Predictive Analytics and Machine Learning Basics
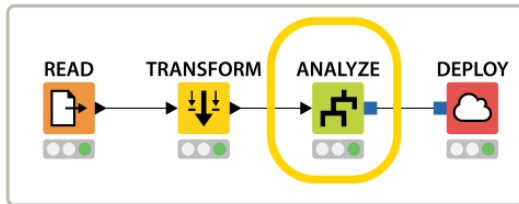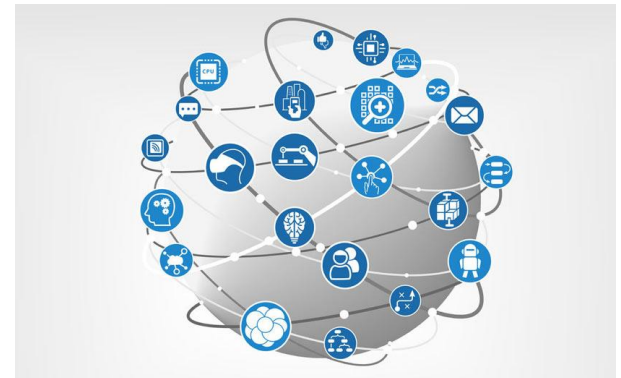
Class 4: Machine Learning Lab – Google AIY Voice Kit

July 19, 2018
Don Wilcher

Presented by:

Class 4: Machine Learning Lab – Google Voice Kit

Agenda

- What is Google Assistant?
- Lab Project: Build Google Voice Kit: An Intelligent Speaker.

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What is Google Assistant?

- **The Google Assistant** is a virtual assistant using Artificial Intelligence.

- A voice-activated virtual assistant.

- Developed by Google for mobile and smart home devices.

- Google Assistant can engage in two way conversation.

- Google Assistant uses natural language processing algorithm.

Source:

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What is Google Assistant?. . .

Natural Language Processing:

An area of computer science and artificial intelligence that works between human (natural) languages and computer interactions is called Natural Language Processing (NLP). The goal of NLP is computer programs are used to process and analyze large amounts of natural language data.

Google Assistant Icon:

Source:

https://en.wikipedia.org/wiki/Natural_language_processing

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Question 1:

What is Google Assistant?

Lab Project: Build a Google Voice Kit: An Intelligent Speaker

Lab Project Objectives:

a. Learn about Intelligent (Smart) Speakers.

b. Learn how to build an Intelligent Speaker.

   i. The Intelligent Speaker Build and Test Workflow

c. Learn how to execute the Google Assistant Demo.

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What is an Intelligent (Smart Speaker)?

a. An intelligent or smart speaker that is hands-free an voice activated.

b. It's a wireless connected speaker.

c. An integrated virtual assistant that uses artificial intelligence that provides interactive actions.

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What is an Intelligent (Smart Speaker)?

d. A smart device that uses WiFi, Bluetooth an other wireless protocol standards to extend usage beyond audio playback.

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True or False: The goal of NLP is computer programs are used to process and analyze small amounts of natural language data?

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What is an Intelligent (Smart) Speaker?

The first-generation Amazon Echo smart speaker in black

An Apple HomePod speaker
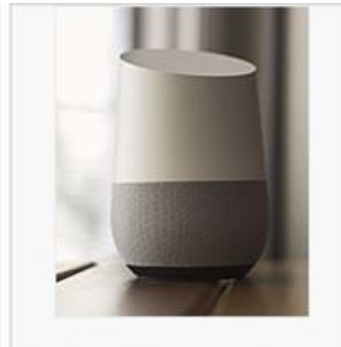
The Google Home smart speaker idle on a table

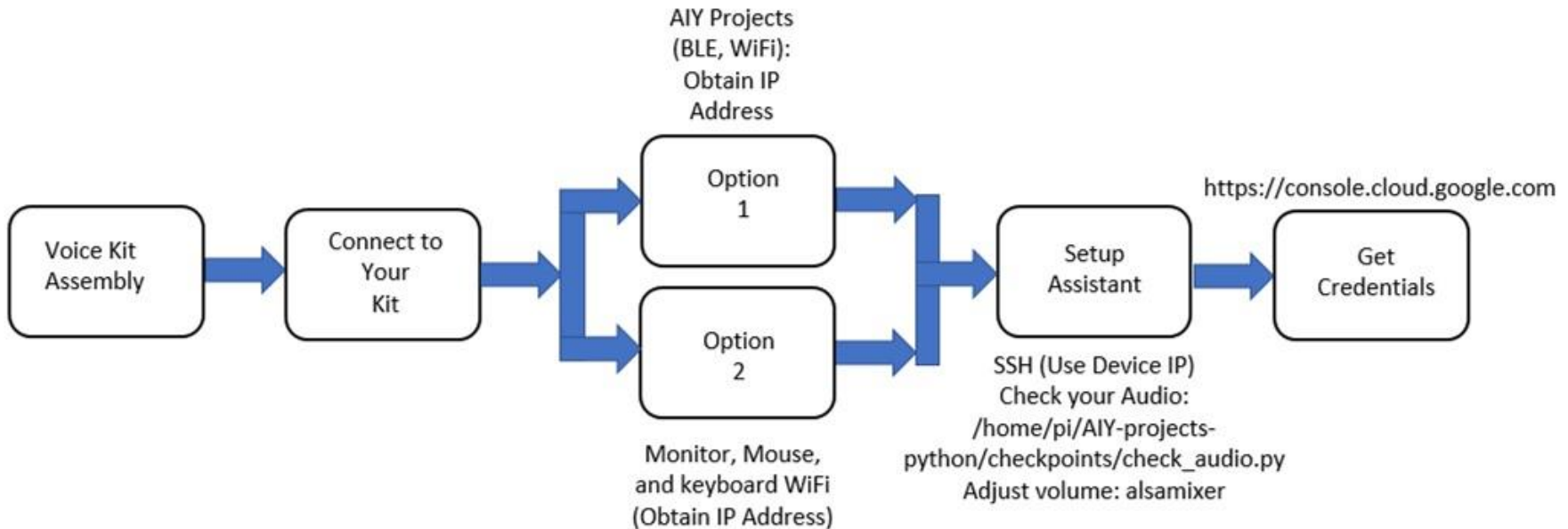The Amazon Echo Show smart speaker in white

The Harman Kardon INVOKE smart speaker in graphite

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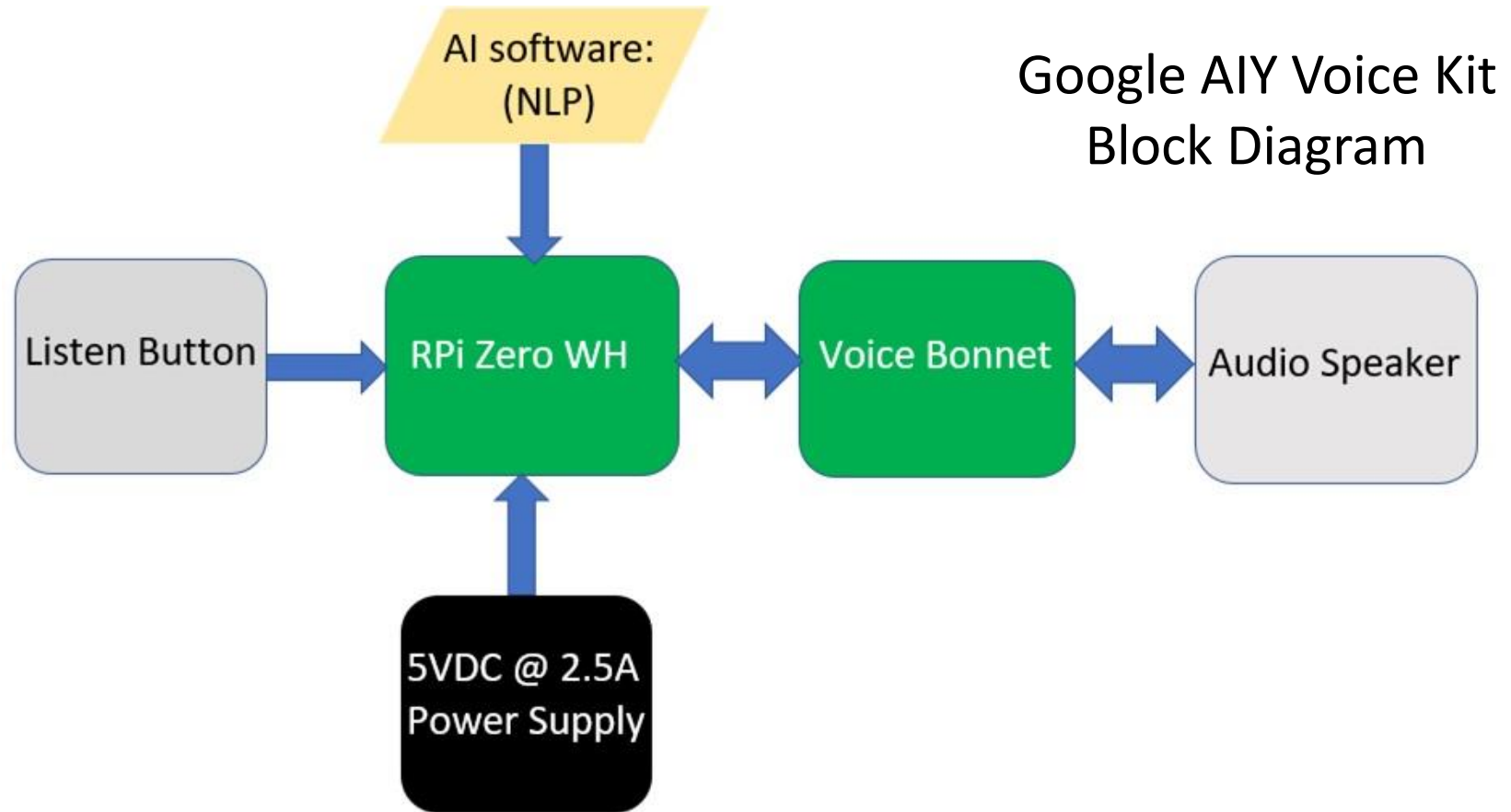
Intelligent (Smart) Speaker Build Workflow

Google AIY Voice Kit

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Intelligent Speaker Build Workflow

Google AIY Voice Kit Block Diagram

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Intelligent Speaker Build Workflow

Assembly information pages will be referenced from the Makers guide document.

Source:
https://aiyprojects.withgoogle.com/voice/#makers-guide-build-on-android-things

Question 3 :

On slide 11 where does one go on the web to obtain credentials for using the Google Assistant API?

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Intelligent Speaker Build Workflow

List of materials

Google AIY Voice Kit

Source:
https://aiyprojects.withgoogle.com/voice/#makers-guide-build-on-android-things

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Intelligent Speaker Build Workflow

Google AIY Voice Kit

IN YOUR KIT

1	Voice Bonnet	(×1)
2	Raspberry Pi Zero WH	(×1)
3	Speaker	(×1)
4	Micro SD Card	(×1)
5	Push Button	(×1)
6	Button Nut	(×1)
7	Button Harness	(×1)
8	Standoffs	(×1)
9	Micro USB Cable	(×1)
10	External Box	(×1)

Source:

https://aiyprojects.withgoogle.com/voice/#makers-guide-build-on-android-things

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Question 4 :

On slide 12 what component is used to listen to words on the Google AIY Voice Kit?

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Intelligent Speaker Build Workflow

Voice Kit Assembly

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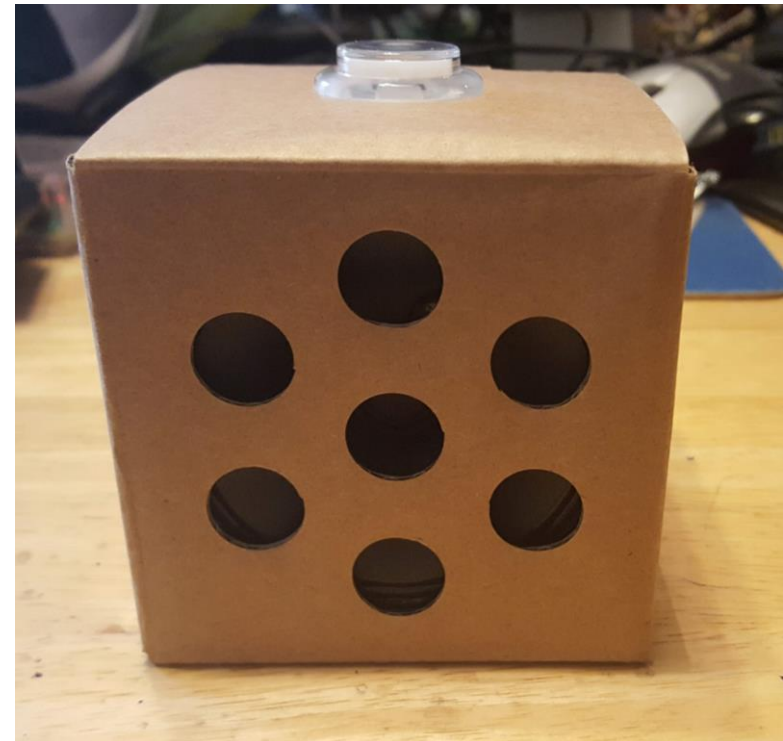
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Lab Project: Build a Google Voice Kit: An Intelligent Speaker. . .

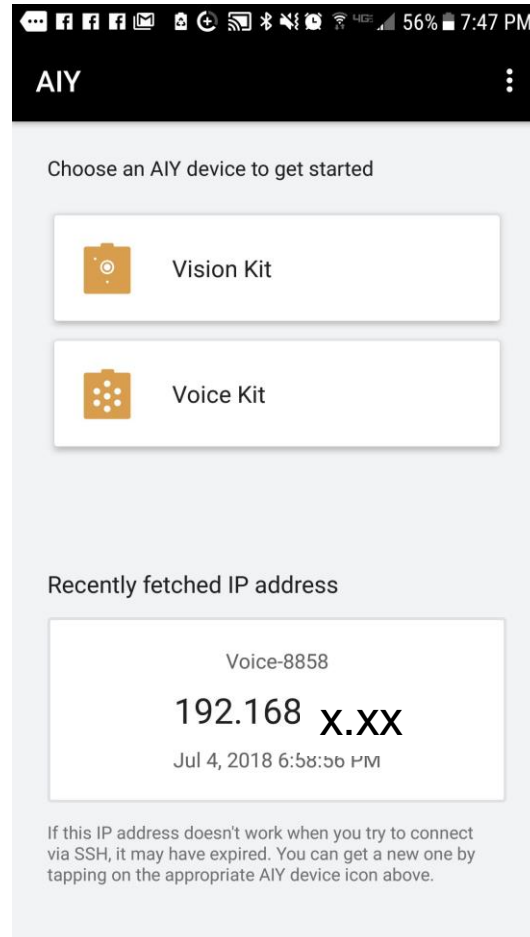## Intelligent Speaker Build Workflow

Voice Kit Assembly

Presented by:
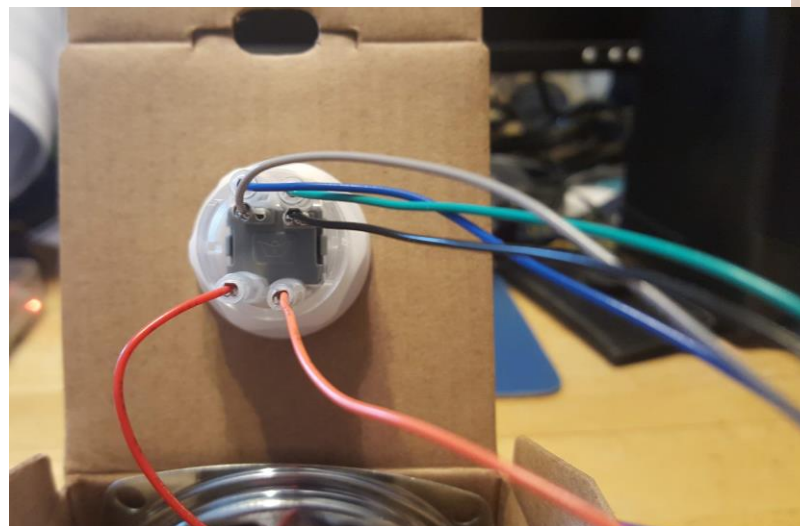
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Intelligent Speaker Build Workflow

Connect to Your Kit: Option 1

(pp. 24-25/74)

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Intelligent Speaker Build Workflow

Setup Assistant


```
Linux raspberrypi 4.9.59+ #1047 Sun Oct 29 11:47:10 GMT 2017 armv6l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Build info: Thu Feb 22 01:10:07 UTC 2018 @ 3368a38
Last login: Fri Jul  6 23:11:44 2018

SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
 a new password.
```

SSH into the Google AIY Voice Kit
via Putty(pp 29-32/74)

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Intelligent Speaker Build Workflow

Setup Assistant


```
pi@raspberrypi: ~/AIY-voice-kit-python                          —    □    ×

pi@raspberrypi:~/AIY-projects-python/checkpoints $ cd
pi@raspberrypi:~ $ /home/pi/AIY-projects-python/checkpoints/check_audio.py
Playing a test sound...
Did you hear the test sound? (y/n) y
When you're ready, press enter and say 'Testing, 1 2 3'...
Recording...
Playing back recorded audio...
Did you hear your own voice? (y/n) y
The audio seems to be working.
Press Enter to close...
```

Testing Audio function of Google
AIY Voice Kit (p.33-34/74)

Source:

https://aiyprojects.withgoogle.com/voice/#makers-guide-build-on-android-things

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Setup Assistant

https://console.cloud.google.com

```
Get
Credentials
```

(pp. 35-46/74)

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Get Credentials (pp. 35-46/74)

a. Login using Google Account

b. Agree to the Terms of Service

c. Navigate to the Library

d. Turn on the Google Assistant API

e. Enable the Google Assistant API

f. Create Credentials

g. Download the Credentials (client_id.json file)

h. Add to assistant.json (use nano text editor)

i. Confirm assistant .json file was created

j. Move to the demos folder (cd AIY-voice-kit-python)

k. Run assistant demo (src/examples/voice/assistant_grpc_demo.py

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Intelligent Speaker Build Workflow

Assistant Demo running

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Intelligent Speaker Build Workflow

Assistant Demo running:

The AIY app sends notifications via bluetooth from the Google Voice Kit to your Android Smart phone!

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On slide 23 what file must be downloaded to acquire credentials to use the Google Assistant API with the Google AIY Voice Kit?

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