Cat Feeder
With Speech Command
-AIoT Course-

Student: LA NHAT HY
ID: 18120402

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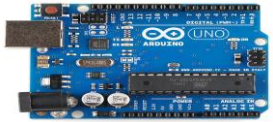
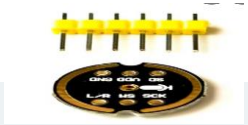
Introduction

Necessary device in The 4.0 Industrial Revolution:

- Time saving
- Efficiency
- Convenience

Components Datails

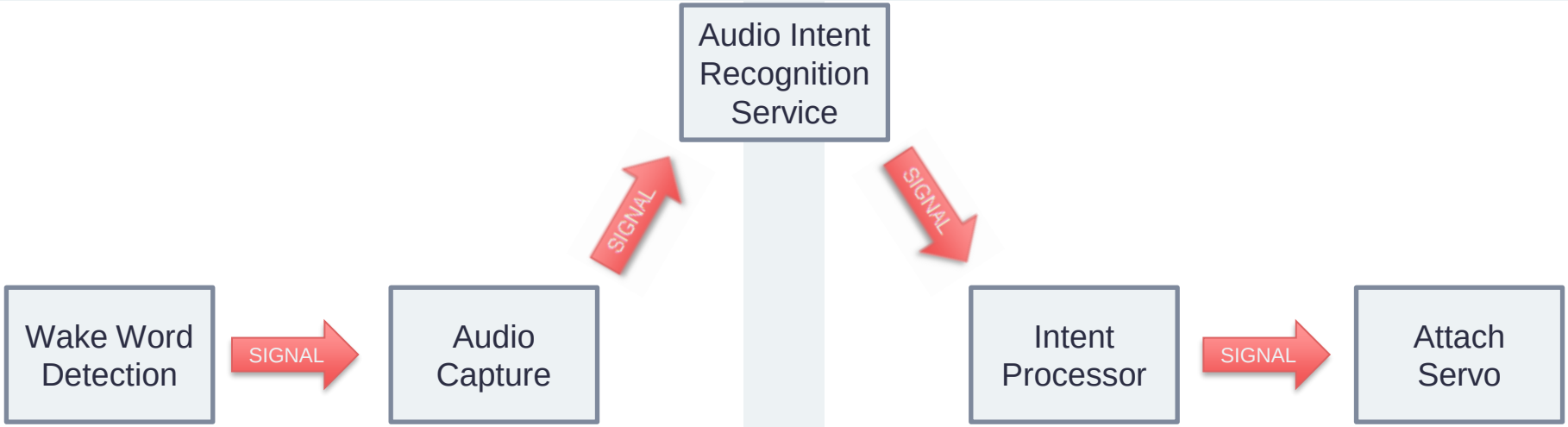
Hardware Components

Arduino Uno R3	
Node-MCU ESP32S	
Servo RC MG996G	
Microphone INMP441	

Software Components and Platform

Visual Studio Code	Visual Studio Code
Arduino IDE	ARDUINO
Jupyter Notebook	jupyter
Tensorflow Lite	TensorFlow Lite

How Does It Work?



How Does It Work?
-System Operation-

Wake Word Detection

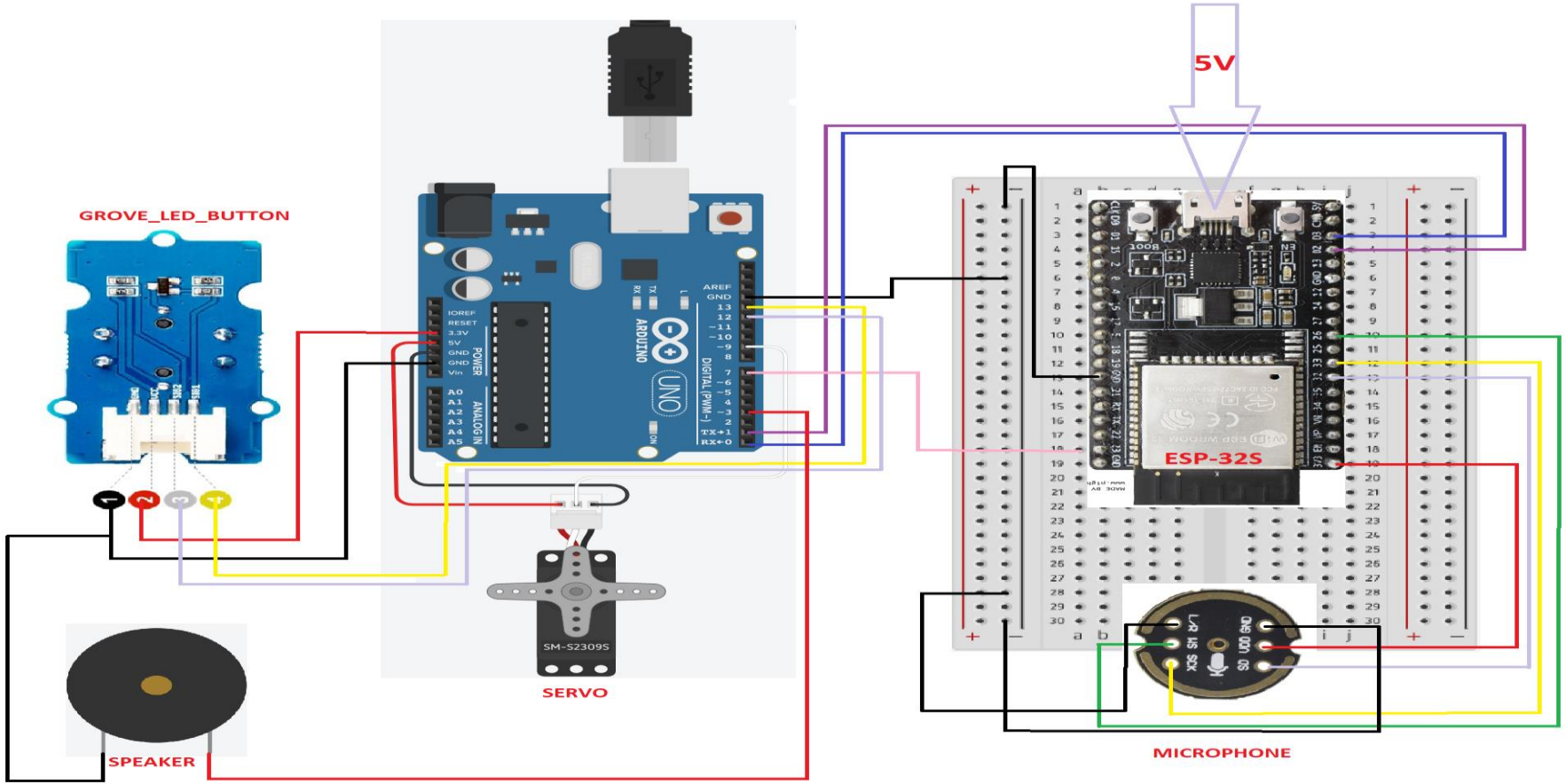
SIGNAL

Intent Processor

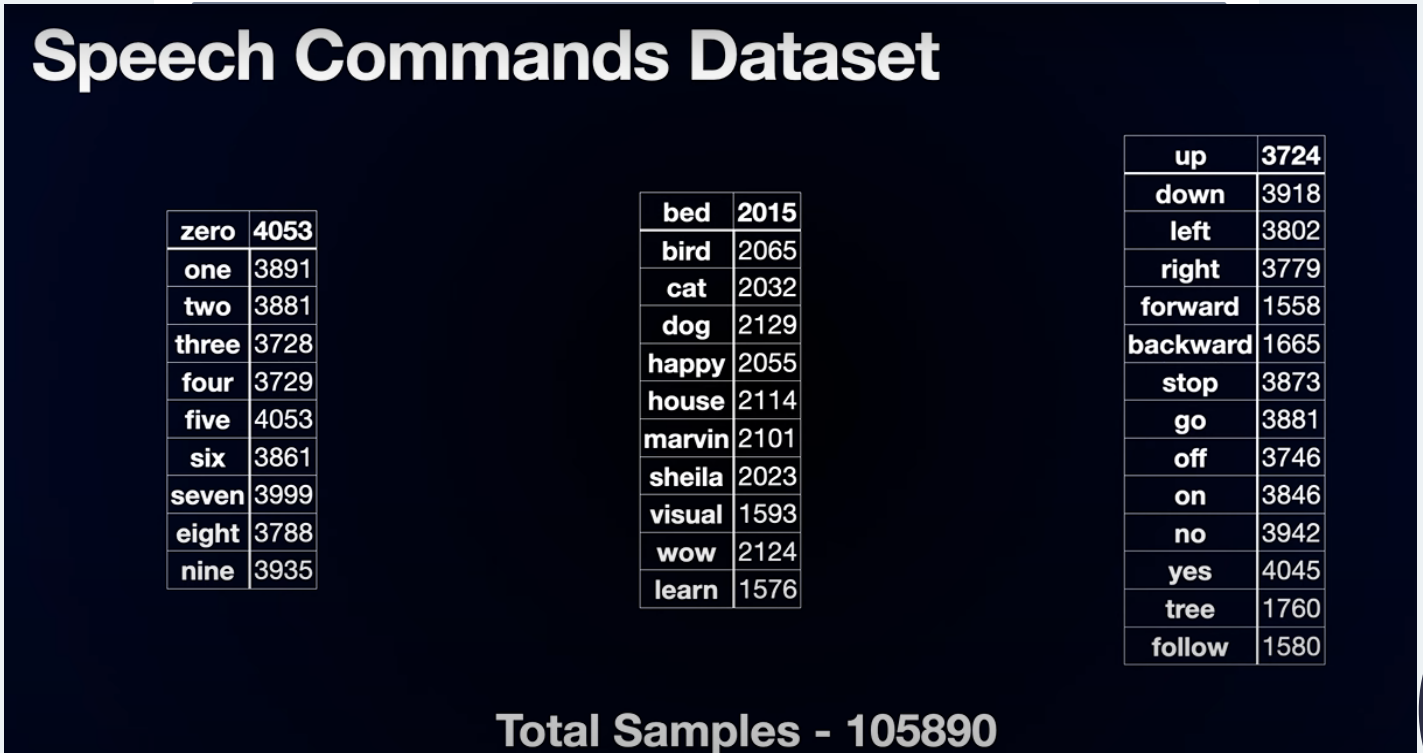
SIGNAL

Intent Excutor

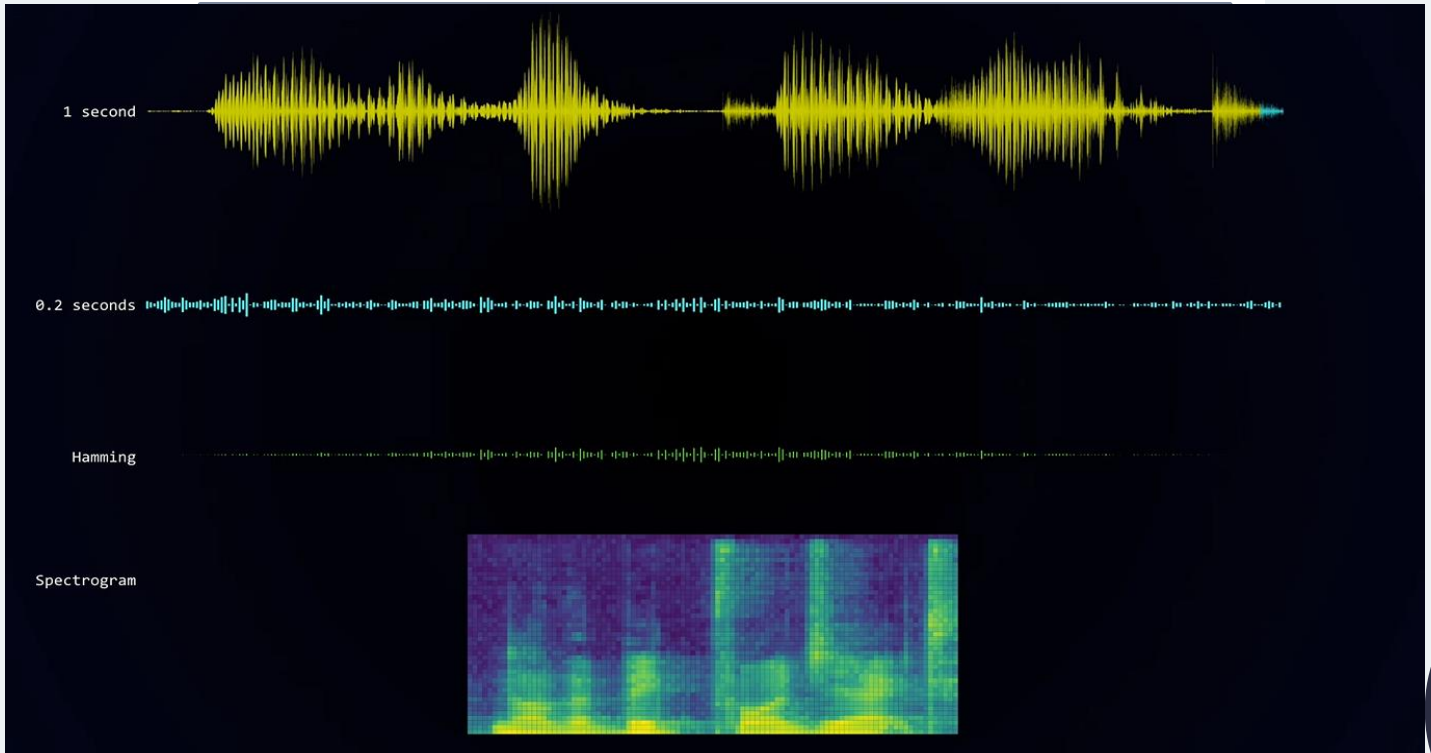
Circuit and Wiring



Learning Model
-Data Prepagation-



Learning Model
-Feature Extraction-



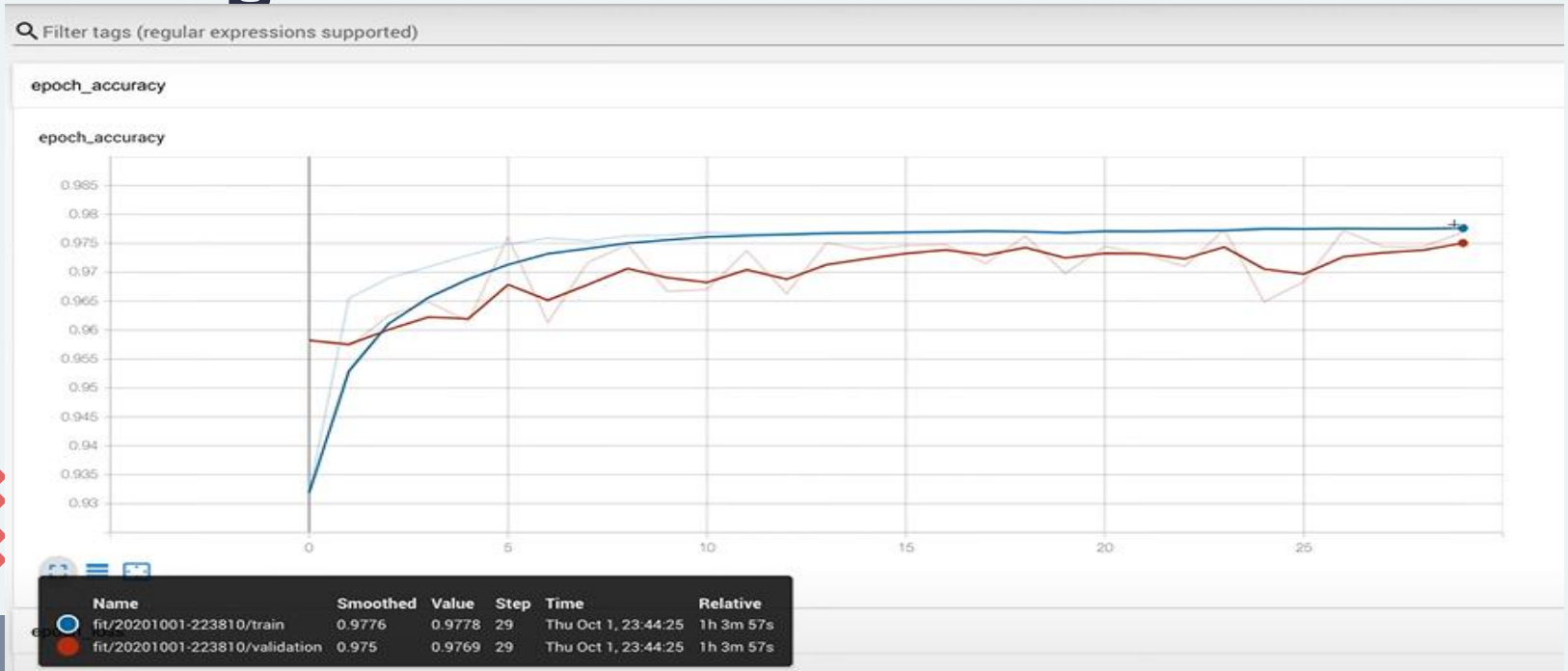
Learning Model
-Architecture & Hyper parameters-

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
conv_layer1 (Conv2D)         (None, 99, 43, 4)         40
_________________________________________________________________
max_pooling1 (MaxPooling2D)  (None, 49, 21, 4)         0
_________________________________________________________________
conv_layer2 (Conv2D)         (None, 49, 21, 4)         148
_________________________________________________________________
max_pooling2 (MaxPooling2D)  (None, 24, 10, 4)         0
_________________________________________________________________
flatten (Flatten)            (None, 960)               0
_________________________________________________________________
dropout (Dropout)            (None, 960)               0
_________________________________________________________________
hidden_layer1 (Dense)        (None, 40)                38440
_________________________________________________________________
output (Dense)               (None, 1)                 41
=================================================================
Total params: 38,669
Trainable params: 38,669
Non-trainable params: 0
_________________________________________________________________
```

Learning Model
-Learning Hyper-Parameters-

- Batch size: 30.
- Learning algorithm: Adam.
- Loss function: Binary cross entropy.

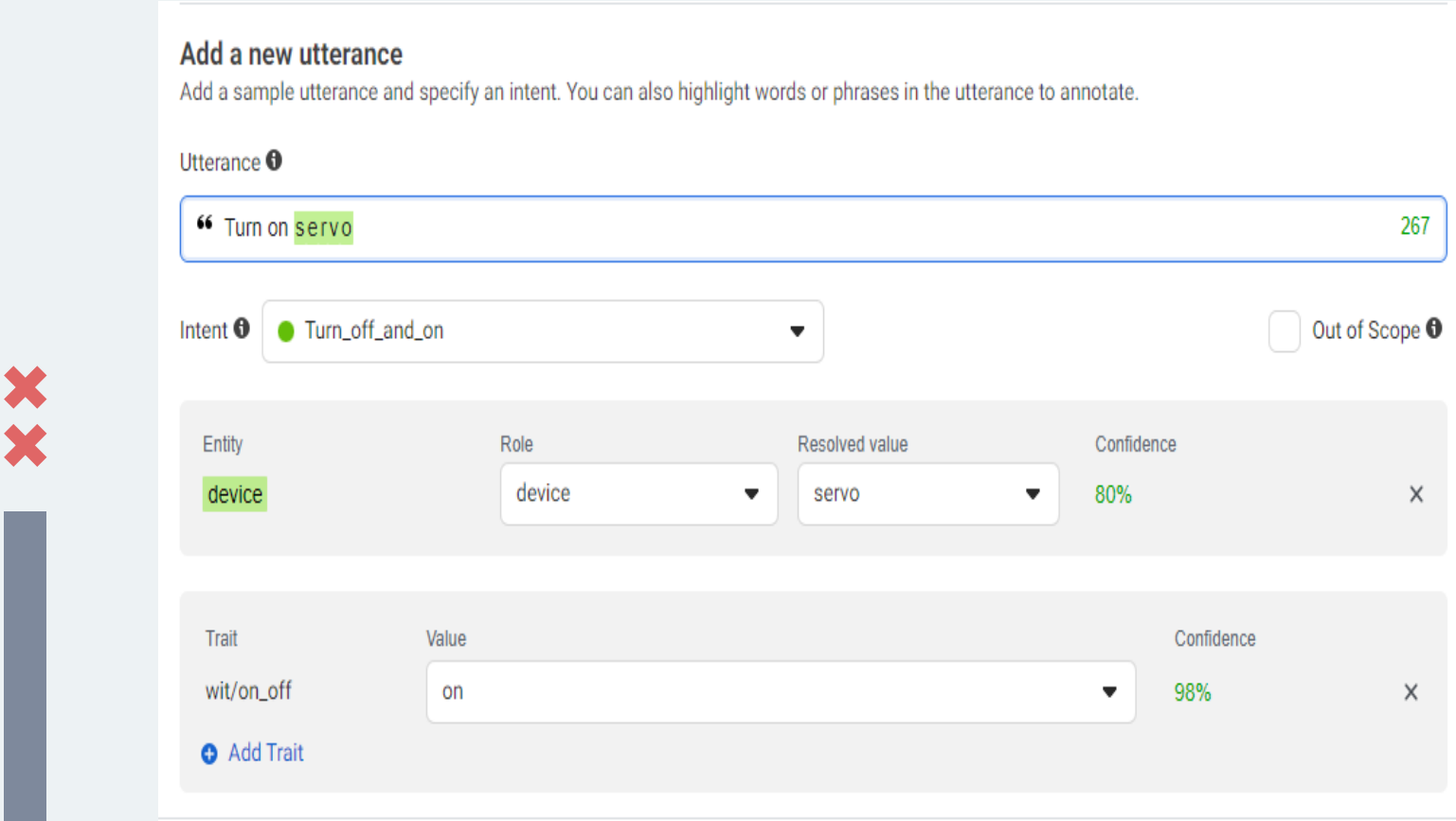
Learning Model -Validation-



Confusion Matrix

```
<tf.Tensor: shape=(2, 2), dtype=int32, numpy=
array([[13616,   427],
       [  743, 11927]], dtype=int32)>
```

Wit.ai –Service-



Wit.ai -Request and Responde-

wit.ai

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```
const {Wit} = require('node-wit');

const client = new Wit({accessToken: 'TOKEN'});

client.message('Turn on the lights').then(({entities, inte

  console.log(intents);

  console.log(entities);

  console.log(traits);

});
```


```
{
 "text": "Turn on the lights"
 "intents": [
            {
             "id": "508388063374132"
             "name": "lights"
             "confidence": 0.9951
            }
           ]
 "entities": {
            }
 "traits": {
          "wit$on_off": [
                       {
                        "id": "535a80f0-6922-4680-b678-0576f248cdcc"
                        "value": "on"
                        "confidence": 0.9852
                       }
                      ]
          }
}
```

Demo

Resources

References

- atomic14, “Github” - DIY Alexa https://github.com/atomic14/diy-alexa.
- A.Ulitin, “huckster.io” – DIY Arduino Cat Feeder https://www.hackster.io/momwillbeproud/diy-arduino-cat-feeder-1c4c7f.

Thanks

Do you have any questions?
lahyus7399@gmail.com

+84 836 476 472