

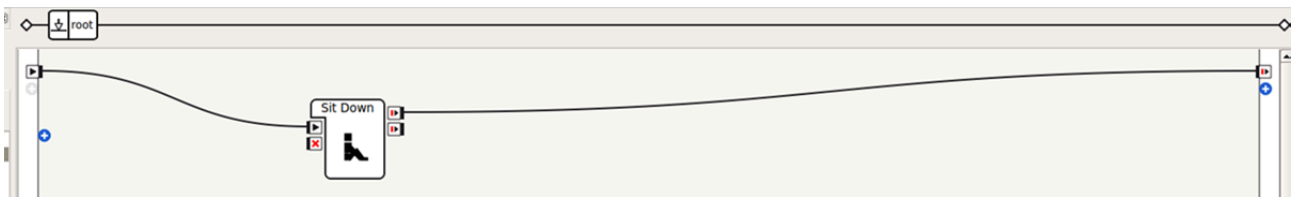
Programming NAO - Cheat Sheet

Connecting to the robot

Klick on the green “Wireless connection” symbol on top. In the Window that comes up, either click on the local robot (the blue one with dotted lines) for a simulation, or the green or red NAO for the real NAO. Sometimes it might warn you that the robot seems unresponsive and ask if you want to connect anyway – just click yes and it will connect.

Start a module

Simply click on the module in the left lower corner of the window and drag and drop it to the main window. Then draw a line from the little start symbol on the top left corner of your programming window to the incoming arrow of your box and another line from the outgoing arrow of your box to the top right finish symbol of your programming view. It should look like this:

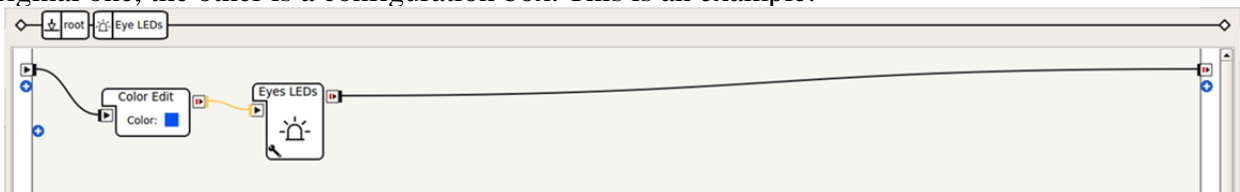


To start your program, just click on the green start button next to the wireless connection symbol on top menu bar.

Configure a module

There are three different types of configurations:

1. If the box has a little screw-wrench in its bottom left corner. You can click on it and a small window will open. In this window, you can set different parameters, like the distance the robot should walk or which LEDs to change.
2. If you double-click on the box, the box might split into two boxes – one box looks like the original one, the other is a configuration box. This is an example:



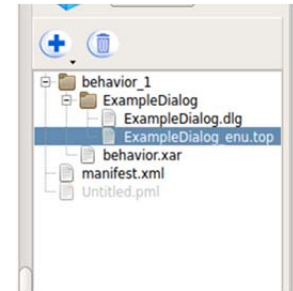
The left box is the configuration box. Here you can edit certain features, like the color of the LEDs. Important: The original box has not really been split. If you look above the boxes, you will notice that another small box has appeared to the right of the *root box*. That means you are in a sub-view of a certain box. In this view you can configure the box, but you cannot let the program run on the robot. So once you are done configuring the module, click on the little *root box* to change the view again and run the program.

3. If you double-click on the box, it might also open another window where you can change the source code of the box. Just change the source code in the editor and then close it again. You don't need to save anything, it will be saved automatically. If there is an error in your source code, it will show you a red error message in the *log viewer* to the bottom of your Choregraphe window when you try to run it.

Writing a dialog with the NAO

As we are representing the social robotics lab, writing a little dialog is a nice example for older kids. Just drag and drop the *Dialog box* from the Voice folder to the main programming field. You will also need the *Set Language box*. Select it and place it in front of the *Dialog box*. Now connect the start symbol with the *Set Language*, the *Set Language* with the *Dialog* and the *Dialog* with the finish symbol.

To edit the dialog, you need to open the *ExampleDialog_enu.top* file which you can find to the left. Double-click on it to open the editor.



The first thing you see is the definition of concepts. A concept means you define a concept name and then a variety of different options to say which represents the same concept. If an option consist of multiple words, they must start and end with quotation marks. Concepts can be used in the dialog in two different ways: They can either represent some input given by the human user or different options for the robot to respond (it will select one randomly).

Inside the dialog, the NAO can either react to what the human said or can make it's own proposal. With this line here the NAO will react to a user's input:

```
20 u: (~hello) ^start(animations/Stand/Gestures/Hey_1) ~hello ^wait(animations/Stand/Gestures/Hey_1) ^goto(howAreYou)
```

If the users says one of the phrases defined in the concept *hello*, it plays an animations, responds with a phrase from the concept *hello* and waits until the animation has finished playing. Then it proceeds to a proposal:

The

```
32 proposal: %showAreYou ^startTag(show) how are you today?  
33   ul: (~happy) I'm glad you are fine! ^goto(favoriteColor)  
34   ul: (~sad) Oh, I feel sorry for you. ^nextProposal  
35   ul: (~repeat) I'll repeat for you. ^sameProposal
```

proposal starts with a % followed by the name of the proposal. It is used to call the proposal from somewhere else in the script. A *tag* is only a set of different animations from which the robot will randomly pick one. You find a list of tags and animations you can use attached. It then asks a question and awaits one of the three answers the user can give. It will respond differently to each answer and then eventually proceed with the next proposal.

After you started the program, the robot will indicate that it is listening with a beep-sound and blue blinking eyes. After you said something, it will either respond in the way it is programmed or – if it did not understand what you said – will beep again to indicate you need to start talking again. Speak loud and clear and close to the robot to increase the chances it understands you. However, in the noisy environment it might be difficult to test it on the real robot. You can always test it with the simulator by typing in the command in the *Dialog view*.

Demonstration Mode

There will be a demonstration script for Choregraphe which you can use to show the abilities of the robot and engage them to work with you.

NAO - List of tags available by default

Tag	Matching animations
affirmative	Yes_1; Yes_2; Yes_3
alright	Yes_1; Yes_2; Yes_3
beg	Please_1
beseech	Please_1
body language	BodyTalk_1; BodyTalk_1; BodyTalk_10; BodyTalk_10; BodyTalk_11; BodyTalk_11; BodyTalk_12; BodyTalk_12; BodyTalk_13; BodyTalk_14; BodyTalk_15; BodyTalk_16; BodyTalk_17; BodyTalk_18; BodyTalk_19; BodyTalk_2; BodyTalk_2; BodyTalk_20; BodyTalk_21; BodyTalk_22; BodyTalk_3; BodyTalk_3; BodyTalk_4; BodyTalk_4; BodyTalk_5; BodyTalk_5; BodyTalk_6; BodyTalk_6; BodyTalk_7; BodyTalk_7; BodyTalk_8; BodyTalk_8; BodyTalk_9; BodyTalk_9; Explain_1; Explain_10; Explain_11; Explain_2; Explain_3; Explain_4; Explain_5; Explain_6; Explain_7; Explain_8; YouKnowWhat_1; YouKnowWhat_5
bow	BowShort_1
call	Hey_1; Hey_6
clear	Explain_1; Explain_10; Explain_11; Explain_2; Explain_3; Explain_4; Explain_5; Explain_6; Explain_7; Explain_8
enthusiastic	Enthusiastic_4; Enthusiastic_5
entreat	Please_1
explain	Explain_1; Explain_10; Explain_11; Explain_2; Explain_3; Explain_4; Explain_5; Explain_6; Explain_7; Explain_8; YouKnowWhat_1; YouKnowWhat_5
happy	Enthusiastic_4; Enthusiastic_5
hello	Hey_1; Hey_6
hey	Hey_1; Hey_6
hi	Hey_1; Hey_6
I	Me_1; Me_2
implore	Please_1
my	Me_1; Me_2
myself	Me_1; Me_2
negative	No_3; No_8; No_9
no	No_3; No_8; No_9
not know	IDontKnow_1; IDontKnow_2
ok	Yes_1; Yes_2; Yes_3
oppose	No_3; No_8; No_9
please	Please_1
present	Explain_1; Explain_10; Explain_11; Explain_2; Explain_3; Explain_4; Explain_5; Explain_6; Explain_7; Explain_8
rapturous	Enthusiastic_4; Enthusiastic_5
raring	Enthusiastic_4; Enthusiastic_5
refute	No_3; No_8; No_9

reject	No_3; No_8; No_9
rousing	Enthusiastic_4; Enthusiastic_5
show	You_1; You_4
supplicate	Please_1
unacquainted	IDontKnow_1; IDontKnow_2
undetermined	IDontKnow_1; IDontKnow_2
undiscovered	IDontKnow_1; IDontKnow_2
unfamiliar	IDontKnow_1; IDontKnow_2
unknown	IDontKnow_1; IDontKnow_2
warm	Enthusiastic_4; Enthusiastic_5
yeah	Yes_1; Yes_2; Yes_3
yes	Yes_1; Yes_2; Yes_3
yoo-hoo	Hey_1
you	You_1; You_4
your	You_1; You_4
zestful	Enthusiastic_4; Enthusiastic_5



NAO - List of animations available by default

Animation	Full name	Type	Tags
BodyTalk_1	animations/Sit/BodyTalk/BodyTalk_1	animation	body language
BodyTalk_10	animations/Sit/BodyTalk/BodyTalk_10	animation	body language
BodyTalk_11	animations/Sit/BodyTalk/BodyTalk_11	animation	body language
BodyTalk_12	animations/Sit/BodyTalk/BodyTalk_12	animation	body language
BodyTalk_2	animations/Sit/BodyTalk/BodyTalk_2	animation	body language
BodyTalk_3	animations/Sit/BodyTalk/BodyTalk_3	animation	body language
BodyTalk_4	animations/Sit/BodyTalk/BodyTalk_4	animation	body language
BodyTalk_5	animations/Sit/BodyTalk/BodyTalk_5	animation	body language
BodyTalk_6	animations/Sit/BodyTalk/BodyTalk_6	animation	body language
BodyTalk_7	animations/Sit/BodyTalk/BodyTalk_7	animation	body language
BodyTalk_8	animations/Sit/BodyTalk/BodyTalk_8	animation	body language
BodyTalk_9	animations/Sit/BodyTalk/BodyTalk_9	animation	body language
BodyTalk_1	animations/Stand/BodyTalk/BodyTalk_1	animation	body language
BodyTalk_10	animations/Stand/BodyTalk/BodyTalk_10	animation	body language
BodyTalk_11	animations/Stand/BodyTalk/BodyTalk_11	animation	body language
BodyTalk_12	animations/Stand/BodyTalk/BodyTalk_12	animation	body language
BodyTalk_13	animations/Stand/BodyTalk/BodyTalk_13	animation	body language
BodyTalk_14	animations/Stand/BodyTalk/BodyTalk_14	animation	body language
BodyTalk_15	animations/Stand/BodyTalk/BodyTalk_15	animation	body language
BodyTalk_16	animations/Stand/BodyTalk/BodyTalk_16	animation	body language
BodyTalk_17	animations/Stand/BodyTalk/BodyTalk_17	animation	body language
BodyTalk_18	animations/Stand/BodyTalk/BodyTalk_18	animation	body language
BodyTalk_19	animations/Stand/BodyTalk/BodyTalk_19	animation	body language
BodyTalk_2	animations/Stand/BodyTalk/BodyTalk_2	animation	body language
BodyTalk_20	animations/Stand/BodyTalk/BodyTalk_20	animation	body language
BodyTalk_21	animations/Stand/BodyTalk/BodyTalk_21	animation	body language
BodyTalk_22	animations/Stand/BodyTalk/BodyTalk_22	animation	body language
BodyTalk_3	animations/Stand/BodyTalk/BodyTalk_3	animation	body language
BodyTalk_4	animations/Stand/BodyTalk/BodyTalk_4	animation	body language
BodyTalk_5	animations/Stand/BodyTalk/BodyTalk_5	animation	body language
BodyTalk_6	animations/Stand/BodyTalk/BodyTalk_6	animation	body language
BodyTalk_7	animations/Stand/BodyTalk/BodyTalk_7	animation	body language
BodyTalk_8	animations/Stand/BodyTalk/BodyTalk_8	animation	body language
BodyTalk_9	animations/Stand/BodyTalk/BodyTalk_9	animation	body language

BowShort_1	animations/Stand/Gestures/BowShort_1	animation	bow
Enthusiastic_4	animations/Stand/Gestures/Enthusiastic_4	animation	enthusiastic; happy; rapturous; raring; rousing; warm; zestful
Enthusiastic_5	animations/Stand/Gestures/Enthusiastic_5	animation	enthusiastic; happy; rapturous; raring; rousing; warm; zestful
Explain_1	animations/Stand/Gestures/Explain_1	animation	body language; clear; explain; present
Explain_10	animations/Stand/Gestures/Explain_10	animation	body language; clear; explain; present
Explain_11	animations/Stand/Gestures/Explain_11	animation	body language; clear; explain; present
Explain_2	animations/Stand/Gestures/Explain_2	animation	body language; clear; explain; present
Explain_3	animations/Stand/Gestures/Explain_3	animation	body language; clear; explain; present
Explain_4	animations/Stand/Gestures/Explain_4	animation	body language; clear; explain; present
Explain_5	animations/Stand/Gestures/Explain_5	animation	body language; clear; explain; present
Explain_6	animations/Stand/Gestures/Explain_6	animation	body language; clear; explain; present
Explain_7	animations/Stand/Gestures/Explain_7	animation	body language; clear; explain; present
Explain_8	animations/Stand/Gestures/Explain_8	animation	body language; clear; explain; present
Hey_1	animations/Stand/Gestures/Hey_1	animation	call; hello; hey; hi; yoo-hoo
Hey_6	animations/Stand/Gestures/Hey_6	animation	call; hello; hey; hi
IDontKnow_1	animations/Stand/Gestures/IDontKnow_1	animation	not know; unacquainted; undetermined; undiscovered; unfamiliar; unknown
IDontKnow_2	animations/Stand/Gestures/IDontKnow_2	animation	not know; unacquainted; undetermined; undiscovered; unfamiliar; unknown
Me_1	animations/Stand/Gestures/Me_1	animation	I; me; my; myself
Me_2	animations/Stand/Gestures/Me_2	animation	I; me; my; myself
No_3	animations/Stand/Gestures/No_3	animation	negative; no; oppose; refute; reject
No_8	animations/Stand/Gestures/No_8	animation	negative; no; oppose; refute; reject
No_9	animations/Stand/Gestures/No_9	animation	negative; no; oppose; refute; reject
Please_1	animations/Stand/Gestures/Please_1	animation	beg; beseech; entreat; implore; please; supplicate
Yes_1	animations/Stand/Gestures/Yes_1	animation	affirmative; alright; ok; yeah; yes
Yes_2	animations/Stand/Gestures/Yes_2	animation	affirmative; alright; ok; yeah; yes
Yes_3	animations/Stand/Gestures/Yes_3	animation	affirmative; alright; ok; yeah; yes
YouKnowWhat_1	animations/Stand/Gestures/YouKnowWhat_1	animation	body language; explain
YouKnowWhat_5	animations/Stand/Gestures/YouKnowWhat_5	animation	body language; explain
You_1	animations/Stand/Gestures/You_1	animation	indicate; show; you; your
You_4	animations/Stand/Gestures/You_4	animation	indicate; show; you; your