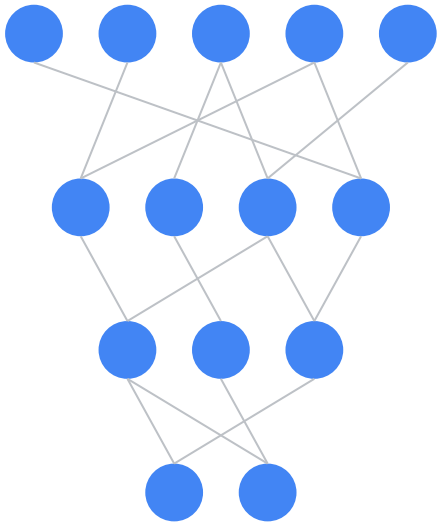
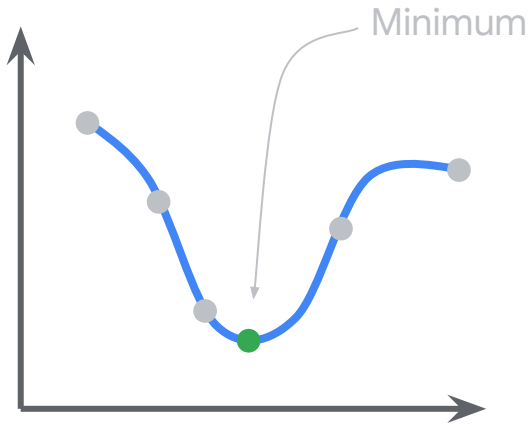
# What You'll Learn in Course 2

**Acoustic Sensors**
Ultrasonic, **Microphones**, Geophones, Vibrometers

**Image Sensors**
Thermal, **Image**

**Motion Sensors**
Gyroscope, Radar, **Accelerometer**






**Course 2:** End-to-end **TinyML** application design

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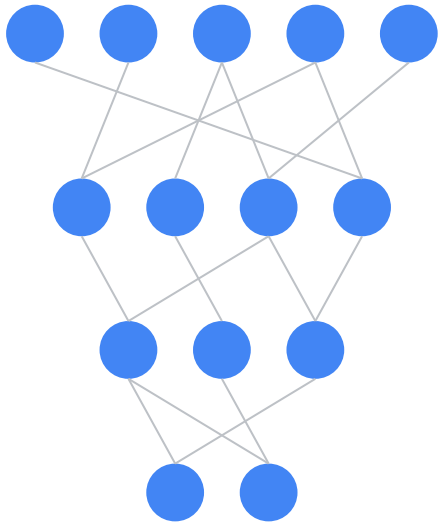
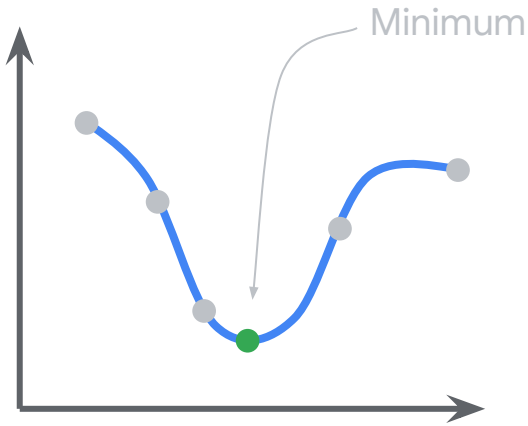
# Input **Signal Characteristics**

- What is ***different*** about these sensors?
- What is the difference in the ***modalities*** and the ***quantity*** of data?



# ML **Model Characteristics**

- What is should our networks **“learn”** for each ***different*** sensor?

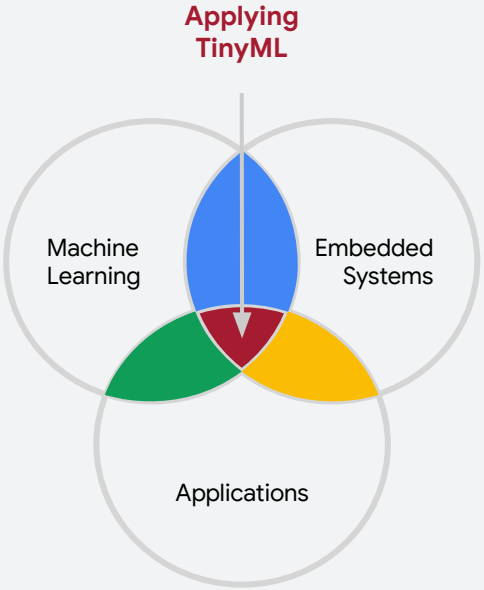



# Metric Characteristics

- What is our **goal** metric?
- Should we consider ***multiple*** metrics?
- More than the model (**resource constraints**)

# At the End of the Day

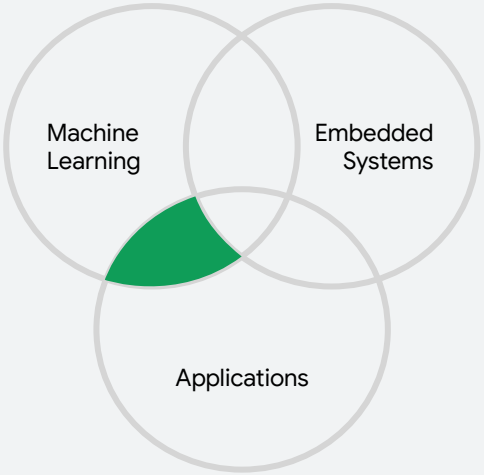
Given your understanding of things at these various intersections, you will have a deep understanding for **how to apply TinyML**



# Interactions

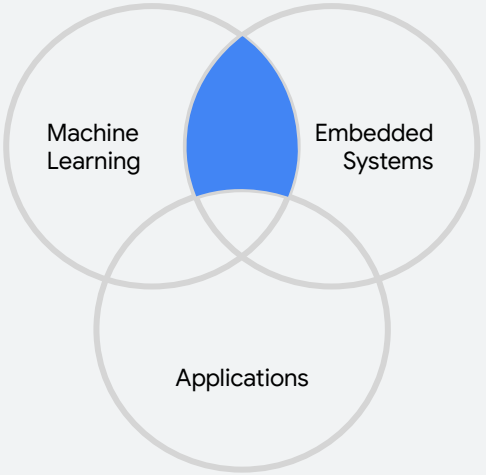
How **machine learning** can enable new and interesting **TinyML applications**?


Source: https://wildlabs.net/resources/competition/challenge-elephantedge



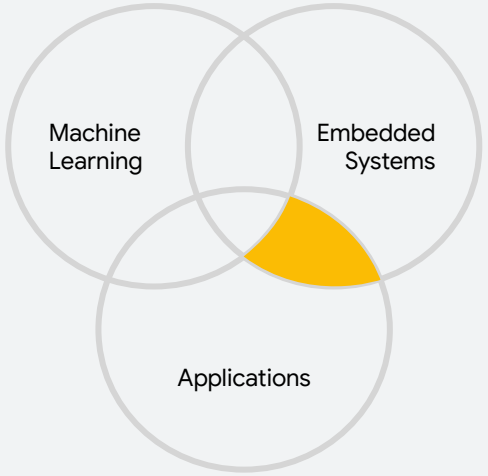
# Interactions

What are the **challenges** with enabling **machine learning** on **tiny**, resource-constrained **embedded devices**?



# Interactions

What type of new **use cases** can we possibly enable on **embedded systems** that we could not otherwise do before?



# Course Sequence

**Course 1**

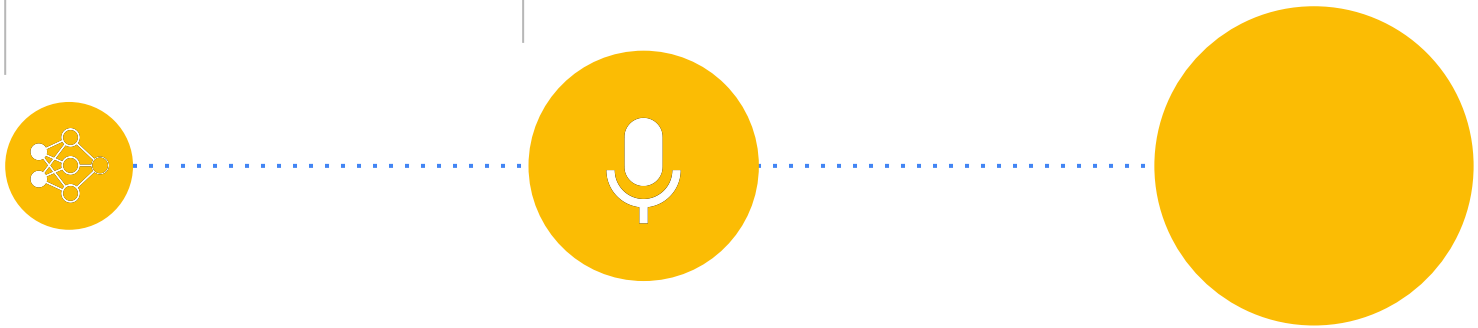
*Fundamentals of TinyML*

**Course 2**

*Applications of TinyML*

**Course 3**

*Deploying TinyML*



**Learning**

An introduction to a variety of TinyML applications and sensor types, along with a deep dive into how to build some of them (e.g., speech commands). You will learn the importance of dataset engineering and responsible AI methods.

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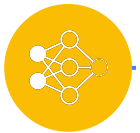

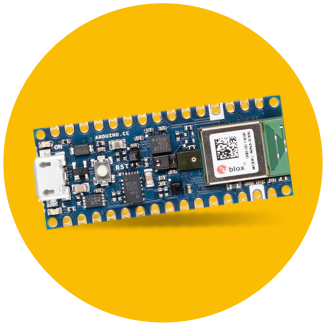

**Learning**

You will learn how to deploy models on a real microcontroller. Along the way you will explore the challenges unique to and amplified by TinyML (e.g., preprocessing, post-processing, dealing with resource constraints).