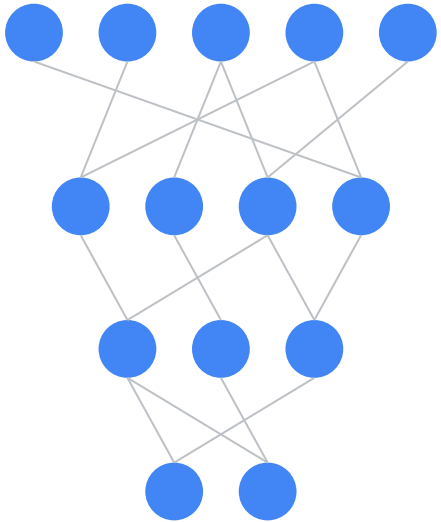
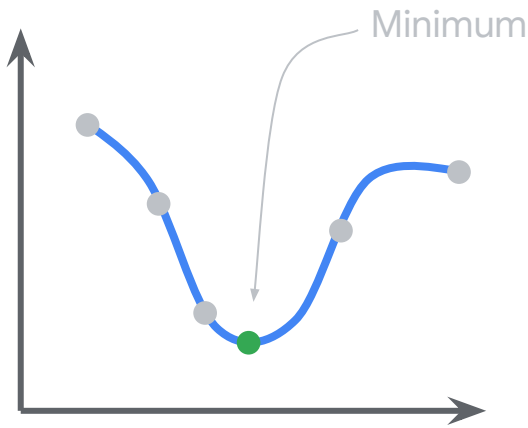
Building Blocks from Course 1 for Course 2

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

Image Sensors
Thermal, **Image**

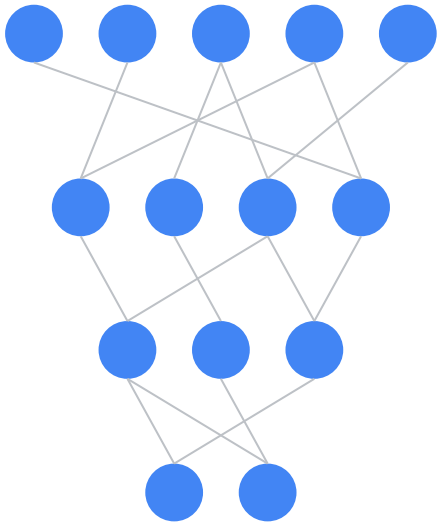
Motion Sensors
Gyroscope, Radar, **Accelerometer**





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

Total Recall from **Course 1**



“Language” from Course 1

Neural Network

Gradient Descent

Loss Function

Training Data

Training

Validation Data

Inference

Test Data

Features

Classification

Filters

Overfitting

Kernels

Regression

Data augmentation

CNNs

DNNs

Responsible AI

Preprocessing

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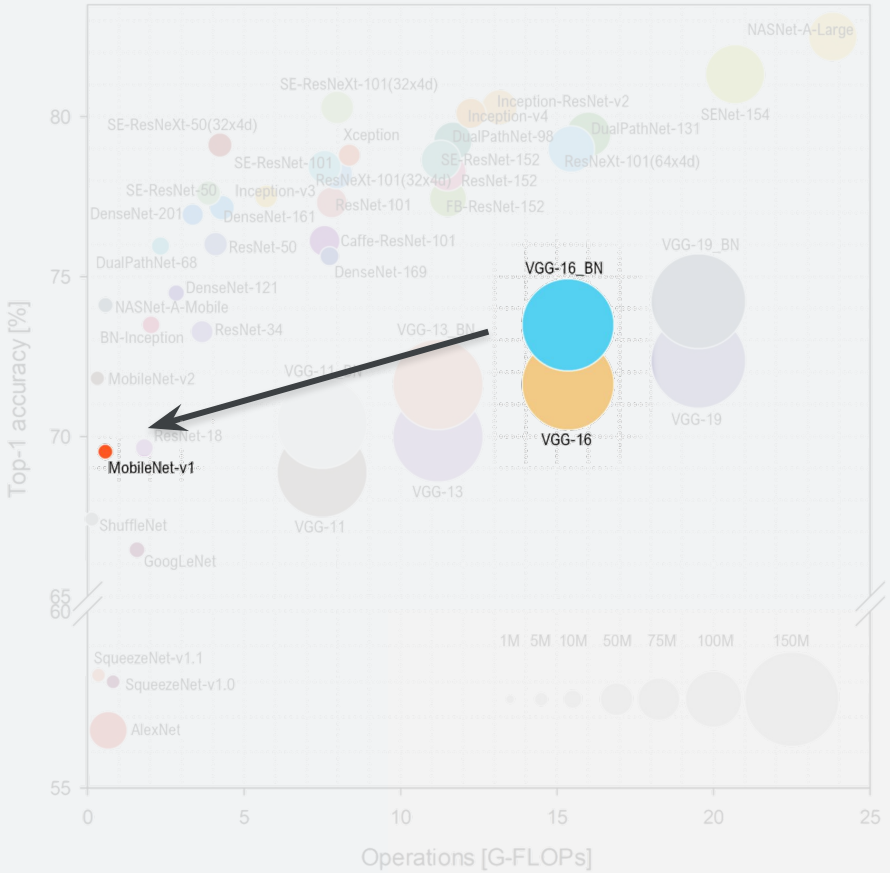
Ideas from Course 1

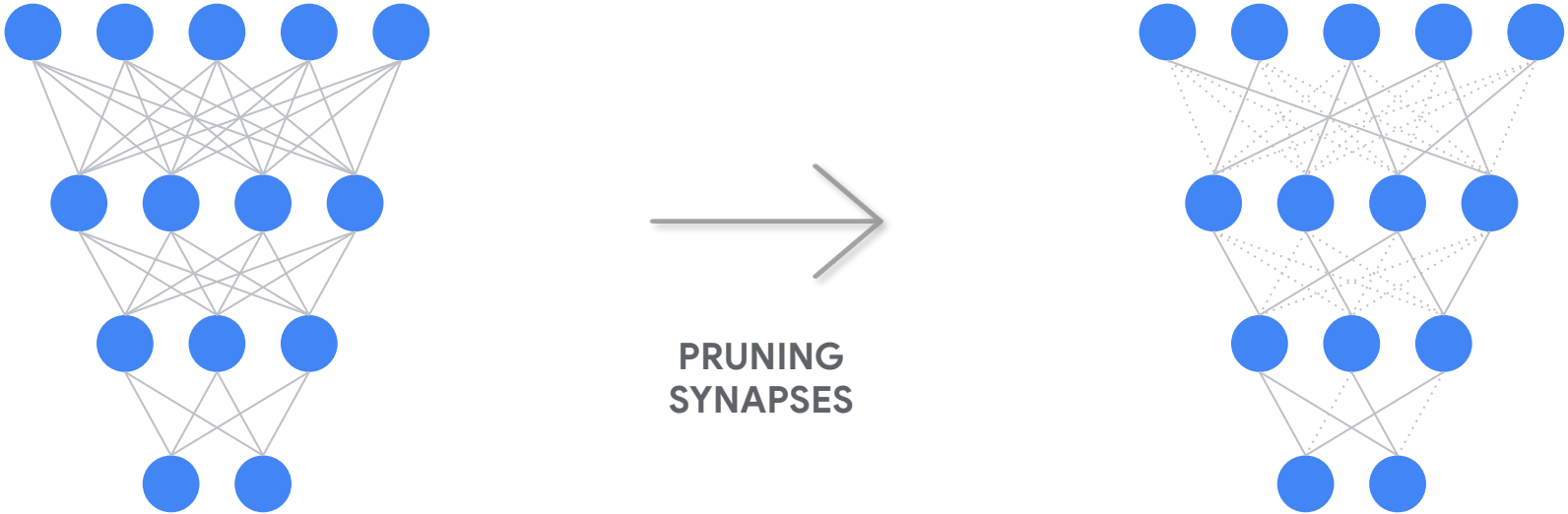
ML Model evolution:

- Small, accurate

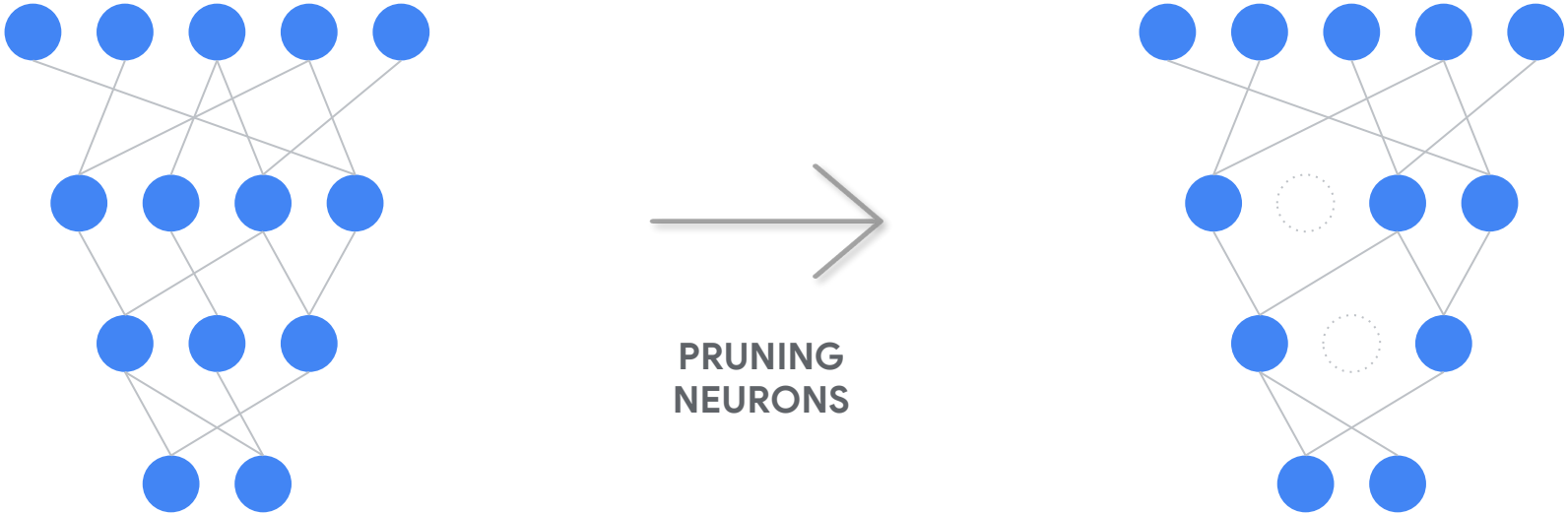


Source: S. Bianco, R. Cadene, L. Celona, and P. Napoletano, “Benchmark analysis of representative deep neural network architectures,” *IEEE Access*, vol. 6, pp. 64 270–64 277, 2018

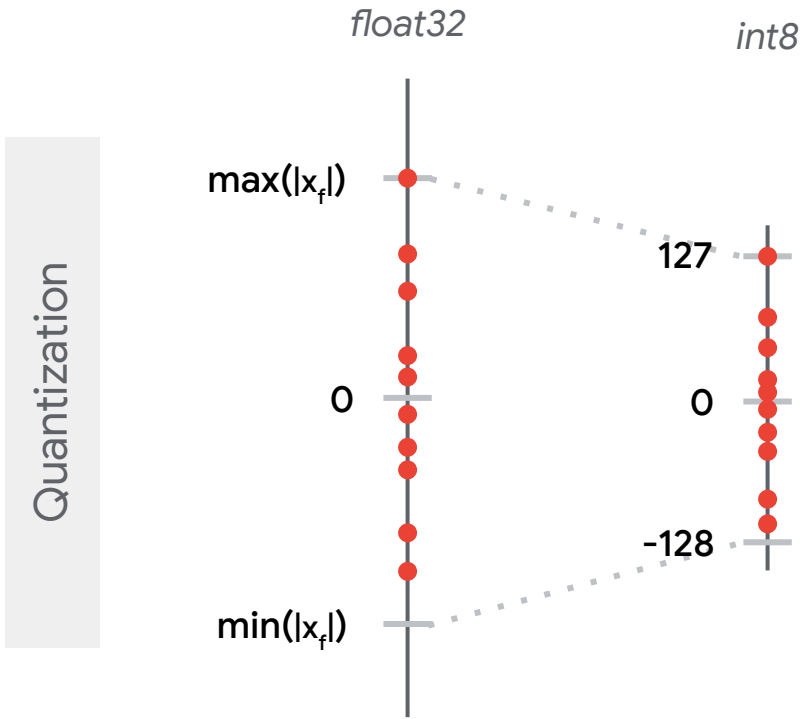
“Language” from Course 1



“Language” from Course 1



“Language” from Course 1



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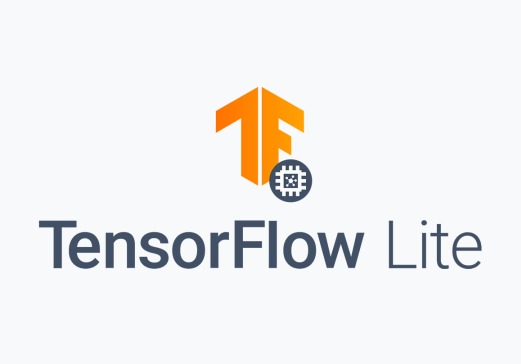

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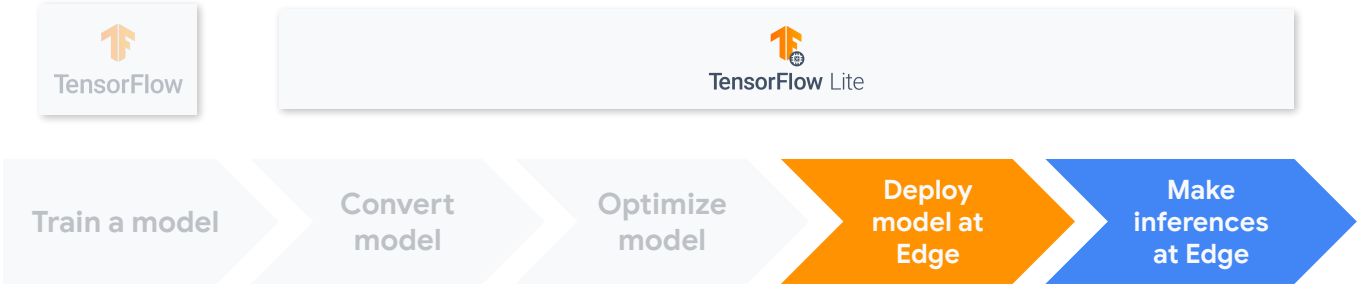
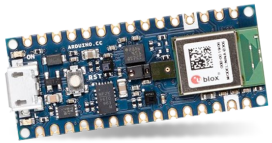
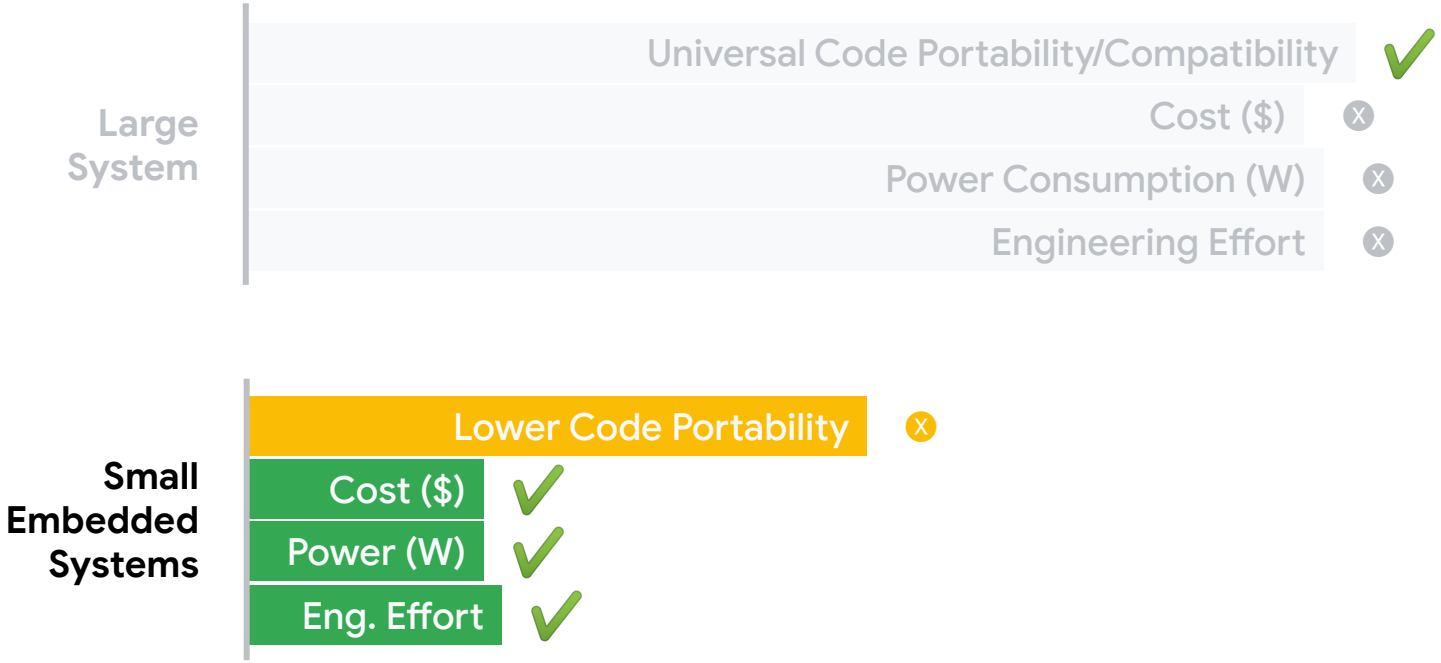




Microcontroller

“Language” from Course 1



Course Sequence

Course 1

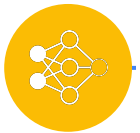
Fundamentals of TinyML

Course 2

Applications of TinyML

Course 3

Deploying TinyML



Learning

An introduction to Machine Learning (ML) with TensorFlow using the Colab programming environment. You will gain an understanding of how to design, develop, and use ML applications through the lens of Tiny Machine Learning.

Course Sequence

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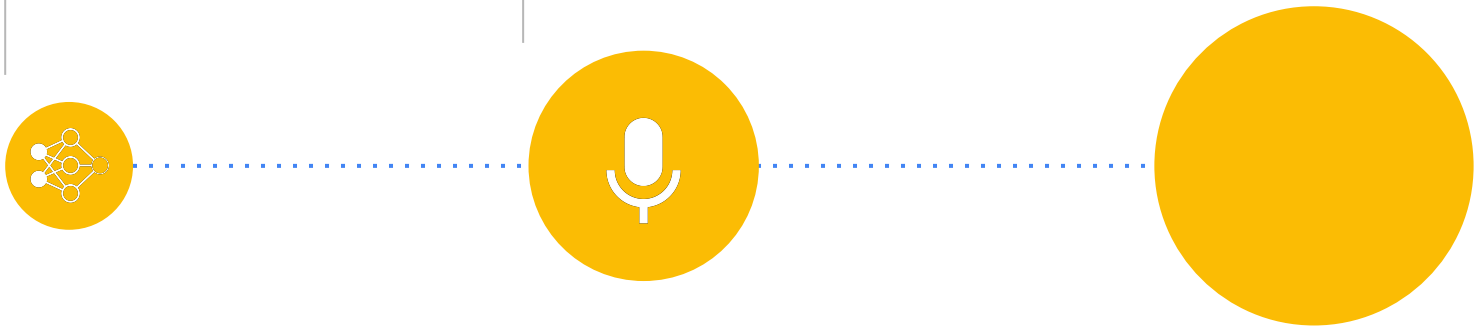

Learning

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.