# Using the Nao

## Installing software

The quickest and easiest way to start programming with the Nao is by using the Choregraphe software provided by Aldebaran.

1. Go to the Softbank community website: `https://community.ald.softbankrobotics.com/`

2. Log in with the account

   ```
   Email: a.visser@uva.nl
   Password: ask your teaching assistant for this
   ```

3. Go to Resources - Software and find the Choregraphe suite for the Nao.

4. Install the version compatible with your OS.

5. Go to Resources - Software and find the Python API for the Nao

6. Install the version compatible with your OS.

## Choregraphe

You can use Choregraphe with either a real robot or a simulation. To use a simulation connect to the localhost Nao you see in the connect tab. For using a real Nao you can take one from the lab and turn it on by pressing the chest button. It is possible that the robot does not have the Naoqi OS installed on it. To check if its compatible you can press the chest button after startup. If the robot starts talking it will be Choregraphe compatible, otherwise use a different robot or ask a teaching assistant for help.

If you have a robot ready you can connect it to your computer with an Ethernet cable. Check the connect tab to see if the robot is in the list. If the robot is in the list you can connect to it normally. If it is not you can press the chest button once. The robot should start to say its IP address which you can fill in in the "Use fixed IP/hostname" tab manually. If you happen to be using Linux you also need to switch your connection type to shared with other computers.

After connecting with either the virtual or real Nao you can start programming the Nao in either Python or C++ using Choregraphe. In the tab Help - Getting Started... you can find guides for basic scripting you can do. I would suggest testing your programs (especially programs that include moving the robot) on the virtual robot before you start working with the real one.
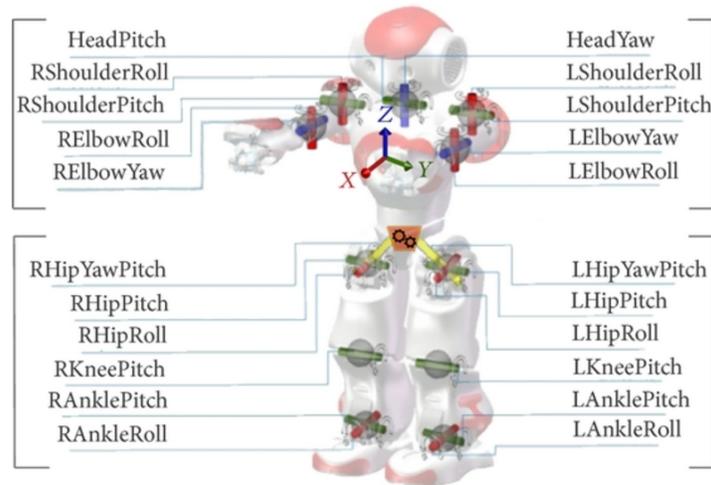


Figure 1: Joint overview of the Nao

# Troubleshoot

This are the steps to connect your laptop to the robot:

### Step 1

- Connect your computer to the access-point 'robolab' with the password on the whiteboard and on BlackBoard.

- Switch on a Nao robot. While booting it's ears got more blue.

- Wait till it says 'Knock Knock'.

- Touch the front button for 2 seconds. The robot will say it's name and its IP-address when it is connected to the internet.

If it can connect, write down the IP. Check if you can reach this IP by typing `ping IP`. If successfull Continue to Step 2. If the robot can't connect to the internet; make a wired connection from your computer to the robot.

- If you don't have an ethernet connection on your computer, borrow a usb-ethernet converter (and buy one on the internet).

- The leds on the back of the robot (at the ethernet connector) should indicate traffic. Touch the front button again, the robot will say an ip-address which typically starts with "192.168". Write down this IP.

- Check if you have a connection to the robot by typing on the commandline `ping IP` with the number that you wrote down.

If the ping fails, check your ethernet settings with `ifconfig`. It is possible that your computer received an IPv6 address, but not an IPv4 address. In that case set it manually with a IP-address in the same subdomain as the number you wrote down, only with another number after the last dot (in the domain 1-254).

Now you have a wired ethernet connection. Go to your favorite web-browser. Type in the address field the IP you wrote down. This will connect to a web-interface that will ask for a username and password (nao / nao). The wireless connection is available on the tab with the world icon. Refresh and select robolab. Give the password as written on the whiteboard and BlackBoard.

- If the robot complains that no wireless card is available, give it to a member of the Dutch Nao Team with the request to fix the wireless configuration.

Now you should be able to ping your robot via the wireless connection (IP starting with "146.50".

## Step 2

Start Choregraphe. Hit the green connection button. There should always be at least one Nao visible. The purple Nao head indicates a virtual nao running on your own machine. Green Nao heads indicate real Nao robots with NaoQi services running.

- If no green Nao head is visible, connect via 'Use fixed IP/hostname' and include in the field the IP that was written down (and was working with ping).

- If this fails, check the Show Details button and see what error message is displayed.

- If this is the 'Service "ALChoregraphe" (#1734) is already registered. Rejecting conflicting registration attempt'. error, kill the process naoqi-bin and restart Choregraphe.

Now you should have connection to the Nao robot and are ready to have some fun!