

BUILDING CONVERSATIONAL AGENTS WITH DIALOGFLOW

DevFest SW 17 | David Asamu

What is Dialogflow?

Google's platform for building conversational apps or agents

- Google Assistant
- Google Home
- External platforms through - APIs or Integration
- Chatbots, home automation, cars, smart watch, etc
- Over 32 platform sdks and integration

We've changed our name! API.AI is now Dialogflow. [Learn more here.](#)

Build natural and rich conversational experiences

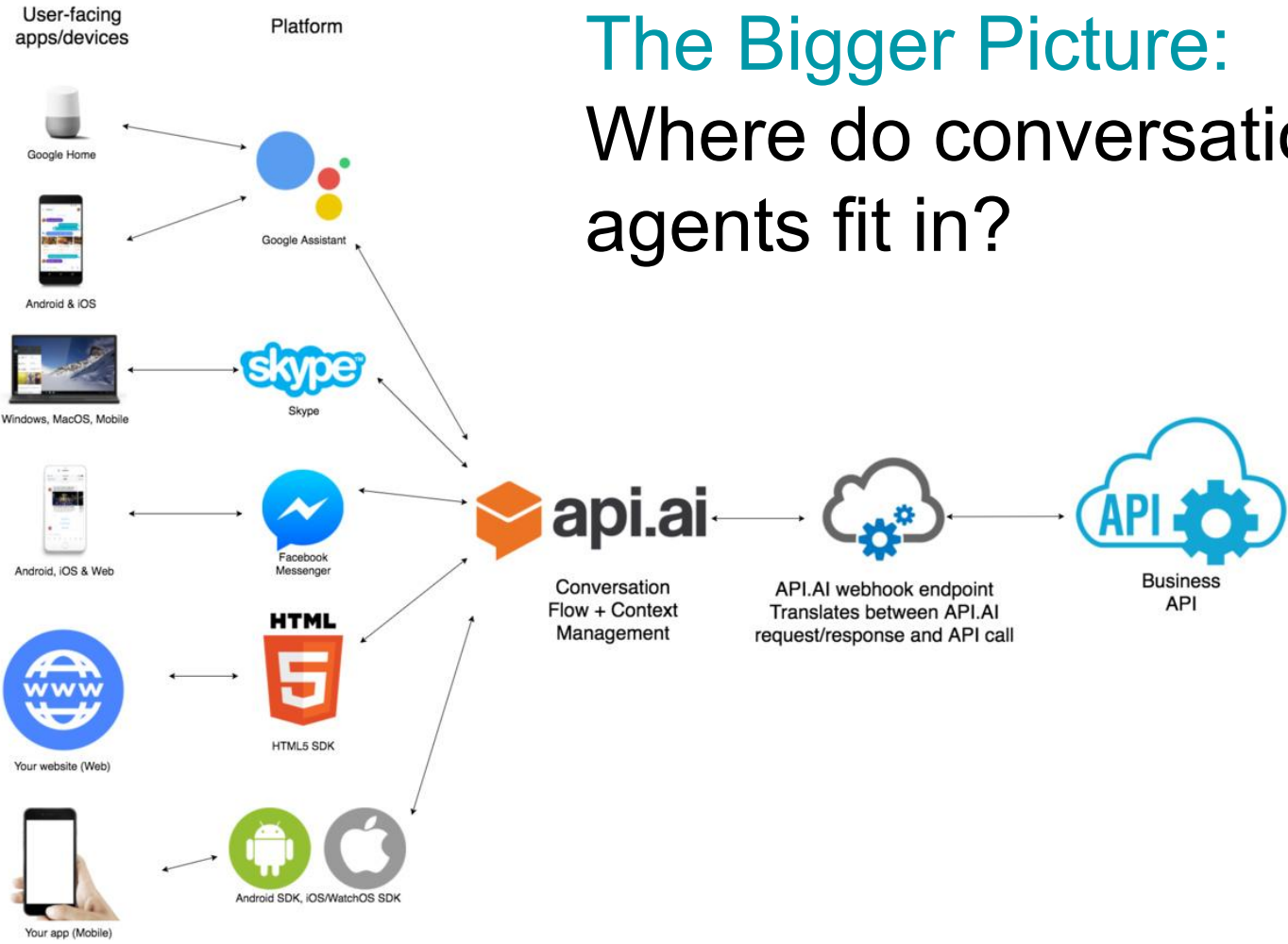
Give users new ways to interact with your product by building engaging voice and text-based conversational interfaces powered by AI. Connect with users on the Google Assistant, Amazon Alexa, Facebook Messenger, and other popular platforms and devices.

[SIGN UP FOR FREE](#)



What is a Conversational Agent?

The Bigger Picture: Where do conversational agents fit in?



Do I need a PhD in
machine learning
and/or natural
language
processing to get
started?



Core Concepts of DialogFlow

1. Intents

Use intents to identify the intention of the user

An intent represents a mapping between what a user says and what action should be taken by your software.

A user asks the agent "What's the weather supposed to be like in San Francisco tomorrow?"

● Motion

SAVE

Try it now

Contexts

User says

Search in user says

” Add user expression

” keep going

” run

” turn left

” go two steps forward

” move backwards

” go away

” can you move a step back?

Events ⓘ

Action

ⓘ Please use test console above to try a sentence.

User says

Search in user says



” Add user expression

” book me a hotel

” reserve a hotel room in Tokyo

” book a room in Paris for 2

” book a hotel in Rome for March 7

” reserve me Holiday Inn in London

” book hotel in San Francisco check in is 10th of June

” reserve a hotel room from March 10 to March 13

” reserve Hilton from 10/03 till 10/07

” I'd like to book a room at Marriott in New York from February 12 till February 15

2. Entities

Use entities to grab additional information

- The agent needs to know what information is useful for answering the user's request.
- These pieces of data are called entities.
- Entities like name, time, date, and numbers are covered under system entities.
- You can add custom entities to cover data more specific to your domain

User says

Search in user says  

” Add user expression

” weather forecast in San Francisco tomorrow

PARAMETER NAME	ENTITY	RESOLVED VALUE	
geo-city	@sys.geo-city	San Francisco	×
date	@sys.date	tomorrow	×

” weather for tomorrow

” what is the weather today

” weather forecast

● Motion

SAVE

Try it now

Contexts

User says

Search in user says

” Add user expression

” go two steps forward

PARAMETER NAME

ENTITY

RESOLVED VALUE

number

@sys.number

two

” move backwards

” go away

” can you move a step back?

Events ?

Action

Enter action name

ⓘ Please use test console above to try a sentence.

Robotron

en

Intents

Entities

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Support

Account

Logout

” go **two** steps forward

” move backwards

” go away

” can you move a step **back**?

PARAMETER NAME

Filter

number

@sys.number: **number**

@sys.date-period

@sys.email

@sys.unit-weight-name

@sys.unit-length-name

@sys.geo-county-gb

Events [?]

Add event

Action

Enter action name

REQUIRED [?]

PARAMETER NAME

IS LIST [?]

number

[+ Create new](#)

ⁱ Please use test console above to try a sentence.

Robotron

en

Intents

Entities

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Support

Account

Logout

” go two steps forward

PARAMETER NAME

number

” move backwards

” go away

” can you move a step b

Filter

@sys.number:

@sys.date-period

@sys.email

@sys.unit-weight-name

@sys.unit-length-name

@sys.geo-county-gb

Events [?]

Add event

Action

Enter action name

[+ Create new](#)

REQUIRED [?]


PARAMETER NAME [?]


ENTITY [?]


VALUE

IS LIST [?]

ⁱ Please use test console above to try a sentence.

Robotron ⌵ 

 en +
 Intents +
 Entities +
 Training ^[beta]
 Integrations

 Analytics ^[new]
 Fulfillment

 Support

 Account

 Logout

● Motion

 SAVE ⋮

Try it now

” Add user expression

” run

” turn left

” go two steps forward

PARAMETER NAME	ENTITY	RESOLVED VALUE	
number	@sys.number	two	×
direction	@direction	forward	×


” move backwards

” go away

” can you move a step back?

 Events ? ⌵

 Action ⌶

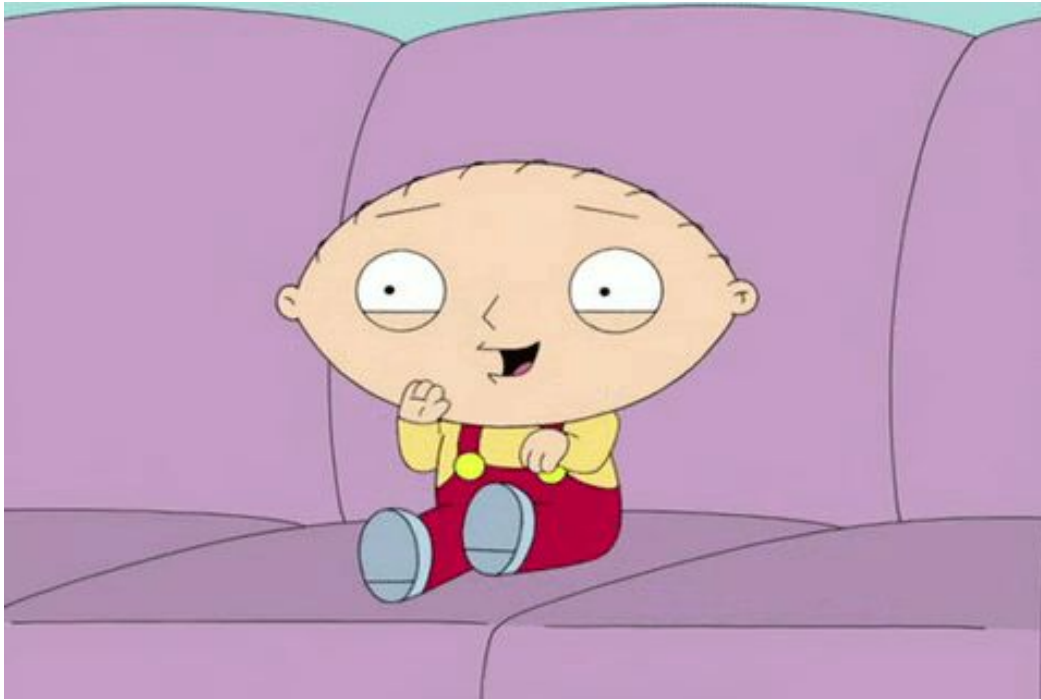
 Please use test console above to try a sentence.

Intents

Entities



Let's try out Robotron



Wait for it

Try it now

Agent

USER SAYS

[COPY CURL](#)

Hello!

 DEFAULT RESPONSE ▾

[PLAY](#)

Sorry, can you say that again?

INTENT

[Default Fallback Intent](#)

ACTION

input.unknown

[SHOW JSON](#)



So What went wrong?

Robotron 

en 

Intents 

Entities 

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Support

Account

Logout



 Default Fallback Intent

 Default Welcome Intent

 Motion

Agent

USER SAYS

[COPY CURL](#)

Hello!

 DEFAULT RESPONSE 

[PLAY](#)

Sorry, can you say that again?

INTENT

[Default Fallback Intent](#)

ACTION

input.unknown

[SHOW JSON](#)

3. Small Talk To The Rescue!

Robotron
en
Intents
Entities
Training ^[beta]
Integrations
Analytics ^[new]
Fulfillment
Prebuilt Agents
Small Talk
Support
Account
Logout

Your agent can learn how to support small talk without any extra development. By default, it will respond with predefined phrases. Use the form below to customize responses to the most popular requests.

User: How are you?
Agent: Wonderful as always. Thanks for asking.

User: You're so sweet.
Agent: Thanks! The feeling is mutual.

 Enable

Small Talk Customization Progress 0%

About agent 0%








Courtesy 0%

Emotions 0%

Hello/Goodbye 0%

About user 0%

i Please use test console above to try a sentence.

Robotron  en  Intents  Entities  Training ^[beta] Integrations Analytics ^[new] Fulfillment Prebuilt Agents Small Talk Support Account Logout EnableSmall Talk Customization Progress  0% About agent  0%

QUESTION Who are you?

ANSWER

QUESTION How old are you?

ANSWER

QUESTION You're annoying.

ANSWER

QUESTION Answer my question.

ANSWER  Please use test console above to try a sentence.

Robotron

en

Intents

Entities

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Prebuilt Agents

Small Talk

Support

Account

Logout

Agent: thanks! The feeling is mutual.

 Enable

Small Talk Customization Progress

 0%

About agent

 3%

QUESTION Who are you?

ANSWER

- 1 My name is Robotron. I am here to protect earthlings against evil alien invaders from Zobo galaxy
- 2 You can call me Robotron. I keep evil guys away from Earth.
- 3 Enter a Answer variant

QUESTION How old are you?

ANSWER

- 1 Enter a Answer





QUESTION You're annoying.

ANSWER

- 1 Enter a Answer

i Please use test console above to try a sentence.

Let's try again

 Training ^[beta] Integrations Analytics ^[new] Fulfillment Prebuilt Agents Small Talk[> Docs](#)[> Forum](#) Support Account Logout

Your agent can learn how to support small talk without any extra development. By default, it will respond with predefined phrases. Use the form below to customize responses to the most popular requests.

User: How are you?
Agent: Wonderful as always. Thanks for asking.

User: You're so sweet.
Agent: Thanks! The feeling is mutual.

 Enable

Small Talk Customization Progress

 About agent	<div style="width: 3%;"></div>	0%
 Courtesy	<div style="width: 0%;"></div>	0%
 Emotions	<div style="width: 0%;"></div>	0%
 Hello/Goodbye	<div style="width: 0%;"></div>	0%

Domains

USER SAYS [COPY CURL](#)

Hello!

RESPONSE [PLAY](#)

Hi there, friend!

INTENT

Not available

ACTION

smalltalk.greetings.hello

[SHOW JSON](#)

Your agent can learn how to support small talk without any extra development. By default, it will respond with predefined phrases. Use the form below to customize responses to the most popular requests.

User: How are you?
Agent: Wonderful as always. Thanks for asking.

User: You're so sweet.
Agent: Thanks! The feeling is mutual.

 Enable

Small Talk Customization Progress

 About agent  0%

 Courtesy  0%

 Emotions  0%

 Hello/Goodbye  0%

[Try it now](#)

Domains

USER SAYS [COPY CURL](#)

how are you?

RESPONSE [PLAY](#)

Couldn't be better.



INTENT

Not available

ACTION

smalltalk.greetings.how_are_you

[SHOW JSON](#)

 Training ^[beta] Integrations Analytics ^[new] Fulfillment Prebuilt Agents Small Talk[> Docs](#)[> Forum](#) Support Account Logout





Your agent can learn how to support small talk without any extra development. By default, it will respond with predefined phrases. Use the form below to customize responses to the most popular requests.

User: How are you?
Agent: Wonderful as always. Thanks for asking.

User: You're so sweet.
Agent: Thanks! The feeling is mutual.

 Enable

Small Talk Customization Progress

 About agent	<div style="width: 3%;"></div>	0%
 Courtesy	<div style="width: 0%;"></div>	0%
 Emotions	<div style="width: 0%;"></div>	0%
 Hello/Goodbye	<div style="width: 0%;"></div>	0%

Domains

USER SAYS

[COPY CURL](#)

who are you?

RESPONSE

[PLAY](#)

My name is Robotron. I am here to protect earthlings against evil alien invaders from Zobo galaxy

INTENT

Not available

ACTION

smalltalk.agent.acquaintance

[SHOW JSON](#)

Small Talk

[SAVE](#)

respond with predefined phrases. Use the form below to customize responses to the most popular requests.

User: How are you?
Agent: Wonderful as always. Thanks for asking.

User: You're so sweet.
Agent: Thanks! The feeling is mutual.

 Enable

Small Talk Customization Progress

About agent

0%

Courtesy

0%

Emotions

0%

Hello/Goodbye

0%

[Try it now](#)

USER SAYS

[COPY CURL](#)

Nice to meet you Robotron. Can you move one step forward?

DEFAULT RESPONSE

Not available

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

forward

number

[1]

[SHOW JSON](#)

JSON

```
1 {
2   "id": "c5f13b86-d3a8-4f38-9351-549e0ea7f55e",
3   "timestamp": "2017-11-14T13:18:01.512Z",
4   "lang": "en",
5   "result": {
6     "source": "agent",
7     "resolvedQuery": "Nice to meet you Robotron. Can you move one step forward?",
8     "action": "robot.move",
9     "actionIncomplete": false,
10    "parameters": {
11      "direction": "forward",
12      "number": [
13        1
14      ]
15    },
16    "contexts": [],
17    "metadata": {
18      "intentId": "6184a929-8452-4949-b818-4568eb63375c",
19      "webhookUsed": "false",
20      "webhookForSlotFillingUsed": "false",
21      "intentName": "Motion"
22    },
23    "fulfillment": {
24      "speech": "",
25      "messages": [
26        {
27          "type": 0,
28          "speech": ""
29        }
30      ]
31    }
32  }
33 }
```

CLOSE

COPY

COPY CURL

et you Robotron. Can you move one
rd?

RESPONSE

le

VALUE

forward

[1]

SHOW JSON

Robotron

en

Intents

Entities

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Support

Account

Logout

Motion

SAVE

robot.move

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST
<input type="checkbox"/>	number	@sys.number	\$number	<input checked="" type="checkbox"/>
<input type="checkbox"/>	direction	@direction	\$direction	<input type="checkbox"/>
<input type="checkbox"/>	Enter name	Enter entity	Enter value	<input type="checkbox"/>

+ New parameter

Response

DEFAULT +

Text response

1 Enter a text response

ADD MESSAGE CONTENT

Try it now

USER SAYS

COPY CURL

Nice to meet you Robotron. Can you move one step forward?

DEFAULT RESPONSE

Not available

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

forward

number

[1]

SHOW JSON

Adding a Reply

Motion

SAVE

robot.move

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST
<input type="checkbox"/>	number	@sys.number	\$number	<input checked="" type="checkbox"/>
<input type="checkbox"/>	direction	@direction	\$direction	<input type="checkbox"/>
<input type="checkbox"/>	Enter name	Enter entity	Enter value	<input type="checkbox"/>

+ New parameter

Response ⓘ

DEFAULT +

Text response

- Moving \$direction
- Moving \$number steps \$direction
- Enter a text response variant

ADD MESSAGE CONTENT

Try it now

USER SAYS

COPY CURL

Nice to meet you Robotron. Can you move one step forward?

DEFAULT RESPONSE

Not available

INTENT

Motion

ACTION

robot.move

PARAMETER	VALUE
direction	forward
number	[1]

SHOW JSON

Robotron

en

Intents

Entities

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Support

Account

Logout

Motion

SAVE

robot.move

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST
<input type="checkbox"/>	number	@sys.number	\$number	<input checked="" type="checkbox"/>
<input type="checkbox"/>	direction	@direction	\$direction	<input type="checkbox"/>
<input type="checkbox"/>	Enter name	Enter entity	Enter value	<input type="checkbox"/>

+ New parameter

Response

DEFAULT +

Text response

- Moving \$direction
- Enter a text response variant

ADD MESSAGE CONTENT

Try it now

Agent

Domains

USER SAYS

COPY CURL

Nice to meet you Robotron. Can you move one step forward?

DEFAULT RESPONSE

PLAY

Moving forward

INTENT

Motion

ACTION

robot.move

PARAMETER	VALUE
direction	forward
number	[1]

Robotron



en



Intents



Entities


 Training [beta]

Integrations

 Analytics [new]

Fulfillment

Support

Account

Logout

Motion

SAVE



Contexts



User says

Search in user says



” Add user expression

” can you move a step back?

” move backwards

” go two steps forward

 Events ?


Action



robot.move

REQUIRED <small>?</small>	PARAMETER NAME <small>?</small>	ENTITY <small>?</small>	VALUE	IS LIST <small>?</small>
<input type="checkbox"/>	number	@sys.number	Snumber	<input checked="" type="checkbox"/>

number

@sys.number

Snumber



Try it now

Agent

Domains

USER SAYS

COPY CURL

Hey Robotron, take ten steps backwards

DEFAULT RESPONSE

PLAY

Moving 10 steps backward

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

backward

number

[10]

SHOW JSON

4. Slot filling

Use slot filling to get missing information

- The user doesn't have to include all the required information in a single statement
- If any of the required information is missing, slot filling allows you to ask the user specifically for the missing piece of information

Robotron ⌵ 


en +

 Intents +


 Entities +

 Training ^[beta]

 Integrations

 Analytics ^[new]

 Fulfillment

 Support

 Account

 Logout

 Logout

● Motion

SAVE ⋮

Contexts ⌵

User says Search in user says  ⌵

” Add user expression

” can you move a step back?

” move backwards

” go two steps forward

Events  ⌵

Add event

Action ⌵

robot.move

REQUIRED  PARAMETER NAME  ENTITY  VALUE IS LIST 

Try it now

Agent

Domains

USER SAYS

[COPY CURL](#)

move

 DEFAULT RESPONSE ⌵

Not available

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

number

[]

SHOW JSON

Robotron

en

Intents

Entities

Training [beta]

Integrations

Analytics [new]

Fulfillment

Support

Account

Logout

Add event

Action

robot.move

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST	PROMPTS
<input type="checkbox"/>	number	@sys.number	\$number	<input type="checkbox"/>	-
<input checked="" type="checkbox"/>	direction	@direction	\$direction	<input type="checkbox"/>	Define prompts...
<input type="checkbox"/>	Enter nam	Enter entit	Enter value	<input type="checkbox"/>	

[+ New parameter](#)

Response

DEFAULT

Text response

Agent

Domains

USER SAYS

[COPY CURL](#)

move

DEFAULT RESPONSE

Not available

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

number

[]

[SHOW JSON](#)

Robotron

en

Intents

Entities

Training ^[beta]

Integrations

Analytics ^[new]

Fulfillment

Support

Account

Logout

Prompts for "direction"

NAME	ENTITY	VALUE
direction	@direction	\$direction

PROMPTS

- In what direction?
- What direction should i go?
- where should i go?
- Enter a prompt variant

Close

Agent

Domains

USER SAYS

COPY CURL

move

DEFAULT RESPONSE

Not available

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

number

SHOW JSON

Robotron

en

Intents

Entities

Training [beta]

Integrations

Analytics [new]

Fulfillment

Support

Account

Logout

Contexts

User says

Search in user says

” Add user expression

” can you move a step back?

” move backwards

” go two steps forward

Events

Add event

Action

robot.move

REQUIRED

PARAMETER
NAME

ENTITY

VALUE

IS LIST

PROMPTS

Try it now

Agent

Domains

USER SAYS

[COPY CURL](#)

move

DEFAULT RESPONSE

[PLAY](#)

In what direction?

CONTEXTS

[RESET CONTEXTS](#)

motion_dialog_context

motion_dialog_params_direction

6184a929-8452-4949-b818-4568eb63375c_
id_dialog_context

INTENT

Motion

Agent training completed

[OK](#)

robot.move

JSON

```
40     "numberOriginal": "",
41     "direction": ""
42   },
43   "lifespan": 2
44 },
45 ],
46 "metadata": {
47   "intentId": "6184a929-8452-4949-b818-4568eb63375c",
48   "webhookUsed": "false",
49   "webhookForSlotFillingUsed": "false",
50   "intentName": "Motion"
51 },
52 "fulfillment": {
53   "speech": "In what direction?",
54   "messages": [
55     {
56       "type": 0,
57       "speech": "In what direction?"
58     }
59   ]
60 },
61 "score": 0.5299999713897705
62 },
63 "status": {
64   "code": 200,
65   "errorType": "success"
66 },
67 "sessionId": "c9ac4799-920b-416b-8489-2fe49c08cc05"
68 }
```

CLOSE

COPY

SHOW JSON

Robotron

en

Intents

Entities

Training [beta]

Integrations

Analytics [new]

Fulfillment

Support

Account

Logout

● Motion

SAVE

Contexts

User says

Search in user says

” Add user expression

” can you move a step back?

” move backwards

” go two steps forward

Events

Add event

Action

robot.move

REQUIRED

PARAMETER
NAME

ENTITY

VALUE

IS LIST

PROMPTS

Try it now

Agent

Domains

USER SAYS

left

COPY CURL

DEFAULT RESPONSE

Moving left

PLAY

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE

direction

left

number

SHOW JSON

JSON

```
3   "timestamp": "2017-11-14T13:49:53.844Z",
4   "lang": "en",
5   "result": {
6     "source": "agent",
7     "resolvedQuery": "left",
8     "action": "robot.move",
9     "actionIncomplete": false,
10    "parameters": {
11      "direction": "left",
12      "number": ""
13    },
14    "contexts": [],
15    "metadata": {
16      "intentId": "6184a929-8452-4949-b818-4568eb63375c",
17      "webhookUsed": "false",
18      "webhookForSlotFillingUsed": "false",
19      "intentName": "Motion"
20    },
21    "fulfillment": {
22      "speech": "Moving left",
23      "messages": [
24        {
25          "type": 0,
26          "speech": "Moving left"
27        }
28      ]
29    },
30    "score": 1
31  },
```

CLOSE

COPY

REQUIRED

NAME

ENTITY

VALUE

IS LIST



PROMPTS


SHOW JSON

5. Integration

Connect your agent with the end users

- Via One Click Integration
- Via APIs and SDKs

Robotron  

en 

 Intents 

 Entities 

 Training ^[beta]

 **Integrations**

 Analytics ^[new]

 Fulfillment

















 - - - - -


 Support










 Account

 Logout


One-click integrations

 Google Assistant <input type="checkbox"/>	 Web Demo <input type="checkbox"/>	 Facebook Messenger <input type="checkbox"/>	 Slack <input type="checkbox"/>
 Viber <input type="checkbox"/>	 Twitter <input type="checkbox"/>	 Twilio IP <input type="checkbox"/>	 Twilio (Text messaging) <input type="checkbox"/>
 Skype <input type="checkbox"/>	 Tropo (Text messaging) <input type="checkbox"/>	 Telegram <input type="checkbox"/>	 Kik <input type="checkbox"/>
			

 Please use test console above to try a sentence.

Robotron  en  Intents  Entities  Training ^[beta] Integrations Analytics ^[new] Fulfillment Support Support Account Logout

Dialogflow SDK's

Android
[More info](#)iOS / Watch OS / Mac
OS X
[More info](#)Ruby
[More info](#)Webkit HTML5
[More info](#)JavaScript
[More info](#)Node.js
[More info](#)Cordova
[More info](#)Unity
[More info](#).NET (WP8, W10)
[More info](#)c++
[More info](#)Xamarin
[More info](#)Python
[More info](#) Please use test console above to try a sentence.

6. Fulfillment

Set up a webhook to receive structured, actionable data from DialogFlow

- Unfortunately DialogFlow won't deliver the pizza, or make the robot dance
- Your web service will receive a POST request from Dialogflow for user queries matched by intents when you enable webhook.
- You determine what to do next with the data

Webhook

DISABLED

Your web service will receive a POST request from Dialogflow in the [form of the response](#) to a user query matched by intents with webhook enabled. Be sure that your web service meets all the [webhook requirements](#).

[Webhook example](#)

Inline Editor (Powered by Cloud Functions for Firebase)

DISABLED

Build and manage fulfillment directly in Dialogflow via Cloud Functions for Firebase. [Docs](#)

index.js package.json

```
1 'use strict';
2
3 const functions = require('firebase-functions'); // Cloud Functions for Firebase
4 const DialogflowApp = require('actions-on-google').DialogflowApp; // Google Assistant
5
6 const googleAssistantRequest = 'google'; // Constant to identify Google Assistant
7
8 exports.dialogflowFirebaseFulfillment = functions.https.onRequest((request, response) => {
9   console.log('Request headers: ' + JSON.stringify(request.headers));
10  console.log('Request body: ' + JSON.stringify(request.body));
11
12  // An action is a string used to identify what needs to be done in fulfillment
13  let action = request.body.result.action; // https://dialogflow.com/docs/actions-and-
14
15  // Parameters are any entities that Dialogflow has extracted from the request.
16  const parameters = request.body.result.parameters; // https://dialogflow.com/docs
```

Try it now

🔔 Please use test console above to try a sentence.

What Next?

Training

Improve your agent by learning
from user interaction

Contexts

Use contexts to follow through
user conversation

Robotron



en



Intents



Entities


 Training ^[beta]

Integrations

 Analytics ^[new]

Fulfillment

Support

Account

Logout

Motion

SAVE



Try it now

Contexts



User says

Search in user says



” Add user expression

” can you move a step back?

” move backwards

” go two steps forward

 Events [?]


Add event

Action



robot.move

 REQUIRED [?]

 PARAMETER NAME [?]

 ENTITY [?]

VALUE

 IS LIST [?]

Agent

Domains

USER SAYS

COPY CURL

move back twice

DEFAULT RESPONSE



PLAY

Moving backward

INTENT

Motion

ACTION

robot.move

PARAMETER

VALUE





direction

backward


number

[]

SHOW JSON

Robotron  en  Intents  Entities  Training ^[beta] Integrations Analytics ^[new] Fulfillment Support Support Account LogoutTraining  

There are no logs to train upon. Test your agent in the test console to generate the first logs.

 Please use test console above to try a sentence.

THANKS FOR LISTENING

Contact Details

Email: davash001@gmail.com

Twitter Handle: @david_asamu

Phone Number: +2347068310640



THANK YOU