

# Congratulations!



## ML Workflow



Course 1

Course 2

Course 3

## ML Workflow

Collect  
Data

Preprocess  
Data

Design a  
Model

Train a  
Model

Evaluate  
Optimize

Convert  
Model

Deploy  
Model

Make  
Inferences

Course 1

Course 2

Course 3

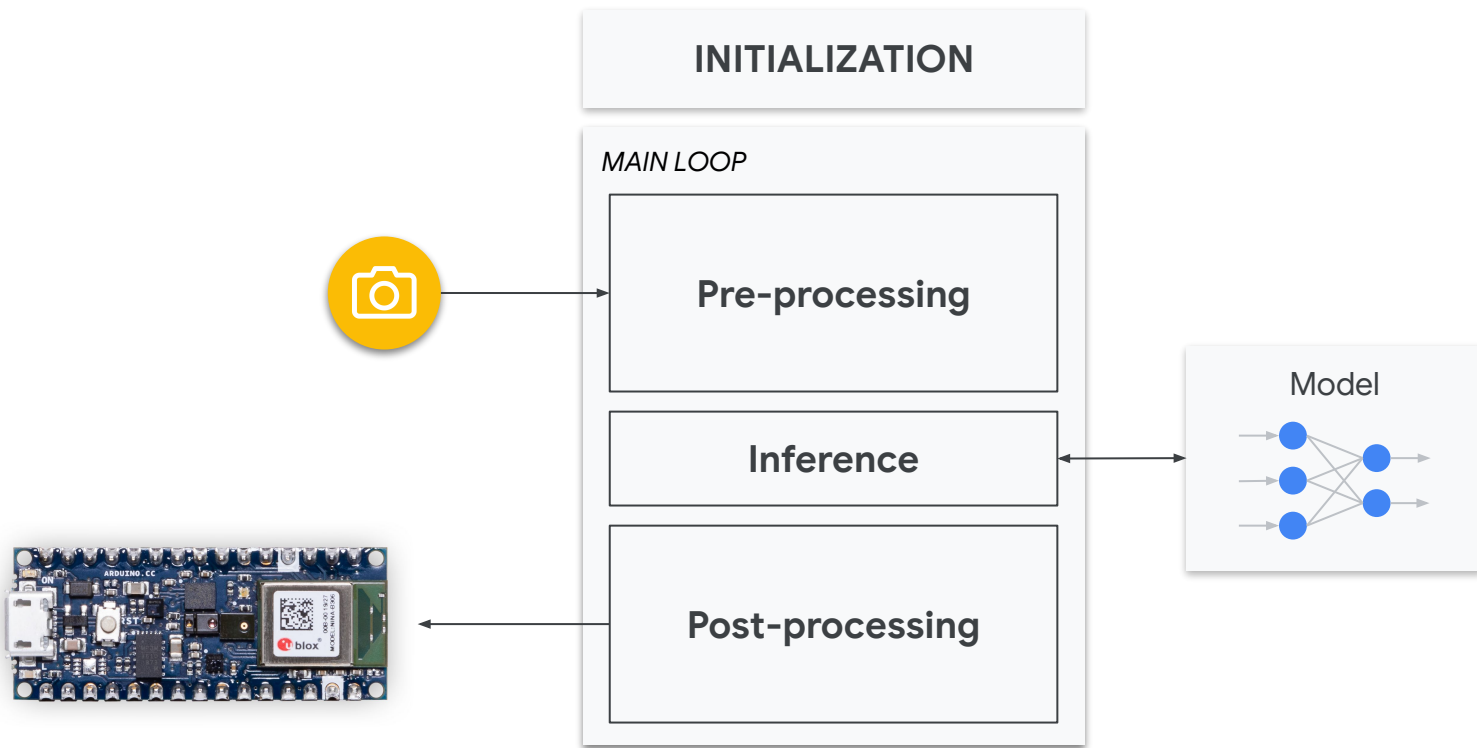
# Takeaways from Deploying **TinyML**

1. Discovered a range of **TinyML** applications
2. Understood how to deploy end-to-end **TinyML** applications
3. Learned the code behind **TinyML** models

with

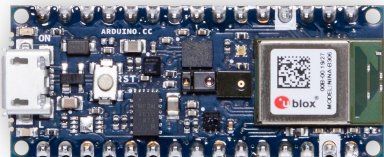
 TensorFlow Lite Micro

How to **structure** an  
application for deployment?



## TFLite Micro APIs

```
interpreter->  
invoke()
```



### INITIALIZATION

#### MAIN LOOP

Pre-processing

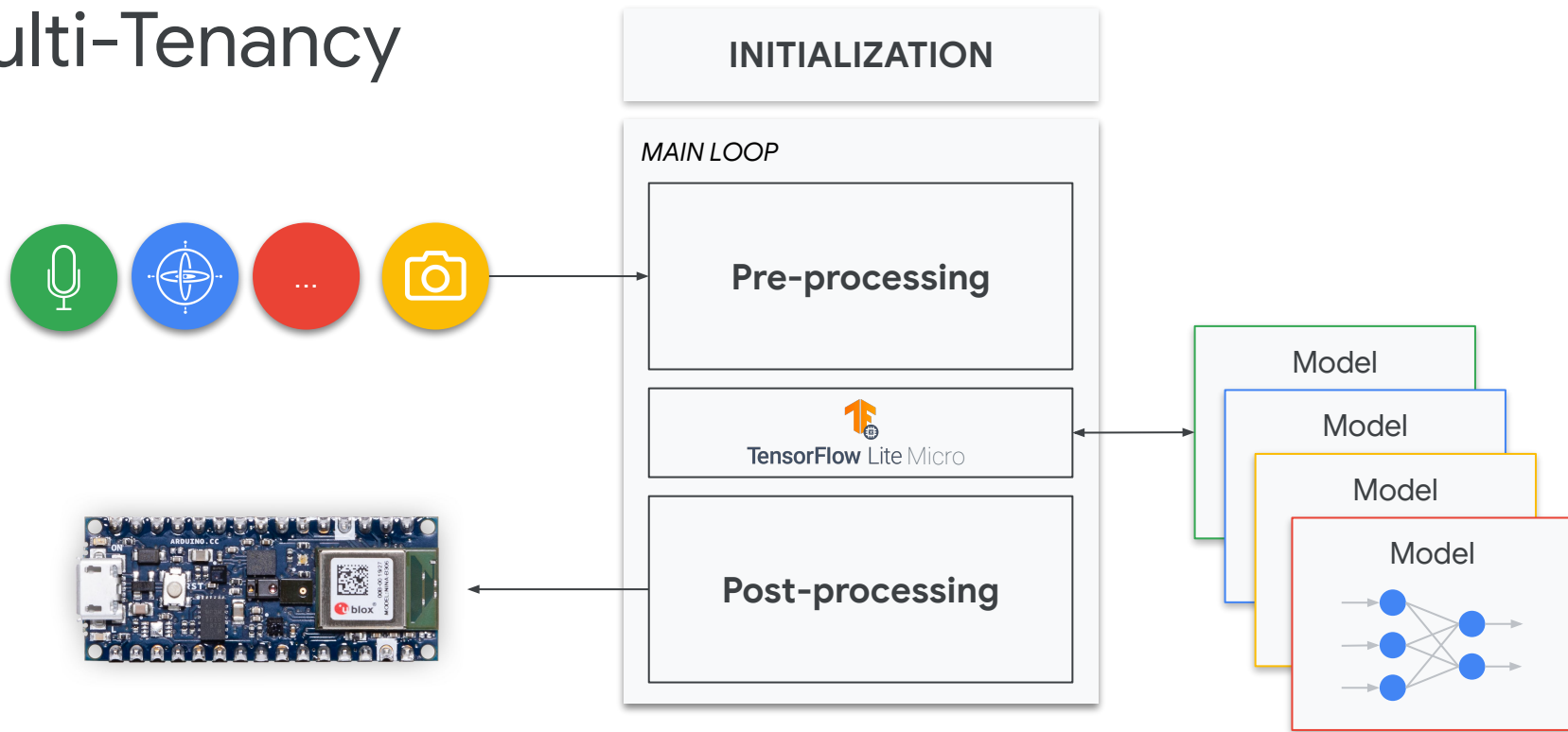
 TensorFlow Lite Micro

Post-processing

Model



# Multi-Tenancy

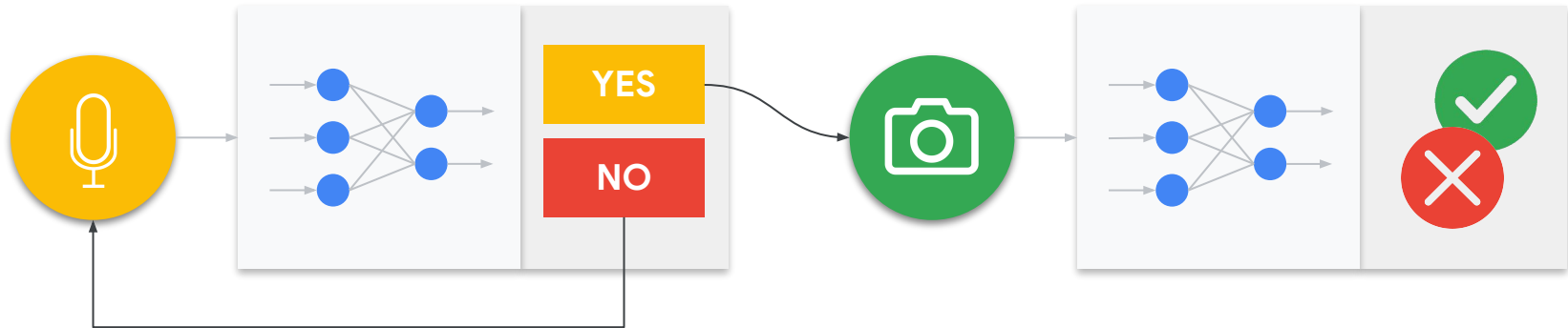




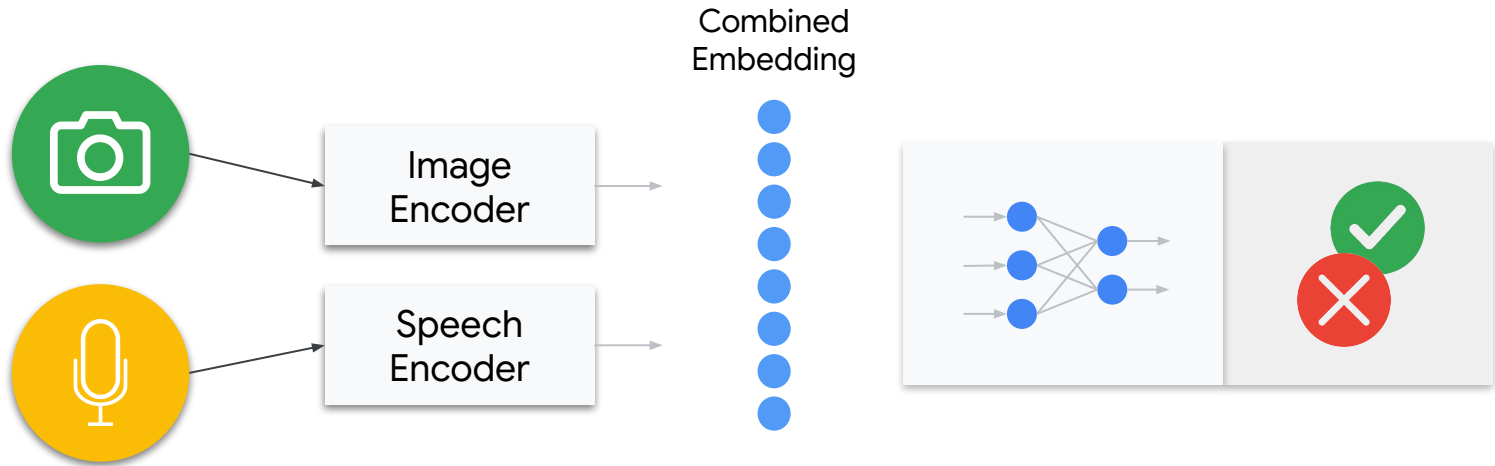
## MultiTenant ML Workflow



### Cascade Multi Tenant



## MultiModal ML Workflow



How to **deploy** a **TinyML**  
application?

## Sensors

### Acoustic Sensors

Ultrasonic, Microphones,  
Geophones, Vibrometers

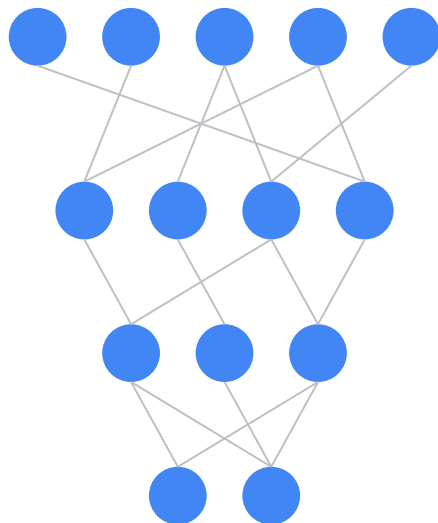
### Image Sensors

Infrared, Thermal, Image

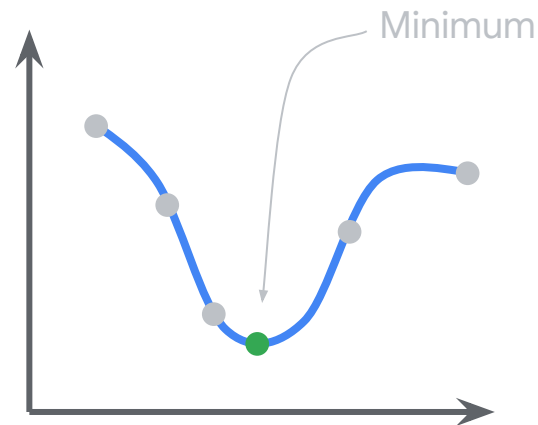
### Motion Sensors

Gyroscope, Radar,  
Accelerometer, IMU

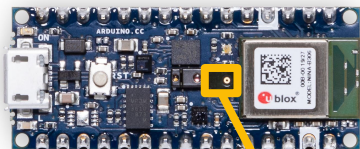
## Networks



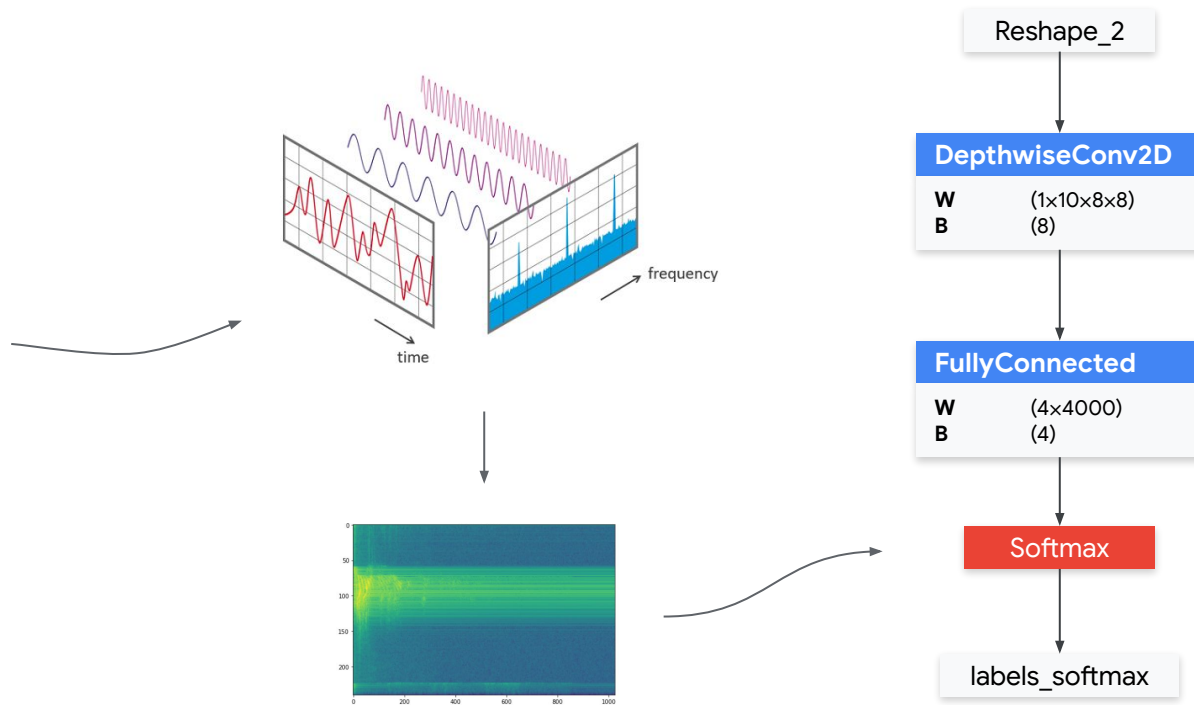
## Metrics



Course 3: End-to-end **TinyML** application deployment



Microphone



user says,

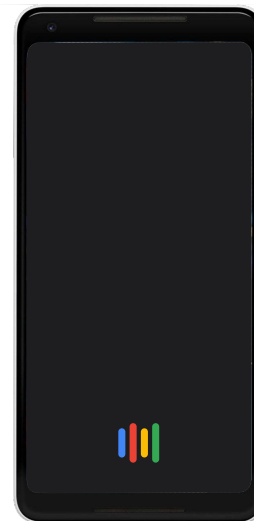
**“Upward!”**

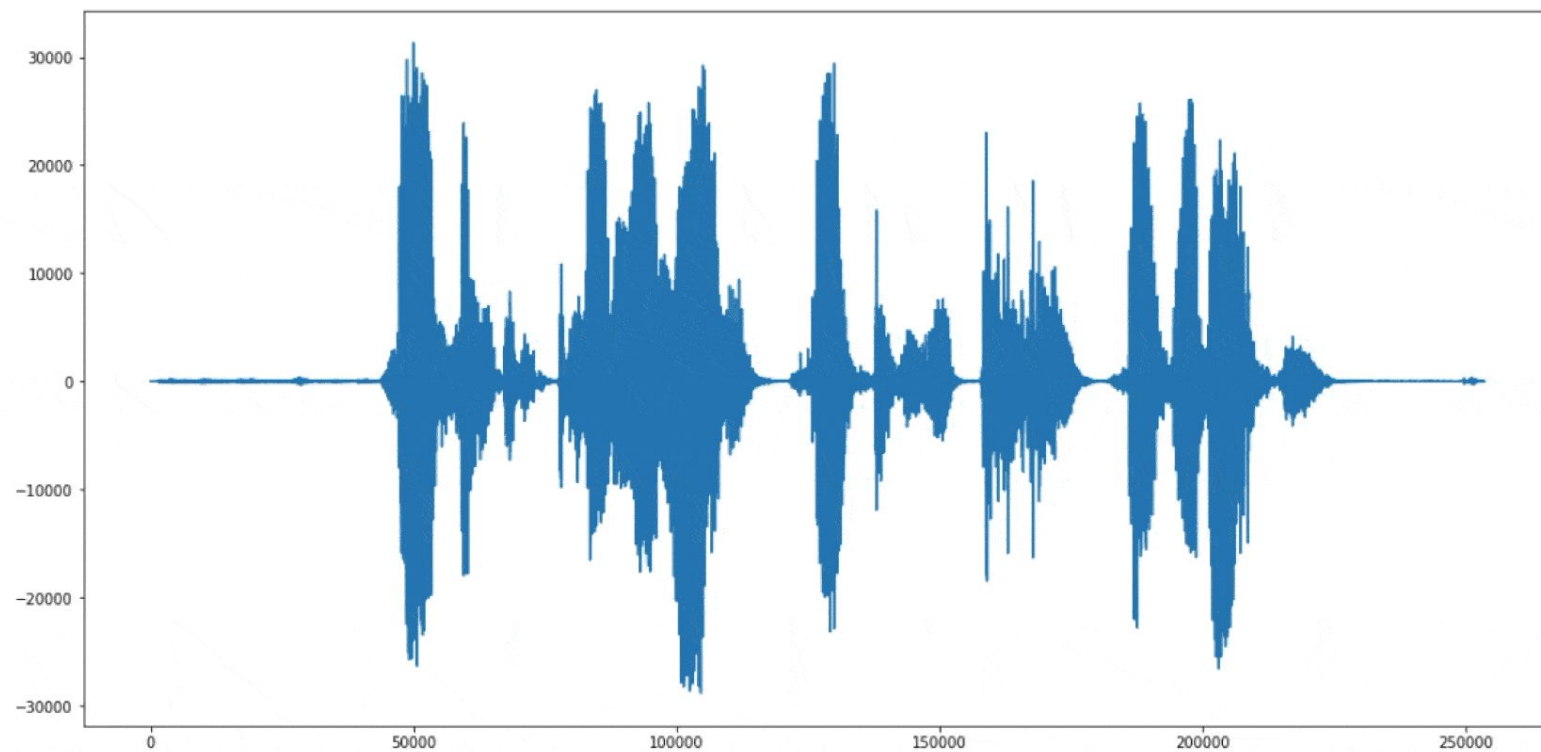
Command recognizer

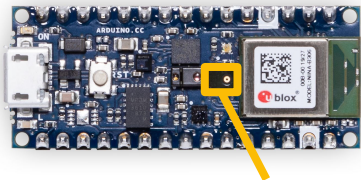
Command responder

Keyword

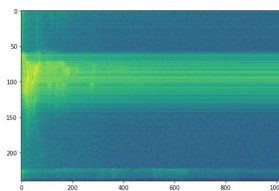
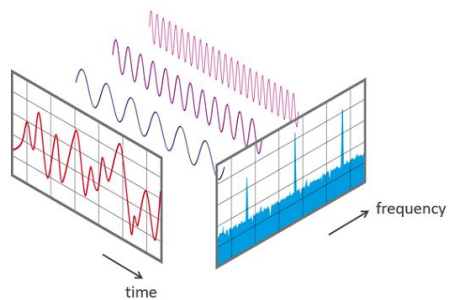
“Up”







Microphone



Reshape\_2

DepthwiseConv2D

**W** (1×10×8×8)  
**B** (8)

FullyConnected

**W** (4×4000)  
**B** (4)

Softmax

labels\_softmax



What are some emerging  
application **use cases**?

# Embedded Sensor **Ecosystem**



# Responsible AI: Human-Centered Design



## Course 1

*Fundamentals of TinyML*

- What am I building?
- Who am I building this for?
- What are the **consequences** for the user if it **fails**?

## Course 2

*Applications of TinyML*

- What **data** will be collected to train the model?
- Is the dataset **biased**?
- How can we **ensure** the model is **fair**?

## Course 3

*Deploying TinyML*

- How will **model drift** be monitored?
- How should **security breaches** be addressed?
- How should the user's **privacy** be protected?

# Takeaways from Deploying **TinyML**



Discovered a range of **TinyML** applications



Understood how to deploy end-to-end **TinyML** applications



Learned the code behind **TinyML** models

with



TensorFlow Lite Micro