

A black and white photograph showing two wind turbines against a dramatic, cloudy sky. The turbine on the left is in sharp focus, while the one on the right is slightly blurred, suggesting motion. The blades are positioned at different angles.

EMBEDDED AUDIO CLASSIFIER, AN APPLICATION OF DEEP LEARNING.

Yuge Wang

OVERVIEW OF THE PROJECT

- ▶ This is a deep learning project that aim to control the light switch and brightness by recognising and identifying five audio words.
- ▶ To embed the system into Arduino Nano development board and mobile devices which allow live classification.
- ▶ Most of the steps are completed using Edge Impulse.

STEPS OF PROJECT



**Data
Preparation**



**Model
architecture**



**Model
training**

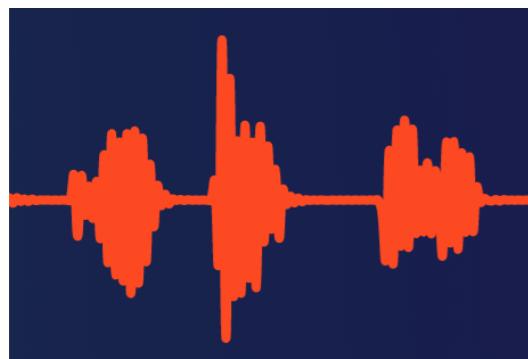


**Model
testing and
deployment**

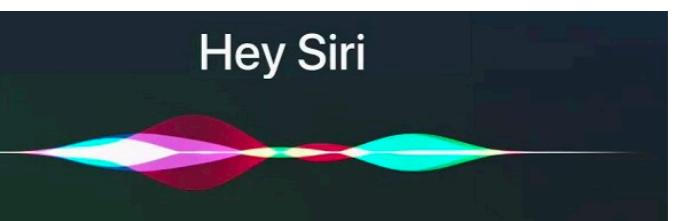
DATA PREPARATION

- ▶ Five categories:

1. Turn on, Dyson!



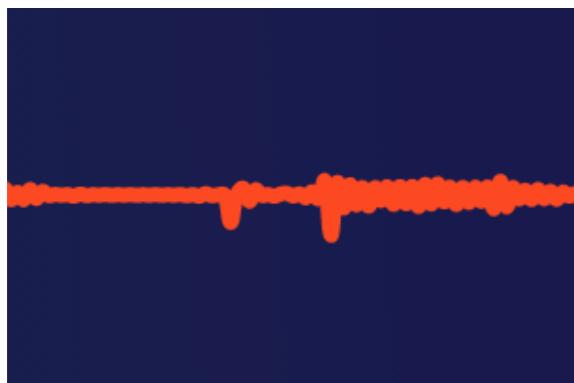
2. Turn off, Dyson!



3. Lighter, Dyson!



4. Silence



5. Noise



MODEL ARCHITECTURE

1. Input layer

Hold the raw pixel values

2. Reshape layer

3. First convolutional layer,
followed by a max pooling layer.

1D, 8 neurons, activation method: relu

4. Second convolutional layer,
followed by a max pooling layer.

1D, 16 neurons, activation method: relu

5. Flatten layer

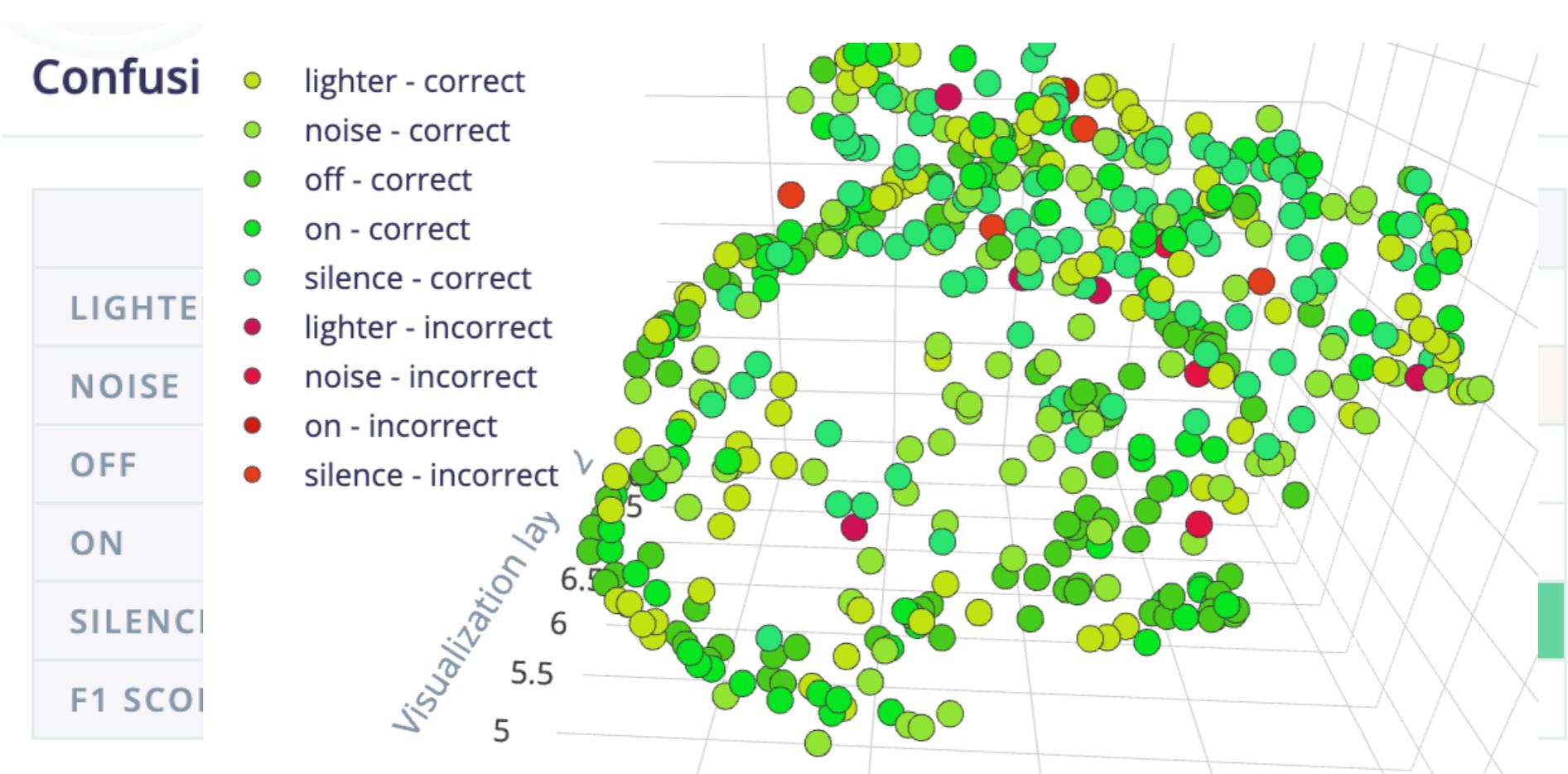
To convert pooled layer to a single array

6. Fully connected layer

Activation method: softmax

MODEL TRAINING

- ▶ Lastly, to train the model with epoch of 100.
- ▶ The result had given the accuracy is 85% with validation data set.



MODEL TESTING AND DEVICE DEPLOYMENT

