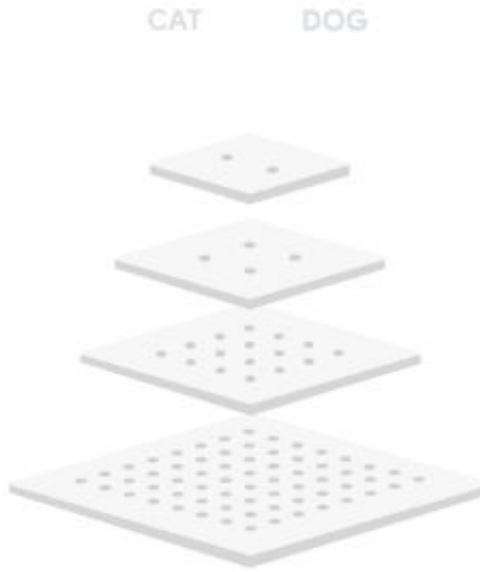
Machine learning:







# CONVOLUTIONAL NEURAL NETWORKS





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A meetup hosted by deeplearning.ai community

