



Aldebaran and open source

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FOSDEM 2013

Aldebaran Robotics in a nutshell



- - **200 experts** : Engineers, PHDs, Sales & Marketing
- - **3000+ robots** around the globe



Hello, I'm NAO



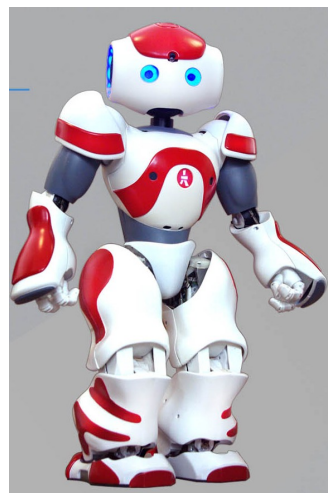
A Robot story



2006



2007



2007



Who is NAO?

MOVE

- 25 degrees of freedom
- smooth and precise coreless motors controlled by software
- complex movement capabilities

INTERACT

- 2 loudspeakers
- multiple LEDs
- tactile Sensors
- prehensile Hands
- infrared Sensors
- WIFI Connection



SENSE

- ▮ 2 HD camera
- ▮ 4 microphones
- ▮ 8 Force Sensing Resistors (FSR)
- ▮ Inertial Center
- ▮ 2 bumpers, 2 sonars

« THINK »

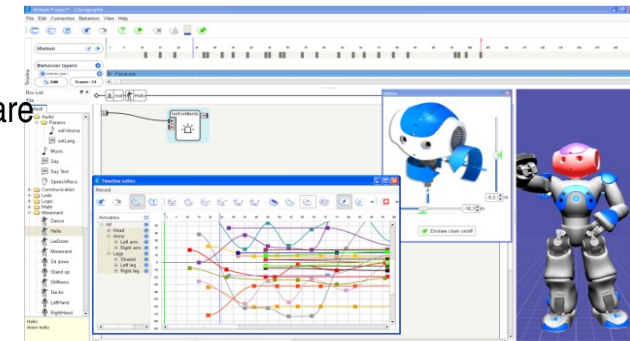
- Intel Atom 1,6 GHz CPU
- 1GB RAM
- 8GB flash memory
- Software suite



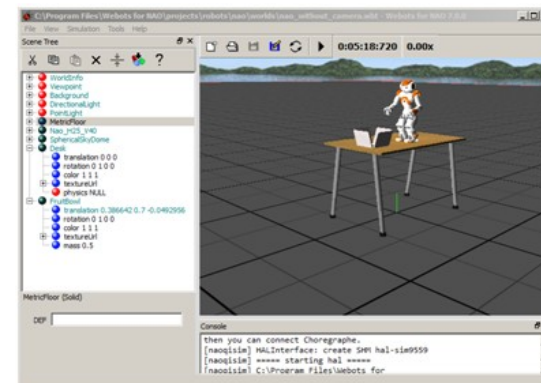
The product



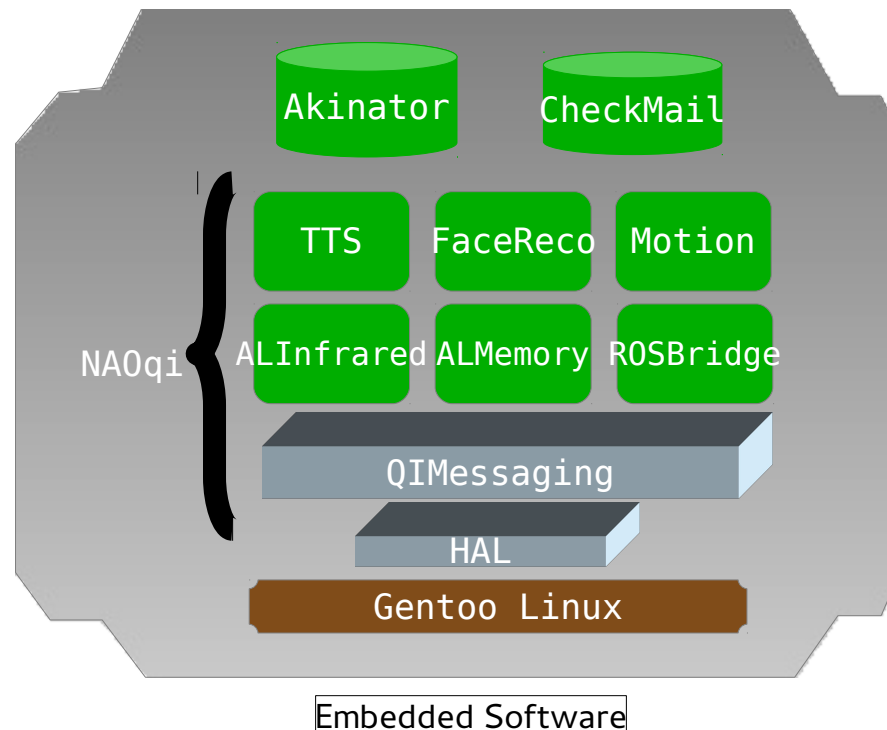
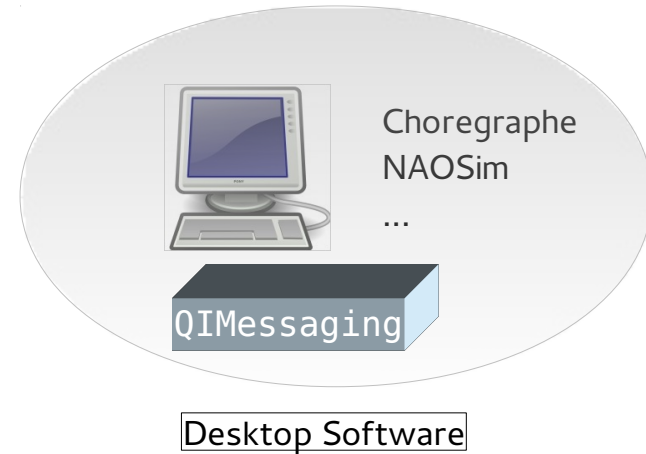
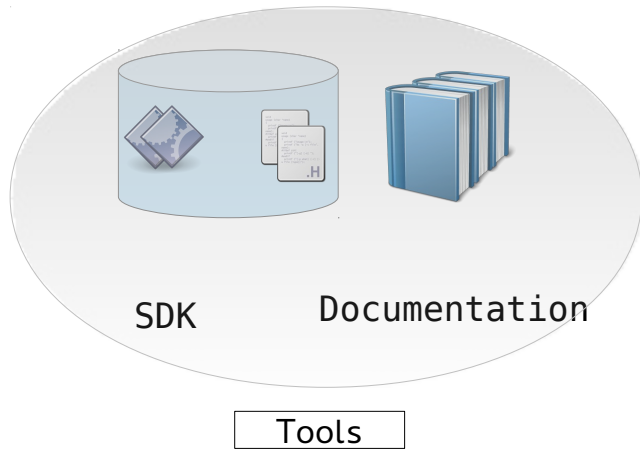
Powerful control software



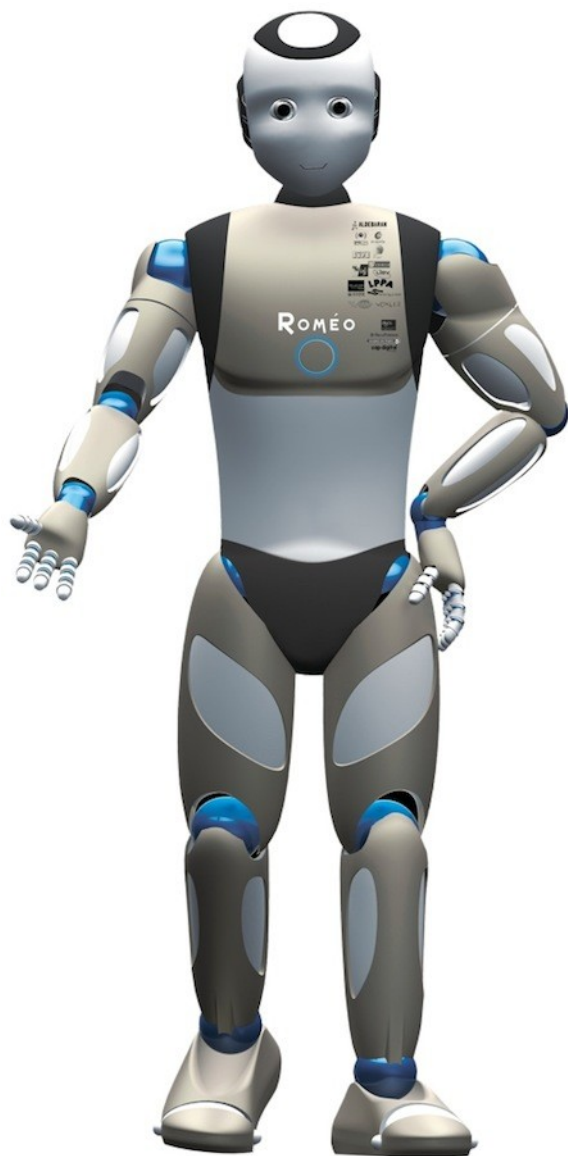
A dynamic User Community, with dedicated forums, updated documentation, NAO application sharing, support ...



Aldebaran Software: an overview

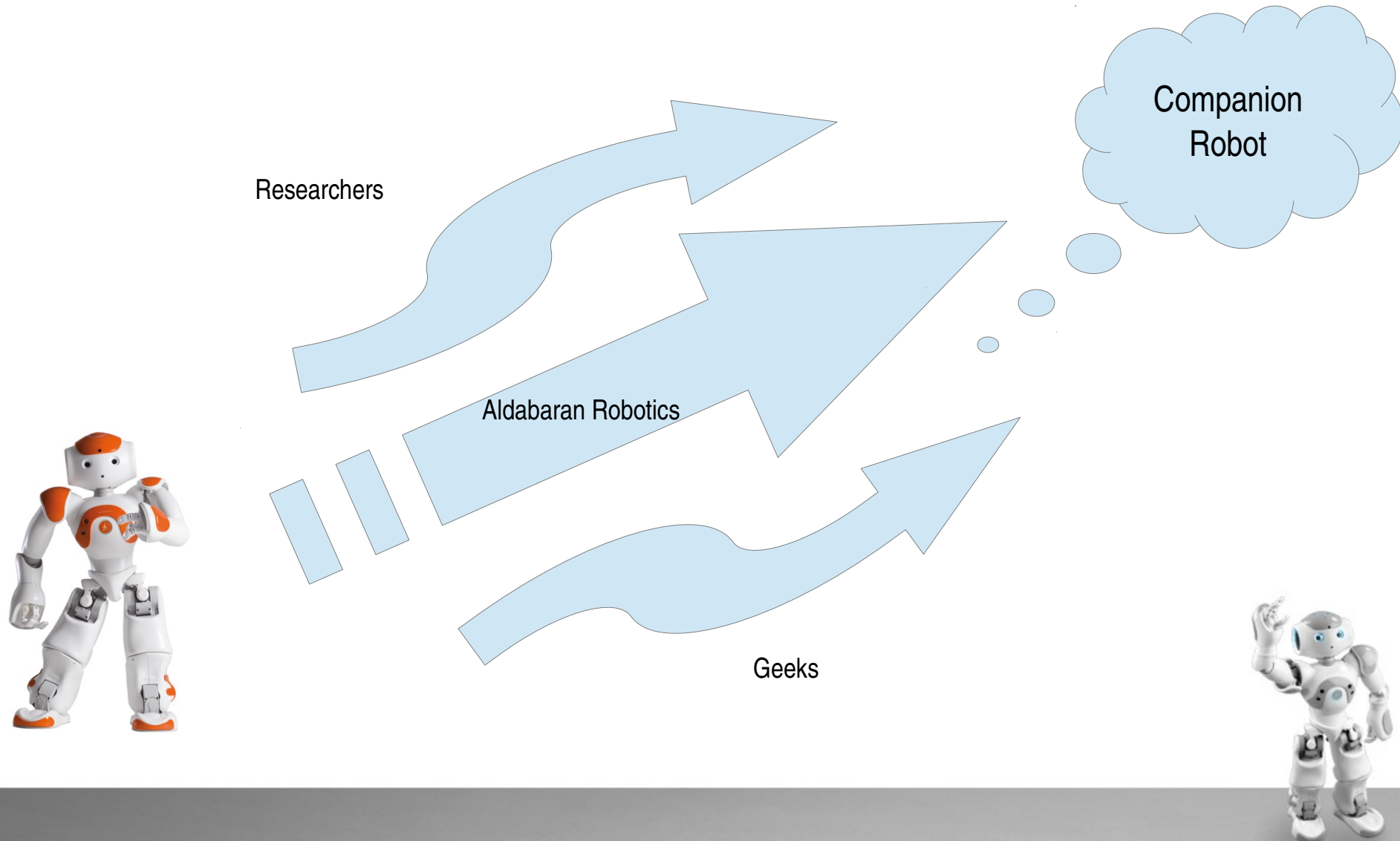


Not just NAO



The vision

Bring robots to people for the well being of mankind



Aldebaran and open sources: two stories



NAO and wifi

The dark ages:

Hackish shell scripts to configure wpa_supplicant

Buggy drivers



NAO and wifi

Now:

Nice kernel devs maintaining wireless_compat for us

Connman !

Active contributor at Aldebaran to conn

Autolink :)



A history of build systems



Linux: at the very beginning (2005 - 2007)

BuildRoot!

- the first real distribution we put on the robot;
- fine grain control over compilation;
- easy to use.

but... not enough packages at that time (2007)



Linux: open embedded (2008 - 2011)

A real distribution with

- still fine grain control over compilation;
- package manager (bitbake);
- embedded systems targeting;
- possibility to easily create our own packages.

Unfortunately...

- No support for binary packages
- No need for cross compilation... NAO runs on x86 :)

Some also considered WinCE...



Linux: gentoo (2012 - ...)

Switched to gentoo.

- stage3 -> chroot: it's just what we need
- portage
- many many packages available (most of our dependencies)
- close to upstream

So far so good!

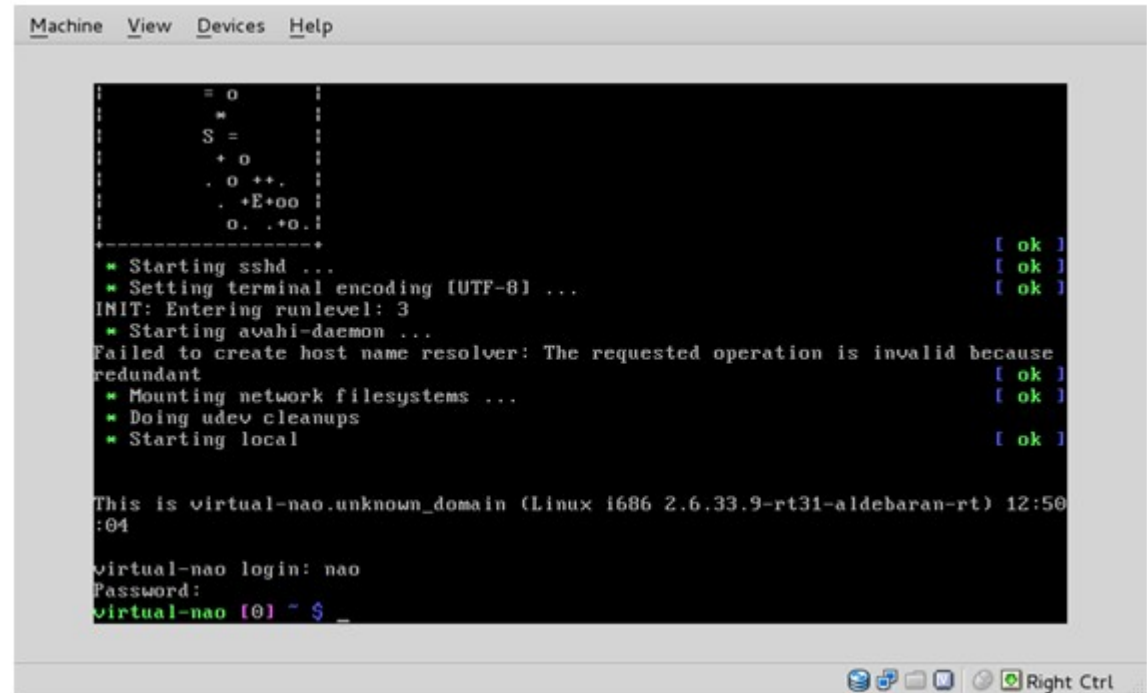


Towards open-source collaboration

The Opennao VM

Using thirdparty libraries has never been easier :)

No cross-compilation required!



```
Machine View Devices Help
= 0
*
S =
+ 0
. 0 ++
. +E+00
0. .+0.
-----+-----
* Starting sshd ... [ ok ]
* Setting terminal encoding [UTF-8] ... [ ok ]
INIT: Entering runlevel: 3
* Starting avahi-daemon ...
Failed to create host name resolver: The requested operation is invalid because
redundant [ ok ]
* Mounting network filesystems ... [ ok ]
* Doing udev cleanups
* Starting local [ ok ]

This is virtual-nao.unknown_domain (Linux i686 2.6.33.9-rt31-aldebaran-rt) 12:50
:04

virtual-nao login: nao
Password:
virtual-nao [0] ~ $ _
```



Open Build system

qiBuild : yet another build system for C++, but this one is better :)

- cross-plaform : Visual Studio, mingw, Linux, Mac, cross-compilation
- produce redistributable packages
- allow usage of pre-compile binary package (ala maven)
- qibuild deploy: remote debugging made easy



Using open tools

We could not have done it without them:

Django

CMake

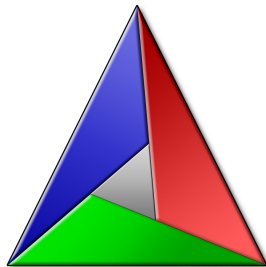
Python

Jenkins

Gerrit

crostool-NG

...



The screenshot shows a Gerrit web interface for a change with ID 15ce48b104f00a8b5ae95b26a26681af03fc5047f. The change is titled "qibuild configure: add --trace" and is currently in "Review in Progress" status. The owner is dmerekjowsky. The change is on the master branch of the qibuild project. The interface shows a list of reviewers: ncornu and gerit, both of whom have verified the change. Below the reviewers, there is a table of dependencies. The "Depends On" section shows a dependency on change 1968f9f95, titled "move cmake trace handling from qibuild.toc to qibuild.cmake". The "Needed By" section shows a dependency on change 1cdab8397, titled "qibuild configure: improve ui". At the bottom, there is a table for the patch set, showing the commit message and the diff for the files doc/source/changelog.rst, python/qibuild/actions/configure.py, and python/qibuild/cmake/init.py.

ID	Subject	Owner	Project	Branch	Updated
1968f9f95	move cmake trace handling from qibuild.toc to qibuild.cmake	dmerekjowsky	qibuild	master	2:36 PM
1cdab8397	qibuild configure: improve ui	dmerekjowsky	qibuild	master	1:01 PM

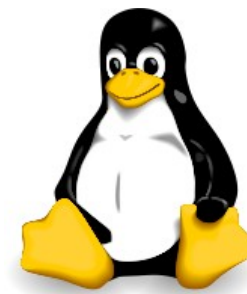
File Path	Comments	Size	Diff	Reviewed
Commit Message			Side-by-Side	Unified
doc/source/changelog.rst		+1,-0	Side-by-Side	Unified
python/qibuild/actions/configure.py		+11,-2	Side-by-Side	Unified
python/qibuild/cmake/init.py		+12,-7	Side-by-Side	Unified
python/qibuild/cmake/...		+4,-1	Side-by-Side	Unified

Created by us, improved by everybody

Now,

- Aldebaran is officially sharing code since May 11th, 2011;
- a few projects are accessible on github²;
- our linux kernel is available (with our modifications);
- qiBuildis released under 3-clause BSD license;
- more and more projects to come... ;)

¹ <http://developer.aldebaran-robotics.com/press/open/2> <https://github.com/aldebaran>



Towards an open SDK

```
@ui.timer("qibuild configure")
def do(args):
    """Main entry point"""
    if args.build_directory and not args.single:
        raise Exception("You should use --single "
                        "when specifying a build directory")

    if not args.cmake_flags:
        args.cmake_flags = list()
    if args.effective_cplusplus:
        args.cmake_flags.append("QI_EFFECTIVE_CPP=ON")
    if args.werror:
        args.cmake_flags.append("QI_WERROR=ON")
```



Our Developer Program

What you get with the program

The Developer Program is a privileged place for exchange between Aldebaran Robotics Developers and you! For a 3600 € fee sponsored by Aldebaran Robotic (instead of 12,000€), each participant receives:

Products NAO H25 (completely articulated)

Choregraphe

Simulator

SDK

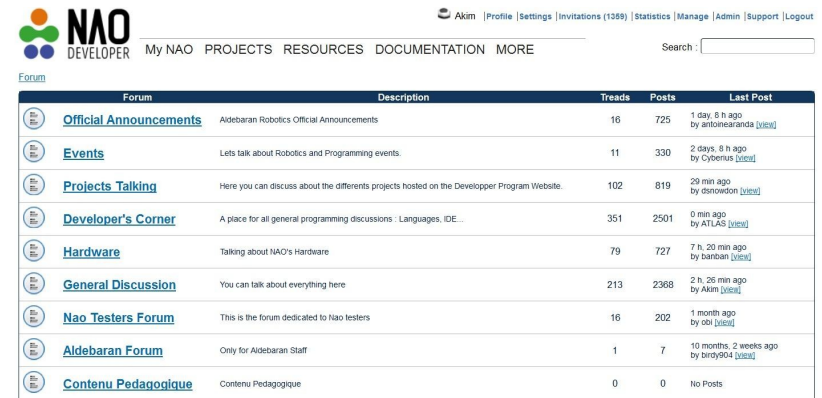
Resources Dedicated forum and project site

Access to source code

2 years warranty / support

Access to NAOstore

Annual NAO Dev Days



Forum	Description	Treads	Posts	Last Post
Official Announcements	Aldebaran Robotics Official Announcements	16	725	1 day, 6 h ago by antoinearanda [view]
Events	Lets talk about Robotics and Programming events.	11	330	2 days, 8 h ago by Cyberius [view]
Projects Talking	Here you can discuss about the differents projects hosted on the Developer Program Website.	102	819	29 min ago by dsnowdon [view]
Developer's Corner	A place for all general programming discussions : Languages, IDE...	351	2501	0 min ago by ATLAS [view]
Hardware	Talking about NAO's Hardware	79	727	7 h, 20 min ago by banban [view]
General Discussion	You can talk about everything here	213	2368	2 h, 26 min ago by Akim [view]
Nao Testers Forum	This is the forum dedicated to Nao testers	16	202	1 month ago by obi [view]
Aldebaran Forum	Only for Aldebaran Staff	1	7	10 months, 2 weeks ago by brody904 [view]
Contenu Pedagogique	Contenu Pedagogique	0	0	No Posts



NAO DEVELOPER

RECENTLY ADDED | BEST SELLERS | BE

MY NAO MY APPL [Update Subscriptions](#)

Applications

- Animation
- Audio
- Channels
- Fun
- Game
- Interactions
- Languages
- Network
- News Feeds
- Programming
- Radios
- Remote Control
- Therapy / Autism
- Vision

3 Musketeers story | Almanac | Behaviors Widget

Applications

- Catavan Palace
- Move Recorder
- BillDown
- Standup
- TaiChi dance
- Thriller dance
- Vangelis dance
- Autonomous Dancer
- Essentials channel
- NAO's Life Channel
- Studio test channel
- 3 Musketeers story
- Slot Machine
- StarWars story
- Animal Card Game
- Guess Sport
- Nao Memory
- Almanac



Nao dev days



We're hiring

SHAPE THE WORLD!

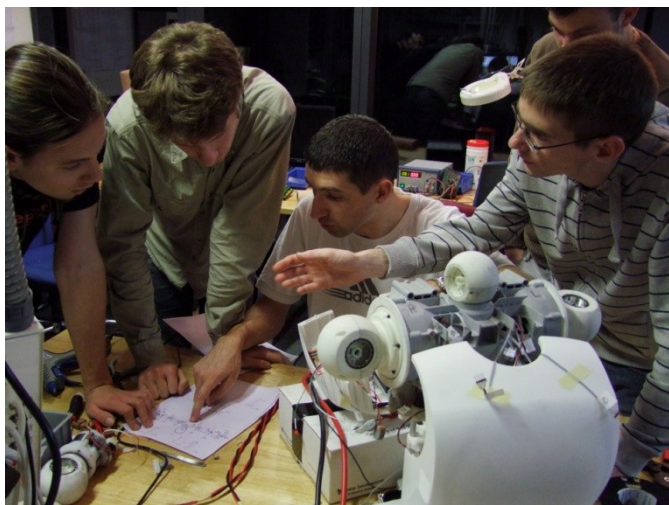
Go to:
<http://shapetheworld.fr>



Come and join us !



Work hard ...



Play hard !



Demo!

100 % open source stuff this time!



Useful links

Documentation

- <http://www.aldebaran-robotics.com/documentation/>

Github : all Aldebaran open source code will be here:

- <http://github.com/aldebaran>

my e-mail: dmerejkowsky@aldebaran-robotics.com

Join us:

www.shapetheworld.fr

Come and see our stand: AW 8

