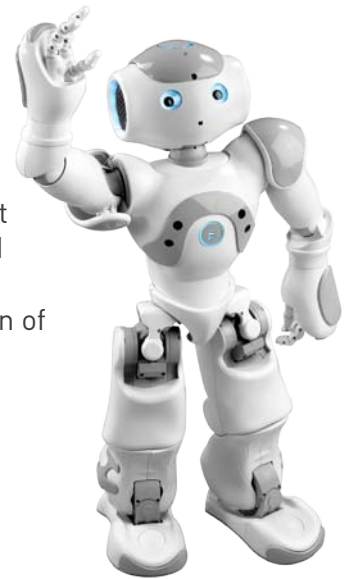


NAO, INTERACTIVE HUMANOID ROBOT

WHO IS NAO?

NAO is a humanoid robot that is 58cm tall and weighs 5kg developed by ALDEBARAN Robotics. NAO is an autonomous and interactive robot that is completely programmable. NAO is used today for research and education around the world in prestigious universities and research institutes. ALDEBARAN Robotics is working on a general public version of NAO for 2012.



WHAT CAN NAO DO?

NAO has the ability to see, hear, speak, feel and communicate. Using the latest and most innovative technology, NAO is a unique combination of hardware and software designed, developed and built by Aldebaran Robotics. NAO's special characteristics of fluid movements, the ability to sense and avoid obstacles and the capability to be fully programmed using Choregraphe, a one of kind software developed by Aldebaran, places NAO in a league of its own. Platform agnostic, NAO can be programmed and controlled using Linux, Windows or Mac OS and comes with complete software and documentation.

WHAT ARE THE USES OF NAO?

NAO is the most widely-used humanoid robot for academic purposes worldwide. Over 1000 NAO's have been sold to 300 universities and laboratories to serve as a tool for research in over 30 countries.

Universities using NAO include Harvard and Brown University in the U.S., University of Wales in the U.K, Universitat of Freiburg in Germany, Zhejiang University and Tongji University in China.

Because of NAO's versatility, it can be used for simple visual programs or to elaborate embedded modules since it enables the user to explore a large variety of subjects, whatever the level of programming complexity and experience desired.

Universities use NAO for research on robotics, artificial intelligence, and computer science but also in other areas ranging from sociology to medical care.

The choice of an interactive and fully programmable humanoid form are the determining factors which explain NAO's continued success as seen by the wide range of projects and applications for both research and education. From diverse fields including studies on motor skills, balance, grasping of objects or research on vision, language and man machine interaction (MMI) or man robot interaction, NAO is the leading robotics platform used today. New applications for NAO are constantly being discovered in areas beyond robotics including treating children with autism or as an educational platform to support teachers in university or secondary schools with some examples below (click text below to read each article):

- **Children and robots**
- **Children with autism - University of Notre Dame & Professor Joshua Diehl**
- **Children in hospitals and robots - Project Aliz-e**
- **Robots and the elderly**
- **Robot ethics**

NAO IN EDUCATION

Today, Aldebaran Robotics is embarking on a new adventure. We now offer a wide range of products for higher education. Our ambition is to encourage students to embrace scientific studies and to create new jobs based on our unique and innovative tool.

Educational robots are fun, motivating, challenging and visionary. NAO, as a hands on way of teaching and learning, is helping pave the way for the future of education.



NAO is the first versatile and programmable humanoid robot that is used as a standard platform for STEM students (science, technology, engineering, and mathematics). Its user-friendly programming environment, used by programming beginners and experts alike, includes the visual programming software Choregraphe and a 3D simulator along with numerous APIs. A step-by-step guide helps both students and teachers to easily master NAO, thus rapidly energizing science and engineering classes.

NAO enables teachers to combine complicated mathematical, physical, programming theory with fun and interactivity - a great tool for learning by doing.

NAO FOR EDUCATION

We like your project, together let's make it happen! ALDEBARAN Robotics aims to encourage universities and schools provide their classes with robots.

ALDEBARAN Robotics has decided to invest in educational projects that embrace our vision. In exchange for visibility and an active role in the NAO Education Community, professors can benefit from special services and offers.

Any university or school with an ambitious project for using humanoid robots in their teaching is invited to apply. A program committee with members from the research community as well as ALDEBARAN Robotics will evaluate and select the applications that will benefit from the program.

The honored Professor Nakamura of Tokyo University has chosen NAO to teach computer science to his students and Tokyo University is the first to profit from this partnership and provide a class with 30 NAO robots. [read more here](#)

NAO NEWS / NAO IN THE WORLD

NAO at Shanghai Expo 2010

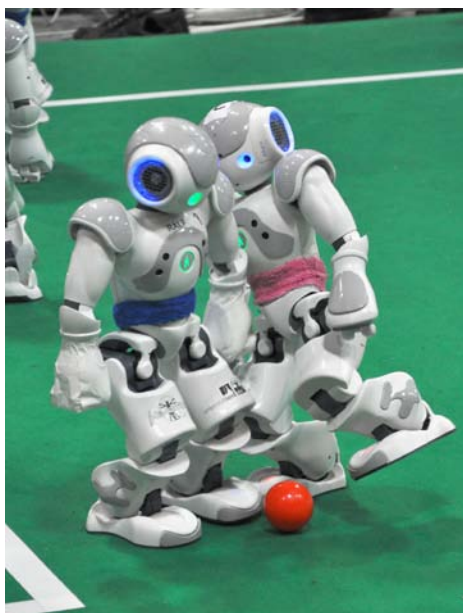
NAO was the ambassador of French advanced technology at the Shanghai Expo 2010. The robot was chosen by 2 French Pavilions to illustrate France's leadership and excellence in technological innovation.

"Considering the multitude of people massed in front of the performing NAOs, I believe we made the right choice when we decided to welcome the humanoids of ALDEBARAN Robotics, the much talked about SME. The 'small theatre of robots' brings a futuristic component to our sensual city's scenography, which is very much appreciated by our visitors," said José Frèches, President of COFRES SAS, the company in charge of the participation of France at the Shanghai World Expo.

On June 21, 2010 20 NAO robots made history at the France Pavilion by performing in public the first ever synchronized and autonomous 10 minute performance. The performance showcased NAO's range of smooth yet agile and rhythmic movements to a 3-part music compilation including the famous orchestral masterpiece Bolero by French composer Maurice Ravel. [Click here for the video](#)

NAO participates in Robocup, the World's Largest International Robotics Competition

In 1997 IBM Deep Blue defeated the human world champion in a chess match. As the next great achievement in the field of artificial intelligence and robotics, the RoboCup ([see the video](#)) has the goal of staging first match between autonomous humanoid robots and winners of the World Cup in the next fifty years. NAO has been selected as the official robotics platform for this annual event by the Robocup Interactional Committee. [Click here to read more](#)



NAO's FEATURES

NAO can listen. With 4 microphones and a voice recognition and analysis system, NAO can listen and understand. NAO also can localize sound in space.

NAO can speak. NAO can express itself by reading out any file stored locally in the storage space or captured from a web site or RSS flow. NAO can speak different languages.

NAO can see. NAO contains a set of algorithms to detect and recognize faces and shapes in order to recognize the person talking to it, find a ball, and ultimately much more complex objects.

NAO reacts to touch. NAO has sensors on the top of its head, divided into three sections. NAO can receive information through touch, for example pressing once to tell it to turn off or using this sensor as a series of buttons to trigger an associated action.

NAO is connected. NAO can communicate in several ways. Infrared senders/receivers placed in the eyes allow NAO to connect to the objects in its environment, serving as a remote control. NAO can also log on to a local network via Wi-Fi, making it easy to pilot and program him through a computer or any other object that has a Wi-Fi connection. Besides local communication, NAO can browse the Internet and interface with any website to send or retrieve data.

NAO stands upright and can avoid obstacles. NAO is equipped with an inertial central unit, composed of an accelerometer (3 axes) and a gyro meter (2 axes). The analysis of the data from the central unit also lets it know whether it is upright or lying on the back or front, so NAO can start kinematics to stand up. NAO is equipped with two pairs of ultra-sound senders/receivers on the torso to receive feedback on several echoes. As a result, NAO is aware of whether or not obstacles are close.

When two NAO meet they can talk to each other and work together. The user can choose to connect them directly in Wi-Fi, infrared or even body language. This facilitates research possibilities on collaborative work between robots and means that several NAOs can perform complex tasks such as geographic positioning or pooling analytical capacity.

NAO is completely programmable. Choregraphe, designed and developed by ALDEBARAN Robotics, is the programming software that allows NAO users to simply create and edit movements and interactive behaviors. Choregraphe accepts Urbi and Python language, so it can directly call C++ modules developed separately. Choregraphe is compatible with the simulators on the market such as Microsoft Robotics Studio and Webots from Cyberbotics, which allow the user to test behaviors in custom environments with one or more NAO.



FACT SHEET / OVERVIEW

Robotics will be the technological revolution of the 21st century just as the automobile was at the beginning of the 20th century, according to the United Nations. Changes in demographics are rapidly occurring as populations age. The ultimate human dream of creating an artificial companion to assist humans is no longer only science fiction but a realistic answer to the needs of an aging society.

Converging technologies such as voice and visual recognition are leading to a new generation of interactive devices. But, while robots are already part of the industrial sector today there are still some challenges before robots become veritable personal assistants.

To provide the robotics industry with the platform, software and tools to explore and develop the applications of tomorrow, ALDEBARAN Robotics designs, produces and commercializes autonomous humanoid robots.

Founded in 2005 by Bruno Maisonnier, with offices in France, China and the United States, ALDEBARAN Robotics has the ambitious goal of offering in the near future humanoid robots to the general public. Its first product, the NAO robot, is a 58-cm tall humanoid robot that is already a world-famous star in the Academic and humanoid robotics market. [\(Click to see video\)](#)

Since 2008, ALDEBARAN Robotics has been providing NAO robots to 300 of the most prestigious universities in the world: Stanford Research Institute, Harvard, Supelec, Ecole des Arts et Metiers, KAIST in Korea, Tsukuba University in Japan...

NAO comes with different programming interfaces that are adapted to its user's level. It answers the needs of universities and laboratories in very diverse topics: computer sciences, Artificial Intelligence, automation ... NAO is currently in use in 30 different countries, and 85% of our sales are made outside France.

ALDEBARAN Robotics brings together more than 100 persons, including 45 engineers and PhDs that are involved in the development and production of the robot.

For testimonials, please visit www.youtube.com/user/ALDEBARANRobotics

More pictures and video at ftp3.aldebaran-robotics.com

Login: aldeb-mkt-press

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