# Mycroft Documentation

***Release 0.1.0***

**Matthew Scholefield**

**Jul 18, 2019**

# Contents:

*Reference for the Mycroft Skills API*

CHAPTER 1

# mycroft package

CHAPTER 2

# mycroft.skills

## 2.1 MycroftSkill class - Base class for all Mycroft skills

**class** mycroft.**MycroftSkill**(*name=None*, *bus=None*, *use_settings=True*)

Base class for mycroft skills providing common behaviour and parameters to all Skill implementations.

For information on how to get started with creating mycroft skills see https://https://mycroft.ai/documentation/skills/introduction-developing-skills/

**Parameters**

- **name** (*str*) – skill name
- **bus** (*MycroftWebsocketClient*) – Optional bus connection

**acknowledge**()

Acknowledge a successful request.

This method plays a sound to acknowledge a request that does not require a verbal response. This is intended to provide simple feedback to the user that their request was handled successfully.

**add_event**(*name*, *handler*, *handler_info=None*, *once=False*)

Create event handler for executing intent

**Parameters**

- **name** (*string*) – IntentParser name
- **handler** (*func*) – Method to call
- **handler_info** (*string*) – Base message when reporting skill event handler status on messagebus.
- **once** (*bool, optional*) – Event handler will be removed after it has been run once.

**ask_yesno**(*prompt*, *data=None*)

Read prompt and wait for a yes/no answer

This automatically deals with translation and common variants, such as 'yeah', 'sure', etc.

**Parameters** **prompt** (*str*) – a dialog id or string to read

**Returns**

**'yes', 'no' or whatever the user response if not** one of those, including None

**Return type** string

**bind**(*bus*)
Register messagebus emitter with skill.

**Parameters** **bus** – Mycroft messagebus connection

**cancel_all_repeating_events**()
Cancel any repeating events started by the skill.

**cancel_scheduled_event**(*name*)
Cancel a pending event. The event will no longer be scheduled to be executed

**Parameters** **name** (*str*) – reference name of event (from original scheduling)

**config**
Provide deprecation warning when accessing config. TODO: Remove in 19.08

**config_core**
Mycroft global configuration. (dict)

**converse**(*utterances*, *lang=None*)
Handle conversation.

This method gets a peek at utterances before the normal intent handling process after a skill has been invoked once.

To use, override the converse() method and return True to indicate that the utterance has been handled.

**Parameters**

- **utterances** (*list*) – The utterances from the user. If there are multiple utterances, consider them all to be transcription possibilities. Commonly, the first entry is the user utt and the second is normalized() version of the first utterance
- **lang** – language the utterance is in, None for default

**Returns** True if an utterance was handled, otherwise False

**Return type** bool

**default_shutdown**()
Parent function called internally to shut down everything.

Shuts down known entities and calls skill specific shutdown method.

**disable_intent**(*intent_name*)
Disable a registered intent if it belongs to this skill

**Parameters** **intent_name** (*string*) – name of the intent to be disabled

**Returns** True if disabled, False if it wasn't registered

**Return type** bool

**enable_intent**(*intent_name*)
(Re)Enable a registered intent if it belongs to this skill

**Parameters** **intent_name** – name of the intent to be enabled

**Returns** True if enabled, False if it wasn't registered

**Return type** bool

**file_system**
Filesystem access to skill specific folder. See mycroft.filesystem for details.

**find_resource**(*res_name*, *res_dirname=None*)
Find a resource file

Searches for the given filename using this scheme: 1) Search the resource lang directory:

<skill>/<res_dirname>/<lang>/<res_name>

2) **Search the resource directory:** <skill>/<res_dirname>/<res_name>

3) **Search the locale lang directory or other subdirectory:** <skill>/locale/<lang>/<res_name> or <skill>/locale/<lang>/. . . /<res_name>

**Parameters**

- **res_name** (*string*) – The resource name to be found
- **res_dirname** (*string, optional*) – A skill resource directory, such 'dialog', 'vocab', 'regex' or 'ui'. Defaults to None.

**Returns** The full path to the resource file or None if not found

**Return type** string

**get_intro_message**()
Get a message to speak on first load of the skill.

Useful for post-install setup instructions.

**Returns** message that will be spoken to the user

**Return type** str

**get_response**(*dialog=''*, *data=None*, *validator=None*, *on_fail=None*, *num_retries=-1*)
Prompt user and wait for response

The given dialog is spoken, followed immediately by listening for a user response. The response can optionally be validated before returning.

### Example

color = self.get_response('ask.favorite.color')

**Parameters**

- **dialog** (*str*) – Announcement dialog to speak to the user
- **data** (*dict*) – Data used to render the dialog
- **validator** (*any*) – Function with following signature def validator(utterance):

  return utterance != "red"

- **on_fail** (*any*) –

  **Dialog or function returning literal string** to speak on invalid input. For example:

  **def on_fail(utterance):** return "nobody likes the color red, pick another"

- **num_retries** (*int*) – Times to ask user for input, -1 for infinite NOTE: User can not respond and timeout or say "cancel" to stop

**Returns** User's reply or None if timed out or canceled

**Return type** str

**get_scheduled_event_status**(*name*)
Get scheduled event data and return the amount of time left

**Parameters** **name** (*str*) – reference name of event (from original scheduling)

**Returns** the time left in seconds

**Return type** int

**Raises** Exception – Raised if event is not found

**handle_disable_intent**(*message*)
Listener to disable a registered intent if it belongs to this skill

**handle_enable_intent**(*message*)
Listener to enable a registered intent if it belongs to this skill

**handle_remove_cross_context**(*message*)
Remove global context from intent service

**handle_set_cross_context**(*message*)
Add global context to intent service

**initialize**()
Perform any final setup needed for the skill.

Invoked after the skill is fully constructed and registered with the system.

**location**
Get the JSON data struction holding location information.

**location_pretty**
Get a more 'human' version of the location as a string.

**location_timezone**
Get the timezone code, such as 'America/Los_Angeles'

**log**
Skill logger instance

**make_active**()
Bump skill to active_skill list in intent_service

This enables converse method to be called even without skill being used in last 5 minutes.

**register_entity_file**(*entity_file*)
Register an Entity file with the intent service.

An Entity file lists the exact values that an entity can hold. For example:

=== ask.day.intent === Is it {weekend}?

=== weekend.entity === Saturday Sunday

**Parameters** **entity_file** (*string*) – name of file that contains examples of an entity. Must end with '.entity'

**register_intent**(*intent_parser*, *handler*)
Register an Intent with the intent service.

**Parameters**

- **intent_parser** – Intent or IntentBuilder object to parse utterance for the handler.

- **handler** (*func*) – function to register with intent

**register_intent_file**(*intent_file*, *handler*)
Register an Intent file with the intent service. For example:

=== food.order.intent === Order some {food}. Order some {food} from {place}. I'm hungry. Grab some {food} from {place}.

Optionally, you can also use <register_entity_file> to specify some examples of {food} and {place}

In addition, instead of writing out multiple variations of the same sentence you can write:

=== food.order.intent === (Order | Grab) some {food} (from {place} | ). I'm hungry.

**Parameters**

- **intent_file** – name of file that contains example queries that should activate the intent. Must end with '.intent'
- **handler** – function to register with intent

**register_regex**(*regex_str*)
Register a new regex. :param regex_str: Regex string

**register_resting_screen**()
Registers resting screen from the resting_screen_handler decorator.

This only allows one screen and if two is registered only one will be used.

**register_vocabulary**(*entity*, *entity_type*)
Register a word to a keyword

**Parameters**

- **entity** – word to register
- **entity_type** – Intent handler entity to tie the word to

**reload_skill**
allow reloading (default True)

**remove_context**(*context*)
remove a keyword from the context manager.

**remove_cross_skill_context**(*context*)
tell all skills to remove a keyword from the context manager.

**remove_event**(*name*)
Removes an event from bus emitter and events list

**Parameters** **name** (*string*) – Name of Intent or Scheduler Event

**Returns** True if found and removed, False if not found

**Return type** bool

**report_metric**(*name*, *data*)
Report a skill metric to the Mycroft servers

**Parameters**

- **name** (*str*) – Name of metric. Must use only letters and hyphens
- **data** (*dict*) – JSON dictionary to report. Must be valid JSON

**root_dir**
skill root directory

**schedule_event** (*handler*, *when*, *data=None*, *name=None*)
Schedule a single-shot event.

**Parameters**

- **handler** – method to be called
- **when** (*datetime/int/float*) – datetime (in system timezone) or number of seconds in the future when the handler should be called
- **data** (*dict, optional*) – data to send when the handler is called
- **name** (*str, optional*) – reference name NOTE: This will not warn or replace a previously scheduled event of the same name.

**schedule_repeating_event** (*handler*, *when*, *frequency*, *data=None*, *name=None*)
Schedule a repeating event.

**Parameters**

- **handler** – method to be called
- **when** (*datetime*) – time (in system timezone) for first calling the handler, or None to initially trigger <frequency> seconds from now
- **frequency** (*float/int*) – time in seconds between calls
- **data** (*dict, optional*) – data to send when the handler is called
- **name** (*str, optional*) – reference name, must be unique

**send_email** (*title*, *body*)
Send an email to the registered user's email

**Parameters**

- **title** (*str*) – Title of email
- **body** (*str*) – HTML body of email. This supports simple HTML like bold and italics

**set_context** (*context*, *word=''*, *origin=None*)
Add context to intent service

**Parameters**

- **context** – Keyword
- **word** – word connected to keyword

**set_cross_skill_context** (*context*, *word=''*)
Tell all skills to add a context to intent service

**Parameters**

- **context** – Keyword
- **word** – word connected to keyword

**shutdown** ()
This method is intended to be called during the skill process termination. The skill implementation must shutdown all processes and operations in execution.

**speak** (*utterance*, *expect_response=False*, *wait=False*)
Speak a sentence.

**Parameters**

- **utterance** (*str*) – sentence mycroft should speak

- **expect_response** (*bool*) – set to True if Mycroft should listen for a response immediately after speaking the utterance.
- **wait** (*bool*) – set to True to block while the text is being spoken.

**speak_dialog**(*key*, *data=None*, *expect_response=False*, *wait=False*)
Speak a random sentence from a dialog file.

**Parameters**

- **key** (*str*) – dialog file key (e.g. "hello" to speak from the file "locale/en-us/hello.dialog")
- **data** (*dict*) – information used to populate sentence
- **expect_response** (*bool*) – set to True if Mycroft should listen for a response immediately after speaking the utterance.
- **wait** (*bool*) – set to True to block while the text is being spoken.

**translate**(*text*, *data=None*)
Load a translatable single string resource

**The string is loaded from a file in the skill's dialog subdirectory** 'dialog/<lang>/<text>.dialog'

The string is randomly chosen from the file and rendered, replacing mustache placeholders with values found in the data dictionary.

**Parameters**

- **text** (*str*) – The base filename (no extension needed)
- **data** (*dict, optional*) – a JSON dictionary

**Returns** A randomly chosen string from the file

**Return type** str

**translate_list**(*list_name*, *data=None*)
Load a list of translatable string resources

The strings are loaded from a list file in the skill's dialog subdirectory.

'dialog/<lang>/<list_name>.list'

The strings are loaded and rendered, replacing mustache placeholders with values found in the data dictionary.

**Parameters**

- **list_name** (*str*) – The base filename (no extension needed)
- **data** (*dict, optional*) – a JSON dictionary

**Returns**

**The loaded list of strings with items in consistent** positions regardless of the language.

**Return type** list of str

**translate_namedvalues**(*name*, *delim=None*)
Load translation dict containing names and values.

This loads a simple CSV from the 'dialog' folders. The name is the first list item, the value is the second. Lines prefixed with # or // get ignored

**Parameters**

- **name** (*str*) – name of the .value file, no extension needed

- **delim** (*char*) – delimiter character used, default is ‘,’

**Returns** name and value dictionary, or empty dict if load fails

**Return type** dict

**translate_template**(*template_name*, *data=None*)
Load a translatable template

The strings are loaded from a template file in the skill’s dialog subdirectory.

‘dialog/<lang>/<template_name>.template’

The strings are loaded and rendered, replacing mustache placeholders with values found in the data dictionary.

**Parameters**

- **template_name** (*str*) – The base filename (no extension needed)
- **data** (*dict, optional*) – a JSON dictionary

**Returns** The loaded template file

**Return type** list of str

**update_scheduled_event**(*name*, *data=None*)
Change data of event.

**Parameters** **name** (*str*) – reference name of event (from original scheduling)

**voc_match**(*utt*, *voc_filename*, *lang=None*)
Determine if the given utterance contains the vocabulary provided

Checks for vocabulary match in the utterance instead of the other way around to allow the user to say things like “yes, please” and still match against “Yes.voc” containing only “yes”. The method first checks in the current skill’s .voc files and secondly the “res/text” folder of mycroft-core. The result is cached to avoid hitting the disk each time the method is called.

**Parameters**

- **utt** (*str*) – Utterance to be tested
- **voc_filename** (*str*) – Name of vocabulary file (e.g. ‘yes’ for ‘res/text/en-us/yes.voc’)
- **lang** (*str*) – Language code, defaults to self.long

**Returns** True if the utterance has the given vocabulary it

**Return type** bool

## 2.2 CommonIoTSkill class

**class** mycroft.skills.common_iot_skill.**CommonIoTSkill**(*name=None*, *bus=None*, *use_settings=True*)
Bases: mycroft.skills.core.MycroftSkill, abc.ABC

Skills that want to work with the CommonIoT system should extend this class. Subclasses will be expected to implement two methods, *can_handle* and *run_request*. See the documentation for those functions for more details on how they are expected to behave.

Subclasses may also register their own entities and scenes. See the register_entities and register_scenes methods for details.

This class works in conjunction with a controller skill. The controller registers vocabulary and intents to capture IoT related requests. It then emits messages on the messagebus that will be picked up by all skills that extend this class. Each skill will have the opportunity to declare whether or not it can handle the given request. Skills that acknowledge that they are capable of handling the request will be considered candidates, and after a short timeout, a winner, or winners, will be chosen. With this setup, a user can have several IoT systems, and control them all without worry that skills will step on each other.

**bind**(*bus*)
Overrides MycroftSkill.bind.

This is called automatically during setup, and need not otherwise be used.

Subclasses that override this method must call this via super in their implementation.

**Parameters** **bus** –

**can_handle**(*request: mycroft.skills.common_iot_skill.IoTRequest*)
Determine if an IoTRequest can be handled by this skill.

This method must be implemented by all subclasses.

An IoTRequest contains several properties (see the documentation for that class). This method should return True if and only if this skill can take the appropriate 'action' when considering _all other properties of the **request**_. In other words, a partial match, one in which any piece of the IoTRequest is not known to this skill, and is not None, this should return (False, None).

**Parameters** **request** – IoTRequest

**Returns: (boolean, dict)** True if and only if this skill knows about all the properties set on the IoTRequest, and a dict containing callback_data. If this skill is chosen to handle the request, this dict will be supplied to *run_request*.

Note that the dictionary will be sent over the bus, and thus must be JSON serializable.

**get_entities**() → [<class 'str'>]
Get a list of custom entities.

This is intended to be overridden by subclasses, though it it not required (the default implementation will return an empty list).

The strings returned by this function will be registered as ENTITY values with the intent parser. Skills should provide group names, user aliases for specific devices, or anything else that might represent a THING or a set of THINGs, e.g. 'bedroom', 'lamp', 'front door.' This allows commands that don't explicitly include a THING to still be handled, e.g. "bedroom off" as opposed to "bedroom lights off."

**get_scenes**() → [<class 'str'>]
Get a list of custom scenes.

This method is intended to be overridden by subclasses, though it is not required. The strings returned by this function will be registered as SCENE values with the intent parser. Skills should provide user defined scene names that they are aware of and capable of handling, e.g. "relax," "movie time," etc.

**register_entities_and_scenes**()
This method will register this skill's scenes and entities.

This should be called in the skill's *initialize* method, at some point after *get_entities* and *get_scenes* can be expected to return correct results.

**run_request**(*request: mycroft.skills.common_iot_skill.IoTRequest*, *callback_data: dict*)
Handle an IoT Request.

All subclasses must implement this method.

When this skill is chosen as a winner, this function will be called. It will be passed an IoTRequest equivalent to the one that was supplied to *can_handle*, as well as the *callback_data* returned by *can_handle*.

**Parameters**

- **request** – IoTRequest
- **callback_data** – dict

**speak**(*utterance*, **args*, ***kwargs*)
Speak a sentence.

**Parameters**

- **utterance** (*str*) – sentence mycroft should speak
- **expect_response** (*bool*) – set to True if Mycroft should listen for a response immediately after speaking the utterance.
- **wait** (*bool*) – set to True to block while the text is being spoken.

**supported_request_version**
Get the supported IoTRequestVersion

By default, this returns IoTRequestVersion.V1. Subclasses should override this to indicate higher levels of support.

The documentation for IoTRequestVersion provides a reference indicating which fields are included in each version. Note that you should always take the latest, and account for all request fields.

## 2.3 CommonPlaySkill class

**class** mycroft.skills.common_play_skill.**CommonPlaySkill**(*name=None*, *bus=None*)
Bases: mycroft.skills.core.MycroftSkill, abc.ABC

To integrate with the common play infrastructure of Mycroft skills should use this base class and override the two methods *CPS_match_query_phrase* (for checking if the skill can play the utterance) and *CPS_start* for launching the media.

The class makes the skill available to queries from the mycroft-playback-control skill and no special vocab for starting playback is needed.

**CPS_match_query_phrase**(*phrase*)
Analyze phrase to see if it is a play-able phrase with this skill.

**Parameters** **phrase** (*str*) – User phrase uttered after "Play", e.g. "some music"

**Returns**

**Tuple containing** a string with the appropriate matching phrase, the PlayMatch type, and optionally data to return in the callback if the match is selected.

**Return type** (match, CPSMatchLevel[, callback_data]) or None

**CPS_play**(**args*, ***kwargs*)
Begin playback of a media file or stream

**Normally this method will be invoked with somthing like:** self.CPS_play(url)

**Advanced use can also include keyword arguments, such as:** self.CPS_play(url, repeat=True)

**Parameters** **as the Audioservice.play method**(*same*) –

**CPS_start** (*phrase*, *data*)
Begin playing whatever is specified in 'phrase'

**Parameters**

- **phrase** (*str*) – User phrase uttered after "Play", e.g. "some music"
- **data** (*dict*) – Callback data specified in match_query_phrase()

**bind** (*bus*)
Overrides the normal bind method. Adds handlers for play:query and play:start messages allowing interaction with the playback control skill.

This is called automatically during setup, and need not otherwise be used.

## 2.4 CommonQuerySkill class

**class** mycroft.skills.common_query_skill.**CommonQuerySkill** (*name=None*, *bus=None*)
Bases: mycroft.skills.core.MycroftSkill, abc.ABC

Question answering skills should be based on this class. The skill author needs to implement *CQS_match_query_phrase* returning an answer and can optionally implement *CQS_action* to perform additional actions if the skill's answer is selected.

This class works in conjunction with skill-query which collects answers from several skills presenting the best one available.

**CQS_action** (*phrase*, *data*)
Take additional action IF the skill is selected. The speech is handled by the common query but if the chosen skill wants to display media, set a context or prepare for sending information info over e-mail this can be implemented here.

**Parameters**

- **phrase** (*str*) – User phrase uttered after "Play", e.g. "some music"
- **data** (*dict*) – Callback data specified in match_query_phrase()

**CQS_match_query_phrase** (*phrase*)
Analyze phrase to see if it is a play-able phrase with this skill. Needs to be implemented by the skill.

**Parameters** **phrase** (*str*) – User phrase uttered after "Play", e.g. "some music"

**Returns**

**Tuple containing** a string with the appropriate matching phrase, the PlayMatch type, and optionally data to return in the callback if the match is selected.

**Return type** (match, CQSMatchLevel[, callback_data]) or None

**bind** (*bus*)
Overrides the default bind method of MycroftSkill.

This registers messagebus handlers for the skill during startup but is nothing the skill author needs to consider.

## 2.5 FallbackSkill class

**class** mycroft.**FallbackSkill** (*name=None*, *bus=None*, *use_settings=True*)
Bases: mycroft.skills.core.MycroftSkill

Fallbacks come into play when no skill matches an Adapt or closely with a Padatious intent. All Fallback skills work together to give them a view of the user's utterance. Fallback handlers are called in an order determined the priority provided when the the handler is registered.

| Priority | Who? | Purpose |
|---|---|---|
| 1-4 | RESERVED | Unused for now, slot for pre-Padatious if needed |
| 5 | MYCROFT | Padatious near match (conf > 0.8) |
| 6-88 | USER | General |
| 89 | MYCROFT | Padatious loose match (conf > 0.5) |
| 90-99 | USER | Uncaught intents |
| 100+ | MYCROFT | Fallback Unknown or other future use |

Handlers with the numerically lowest priority are invoked first. Multiple fallbacks can exist at the same priority, but no order is guaranteed.

A Fallback can either observe or consume an utterance. A consumed utterance will not be see by any other Fallback handlers.

**default_shutdown**()
Remove all registered handlers and perform skill shutdown.

**classmethod make_intent_failure_handler**(*bus*)
Goes through all fallback handlers until one returns True

**register_fallback**(*handler*, *priority*)
register a fallback with the list of fallback handlers and with the list of handlers registered by this instance

**classmethod remove_fallback**(*handler_to_del*)
Remove a fallback handler

**Parameters** **handler_to_del** – reference to handler

**remove_instance_handlers**()
Remove all fallback handlers registered by the fallback skill.

## 2.6 AudioService class

**class** mycroft.skills.audioservice.**AudioService**(*bus*)
Bases: object

AudioService class for interacting with the audio subsystem

**Parameters** **bus** – Mycroft messagebus connection

**available_backends**()
Return available audio backends.

**Returns** dict with backend names as keys

**next**()
Change to next track.

**pause**()
Pause playback.

**play**(*tracks=None*, *utterance=None*, *repeat=None*)
Start playback.

**Parameters**

- **tracks** – track uri or list of track uri's Each track can be added as a tuple with (uri, mime) to give a hint of the mime type to the system
- **utterance** – forward utterance for further processing by the audio service.
- **repeat** – if the playback should be looped

**prev**()
Change to previous track.

**queue**(*tracks=None*)
Queue up a track to playing playlist.

**Parameters** **tracks** – track uri or list of track uri's

**resume**()
Resume paused playback.

**seek**(*seconds=1*)
seek X seconds

**Args:** seconds (int): number of seconds to seek, if negative rewind

**seek_backward**(*seconds=1*)
rewind X seconds

**Args:** seconds (int): number of seconds to rewind

**seek_forward**(*seconds=1*)
skip ahead X seconds

**Args:** seconds (int): number of seconds to skip

**stop**()
Stop the track.

**track_info**()
Request information of current playing track.

**Returns** Dict with track info.

## 2.7 intent_handler decorator

mycroft.**intent_handler**(*intent_parser*)
Decorator for adding a method as an intent handler.

## 2.8 intent_file_handler decorator

mycroft.**intent_file_handler**(*intent_file*)
Decorator for adding a method as an intent file handler.

## 2.9 adds_context decorator

mycroft.**adds_context**(*context*, *words=''*)
Adds context to context manager.

## 2.10 removes_context decorator

mycroft.**removes_context**(*context*)
Removes context from the context manager.

CHAPTER 3

# mycroft.util

## 3.1 mycroft.util package

The mycroft.util package includes functions for common operations such as playing audio files, parsting and creating natural text as well as many components used internally in Mycroft such as cache directory lookup, path resolution. etc.

Below _some_ of the functions that are of interest to skill developers are listed.

### 3.1.1 LOG

mycroft.util.**LOG**(*name*)

Custom logger class that acts like logging.Logger The logger name is automatically generated by the module of the caller

**Usage:**

```
>>> LOG.debug('My message: %s', debug_str)
13:12:43.673 - :<module>:1 - DEBUG - My message: hi
>>> LOG('custom_name').debug('Another message')
13:13:10.462 - custom_name - DEBUG - Another message
```

### 3.1.2 play_wav

mycroft.util.**play_wav**(*uri*)

Play a wav-file.

This will use the application specified in the mycroft config and play the uri passed as argument. The function will return directly and play the file in the background.

**Parameters** **uri** – uri to play

Returns: subprocess.Popen object

### 3.1.3 play_mp3

mycroft.util.**play_mp3**(*uri*)
Play a mp3-file.

This will use the application specified in the mycroft config and play the uri passed as argument. The function will return directly and play the file in the background.

**Parameters** **uri** – uri to play

Returns: subprocess.Popen object

### 3.1.4 play_ogg

mycroft.util.**play_ogg**(*uri*)
Play a ogg-file.

This will use the application specified in the mycroft config and play the uri passed as argument. The function will return directly and play the file in the background.

**Parameters** **uri** – uri to play

Returns: subprocess.Popen object

### 3.1.5 extract_datetime

mycroft.util.**extract_datetime**(*text*, *anchorDate=None*, *lang=None*, *default_time=None*)
Extracts date and time information from a sentence. Parses many of the common ways that humans express dates and times, including relative dates like "5 days from today", "tomorrow', and "Tuesday".

**Vague terminology are given arbitrary values, like:**

- morning = 8 AM
- afternoon = 3 PM
- evening = 7 PM

If a time isn't supplied or implied, the function defaults to 12 AM

**Parameters**

- **text** (*str*) – the text to be interpreted
- **anchorDate** (datetime, optional) – the date to be used for relative dating (for example, what does "tomorrow" mean?). Defaults to the current local date/time.
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default
- **default_time** (*datetime.time*) – time to use if none was found in the input string.

**Returns**

**'datetime' is the extracted date** as a datetime object in the user's local timezone. 'left-over_string' is the original phrase with all date and time related keywords stripped out. See examples for further clarification

Returns 'None' if no date or time related text is found.

**Return type** [datetime, str]

#### Examples

```
>>> extract_datetime(
... "What is the weather like the day after tomorrow?",
... datetime(2017, 06, 30, 00, 00)
... )
[datetime.datetime(2017, 7, 2, 0, 0), 'what is weather like']
```

```
>>> extract_datetime(
... "Set up an appointment 2 weeks from Sunday at 5 pm",
... datetime(2016, 02, 19, 00, 00)
... )
[datetime.datetime(2016, 3, 6, 17, 0), 'set up appointment']
```

```
>>> extract_datetime(
... "Set up an appointment",
... datetime(2016, 02, 19, 00, 00)
... )
None
```

### 3.1.6 extract_number

mycroft.util.**extract_number**(*text*, *short_scale=True*, *ordinals=False*, *lang=None*)

Takes in a string and extracts a number.

**Parameters**

- **text** (*str*) – the string to extract a number from
- **short_scale** (*bool*) – Use "short scale" or "long scale" for large numbers – over a million. The default is short scale, which is now common in most English speaking countries. See https://en.wikipedia.org/wiki/Names_of_large_numbers
- **ordinals** (*bool*) – consider ordinal numbers, e.g. third=3 instead of 1/3
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default

**Returns**

**The number extracted or False if the input** text contains no numbers

**Return type** (int, float or False)

### 3.1.7 normalize

mycroft.util.**normalize**(*text*, *lang=None*, *remove_articles=True*)

Prepare a string for parsing

This function prepares the given text for parsing by making numbers consistent, getting rid of contractions, etc.

**Parameters**

- **text** (*str*) – the string to normalize
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default
- **remove_articles** (*bool*) – whether to remove articles (like 'a', or 'the'). True by default.

**Returns** The normalized string.

**Return type** (str)

### 3.1.8 nice_number

mycroft.util.**nice_number**(*number*, *lang=None*, *speech=True*, *denominators=None*)
Format a float to human readable functions

This function formats a float to human understandable functions. Like 4.5 becomes 4 and a half for speech and 4 1/2 for text :param number: the float to format :type number: int or float :param lang: code for the language to use :type lang: str :param speech: format for speech (True) or display (False) :type speech: bool :param denominators: denominators to use, default [1 .. 20] :type denominators: iter of ints

**Returns** The formatted string.

**Return type** (str)

### 3.1.9 resolve_resource_file

mycroft.util.**resolve_resource_file**(*res_name*)
Convert a resource into an absolute filename.

Resource names are in the form: 'filename.ext' or 'path/filename.ext'

The system wil look for ~/.mycroft/res_name first, and if not found will look at /opt/mycroft/res_name, then finally it will look for res_name in the 'mycroft/res' folder of the source code package.

Example: With mycroft running as the user 'bob', if you called

resolve_resource_file('snd/beep.wav')

it would return either '/home/bob/.mycroft/snd/beep.wav' or '/opt/mycroft/snd/beep.wav' or '.../mycroft/res/snd/beep.wav', where the '...' is replaced by the path where the package has been installed.

**Parameters** **res_name** (*str*) – a resource path/name

**Returns** path to resource or None if no resource found

**Return type** str

### 3.1.10 get_cache_directory

mycroft.util.**get_cache_directory**(*domain=None*)
Get a directory for caching data

This directory can be used to hold temporary caches of data to speed up performance. This directory will likely be part of a small RAM disk and may be cleared at any time. So code that uses these cached files must be able to fallback and regenerate the file.

**Parameters** **domain** (*str*) – The cache domain. Basically just a subdirectory.

**Returns** a path to the directory where you can cache data

**Return type** str

## 3.2 mycroft.util.log

Mycroft Logging module.

This module provides the LOG pseudo function quickly creating a logger instance for use.

The default log level of the logger created here can ONLY be set in /etc/mycroft/mycroft.conf or ~/.mycroft/mycroft.conf

The default log level can also be programatically be changed by setting the LOG.level parameter.

**class** mycroft.util.log.**LOG**(*name*)

Custom logger class that acts like logging.Logger The logger name is automatically generated by the module of the caller

**Usage:**

```
>>> LOG.debug('My message: %s', debug_str)
13:12:43.673 - :<module>:1 - DEBUG - My message: hi
>>> LOG('custom_name').debug('Another message')
13:13:10.462 - custom_name - DEBUG - Another message
```

**classmethod debug**(**args*, ***kwargs*)

Log 'msg % args' with severity 'DEBUG'.

To pass exception information, use the keyword argument exc_info with a true value, e.g.

logger.debug("Houston, we have a %s", "thorny problem", exc_info=1)

**classmethod error**(**args*, ***kwargs*)

Log 'msg % args' with severity 'ERROR'.

To pass exception information, use the keyword argument exc_info with a true value, e.g.

logger.error("Houston, we have a %s", "major problem", exc_info=1)

**classmethod exception**(**args*, ***kwargs*)

Convenience method for logging an ERROR with exception information.

**classmethod info**(**args*, ***kwargs*)

Log 'msg % args' with severity 'INFO'.

To pass exception information, use the keyword argument exc_info with a true value, e.g.

logger.info("Houston, we have a %s", "interesting problem", exc_info=1)

**classmethod init**()

Initializes the class, sets the default log level and creates the required handlers.

**classmethod warning**(**args*, ***kwargs*)

Log 'msg % args' with severity 'WARNING'.

To pass exception information, use the keyword argument exc_info with a true value, e.g.

logger.warning("Houston, we have a %s", "bit of a problem", exc_info=1)

mycroft.util.log.**getLogger**(*name='MYCROFT'*)

Depreciated. Use LOG instead

## 3.3 mycroft.util.parse

The mycroft.util.parse module provides various parsing functions for things like numbers, times, durations etc.

The focus of these parsing functions is to extract data from natural speech and to allow localization.

mycroft.util.parse.**extract_datetime**(*text*, *anchorDate=None*, *lang=None*, *default_time=None*)

Extracts date and time information from a sentence. Parses many of the common ways that humans express dates and times, including relative dates like "5 days from today", "tomorrow', and "Tuesday".

**Vague terminology are given arbitrary values, like:**

- morning = 8 AM
- afternoon = 3 PM
- evening = 7 PM

If a time isn't supplied or implied, the function defaults to 12 AM

**Parameters**

- **text** (*str*) – the text to be interpreted
- **anchorDate** (datetime, optional) – the date to be used for relative dating (for example, what does "tomorrow" mean?). Defaults to the current local date/time.
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default
- **default_time** (*datetime.time*) – time to use if none was found in the input string.

**Returns**

**'datetime' is the extracted date** as a datetime object in the user's local timezone. 'left-over_string' is the original phrase with all date and time related keywords stripped out. See examples for further clarification

Returns 'None' if no date or time related text is found.

**Return type** [datetime, str]

### Examples

```
>>> extract_datetime(
... "What is the weather like the day after tomorrow?",
... datetime(2017, 06, 30, 00, 00)
... )
[datetime.datetime(2017, 7, 2, 0, 0), 'what is weather like']
```

```
>>> extract_datetime(
... "Set up an appointment 2 weeks from Sunday at 5 pm",
... datetime(2016, 02, 19, 00, 00)
... )
[datetime.datetime(2016, 3, 6, 17, 0), 'set up appointment']
```

```
>>> extract_datetime(
... "Set up an appointment",
... datetime(2016, 02, 19, 00, 00)
... )
None
```

mycroft.util.parse.**extract_duration**(*text*, *lang=None*)

Convert an english phrase into a number of seconds

**Convert things like:** "10 minute" "2 and a half hours" "3 days 8 hours 10 minutes and 49 seconds"

into an int, representing the total number of seconds.

The words used in the duration will be consumed, and the remainder returned.

As an example, "set a timer for 5 minutes" would return (300, "set a timer for").

**Parameters**

- **text** (*str*) – string containing a duration
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default

**Returns** A tuple containing the duration and the remaining text not consumed in the parsing. The first value will be None if no duration is found. The text returned will have whitespace stripped from the ends.

**Return type** (timedelta, str)

mycroft.util.parse.**extract_number**(*text*, *short_scale=True*, *ordinals=False*, *lang=None*)

Takes in a string and extracts a number.

**Parameters**

- **text** (*str*) – the string to extract a number from
- **short_scale** (*bool*) – Use "short scale" or "long scale" for large numbers – over a million. The default is short scale, which is now common in most English speaking countries. See https://en.wikipedia.org/wiki/Names_of_large_numbers
- **ordinals** (*bool*) – consider ordinal numbers, e.g. third=3 instead of 1/3
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default

**Returns**

**The number extracted or False if the input** text contains no numbers

**Return type** (int, float or False)

mycroft.util.parse.**extract_numbers**(*text*, *short_scale=True*, *ordinals=False*, *lang=None*)

Takes in a string and extracts a list of numbers.

**Parameters**

- **text** (*str*) – the string to extract a number from
- **short_scale** (*bool*) – Use "short scale" or "long scale" for large numbers – over a million. The default is short scale, which is now common in most English speaking countries. See https://en.wikipedia.org/wiki/Names_of_large_numbers
- **ordinals** (*bool*) – consider ordinal numbers, e.g. third=3 instead of 1/3
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default

**Returns** list of extracted numbers as floats, or empty list if none found

**Return type** list

mycroft.util.parse.**fuzzy_match**(*x*, *against*)

Perform a 'fuzzy' comparison between two strings. :returns:

**match percentage – 1.0 for perfect match,** down to 0.0 for no match at all.

**Return type** float

mycroft.util.parse.**get_gender**(*word*, *context=''*, *lang=None*)
Guess the gender of a word

Some languages assign genders to specific words. This method will attempt to determine the gender, optionally using the provided context sentence.

**Parameters**

- **word** (*str*) – The word to look up
- **context** (*str, optional*) – String containing word, for context
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default

**Returns**

**The code "m" (male), "f" (female) or "n" (neutral) for the gender,** or None if unknown/or unused in the given language.

**Return type** str

mycroft.util.parse.**match_one**(*query*, *choices*)
Find best match from a list or dictionary given an input

**Parameters**

- **query** – string to test
- **choices** – list or dictionary of choices

Returns: tuple with best match, score

mycroft.util.parse.**normalize**(*text*, *lang=None*, *remove_articles=True*)
Prepare a string for parsing

This function prepares the given text for parsing by making numbers consistent, getting rid of contractions, etc.

**Parameters**

- **text** (*str*) – the string to normalize
- **lang** (*str*) – the BCP-47 code for the language to use, None uses default
- **remove_articles** (*bool*) – whether to remove articles (like 'a', or 'the'). True by default.

**Returns** The normalized string.

**Return type** (str)

Parsing functions for extracting data from natural speech.

## 3.4 mycroft.util.format

The mycroft.util.format module provides various formatting functions for things like numbers, times, etc.

The focus of these formatting functions is to create natural sounding speech and allow localization.

mycroft.util.format.**NUMBER_TUPLE**
alias of mycroft.util.format.number

mycroft.util.format.**expand_options**(*parentheses_line: str*) → list
Convert 'test (alb)' -> ['test a', 'test b'] :param parentheses_line: Input line to expand

**Returns** List of expanded possibilities

mycroft.util.format.**join_list**(*items*, *connector*, *sep=None*, *lang=None*)
Join a list into a phrase using the given connector word

### Examples

join_list([1,2,3], "and") -> "1, 2 and 3" join_list([1,2,3], "and", ";") -> "1; 2 and 3"

**Parameters**

- **items** (*array*) – items to be joined
- **connector** (*str*) – connecting word (resource name), like "and" or "or"
- **sep** (*str, optional*) – separator character, default = ","

**Returns** the connected list phrase

**Return type** str

mycroft.util.format.**nice_date**(*dt*, *lang=None*, *now=None*)
Format a datetime to a pronounceable date

For example, generates 'tuesday, june the fifth, 2018' :param dt: date to format (assumes already in local timezone) :type dt: datetime :param lang: the language to use, use Mycroft default language if not

provided

**Parameters** **now** (*datetime*) – Current date. If provided, the returned date for speech will be shortened accordingly: No year is returned if now is in the same year as td, no month is returned if now is in the same month as td. If now and td is the same day, 'today' is returned.

**Returns** The formatted date string

**Return type** (str)

mycroft.util.format.**nice_date_time**(*dt*, *lang=None*, *now=None*, *use_24hour=False*, *use_ampm=False*)
Format a datetime to a pronounceable date and time

For example, generate 'tuesday, june the fifth, 2018 at five thirty'

**Parameters**

- **dt** (*datetime*) – date to format (assumes already in local timezone)
- **lang** (*string*) – the language to use, use Mycroft default language if not provided
- **now** (*datetime*) – Current date. If provided, the returned date for speech will be shortened accordingly: No year is returned if now is in the same year as td, no month is returned if now is in the same month as td. If now and td is the same day, 'today' is returned.
- **use_24hour** (*bool*) – output in 24-hour/military or 12-hour format
- **use_ampm** (*bool*) – include the am/pm for 12-hour format

**Returns** The formatted date time string

**Return type** (str)

mycroft.util.format.**nice_duration**(*duration*, *lang=None*, *speech=True*)
Convert duration in seconds to a nice spoken timespan

### Examples

duration = 60 -> "1:00" or "one minute" duration = 163 -> "2:43" or "two minutes forty three seconds"

**Parameters**

- **duration** – time, in seconds
- **lang** (*str, optional*) – a BCP-47 language code, None for default
- **speech** (*bool*) – format for speech (True) or display (False)

**Returns** timespan as a string

**Return type** str

mycroft.util.format.**nice_number**(*number*, *lang=None*, *speech=True*, *denominators=None*)

Format a float to human readable functions

This function formats a float to human understandable functions. Like 4.5 becomes 4 and a half for speech and 4 1/2 for text :param number: the float to format :type number: int or float :param lang: code for the language to use :type lang: str :param speech: format for speech (True) or display (False) :type speech: bool :param denominators: denominators to use, default [1 .. 20] :type denominators: iter of ints

**Returns** The formatted string.

**Return type** (str)

mycroft.util.format.**nice_time**(*dt*, *lang=None*, *speech=True*, *use_24hour=False*, *use_ampm=False*)

Format a time to a comfortable human format

For example, generate 'five thirty' for speech or '5:30' for text display.

**Parameters**

- **dt** (*datetime*) – date to format (assumes already in local timezone)
- **lang** (*str*) – code for the language to use
- **speech** (*bool*) – format for speech (default/True) or display (False)
- **use_24hour** (*bool*) – output in 24-hour/military or 12-hour format
- **use_ampm** (*bool*) – include the am/pm for 12-hour format

**Returns** The formatted time string

**Return type** (str)

mycroft.util.format.**nice_year**(*dt*, *lang=None*, *bc=False*)

Format a datetime to a pronounceable year

For example, generate 'nineteen-hundred and eighty-four' for year 1984

**Parameters**

- **dt** (*datetime*) – date to format (assumes already in local timezone)
- **lang** (*string*) – the language to use, use Mycroft default language if
- **provided** (*not*) –
- **bc** (*bool*) – B.C. in datetime)

**Returns** The formatted year string

**Return type** (str)

mycroft.util.format.**pronounce_number**(*number*, *lang=None*, *places=2*, *short_scale=True*, *scientific=False*)

Convert a number to it's spoken equivalent

For example, '5' would be 'five'

**Parameters**

- **number** – the number to pronounce
- **short_scale** (*bool*) – use short (True) or long scale (False) https://en.wikipedia.org/wiki/Names_of_large_numbers
- **scientific** (*bool*) – convert and pronounce in scientific notation

**Returns** The pronounced number

**Return type** (str)

Formatting functions for producing natural speech from common datatypes such as numbers, dates and times.

## 3.5 mycroft.util.time

mycroft.util.time.**default_timezone**()

Get the default timezone

Based on user location settings location.timezone.code or the default system value if no setting exists.

**Returns** Definition of the default timezone

**Return type** (datetime.tzinfo)

mycroft.util.time.**now_local**(*tz=None*)

Retrieve the current time

**Parameters** **tz** (*datetime.tzinfo, optional*) – Timezone, default to user's settings

**Returns** The current time

**Return type** (datetime)

mycroft.util.time.**now_utc**()

Retrieve the current time in UTC

**Returns** The current time in Universal Time, aka GMT

**Return type** (datetime)

mycroft.util.time.**to_local**(*dt*)

Convert a datetime to the user's local timezone

**Parameters** **dt** (*datetime*) – A datetime (if no timezone, defaults to UTC)

**Returns** time converted to the local timezone

**Return type** (datetime)

mycroft.util.time.**to_system**(*dt*)

Convert a datetime to the system's local timezone

**Parameters** **dt** (*datetime*) – A datetime (if no timezone, assumed to be UTC)

**Returns** time converted to the operation system's timezone

**Return type** (datetime)

mycroft.util.time.**to_utc**(*dt*)

Convert a datetime with timezone info to a UTC datetime

**Parameters** **dt** (*datetime*) – A datetime (presumably in some local zone)

**Returns** time converted to UTC

**Return type** (datetime)

A collection of functions for handling local, system and global times.

# Python Module Index

## m

# Index

## S



## T



## U



## V



## W