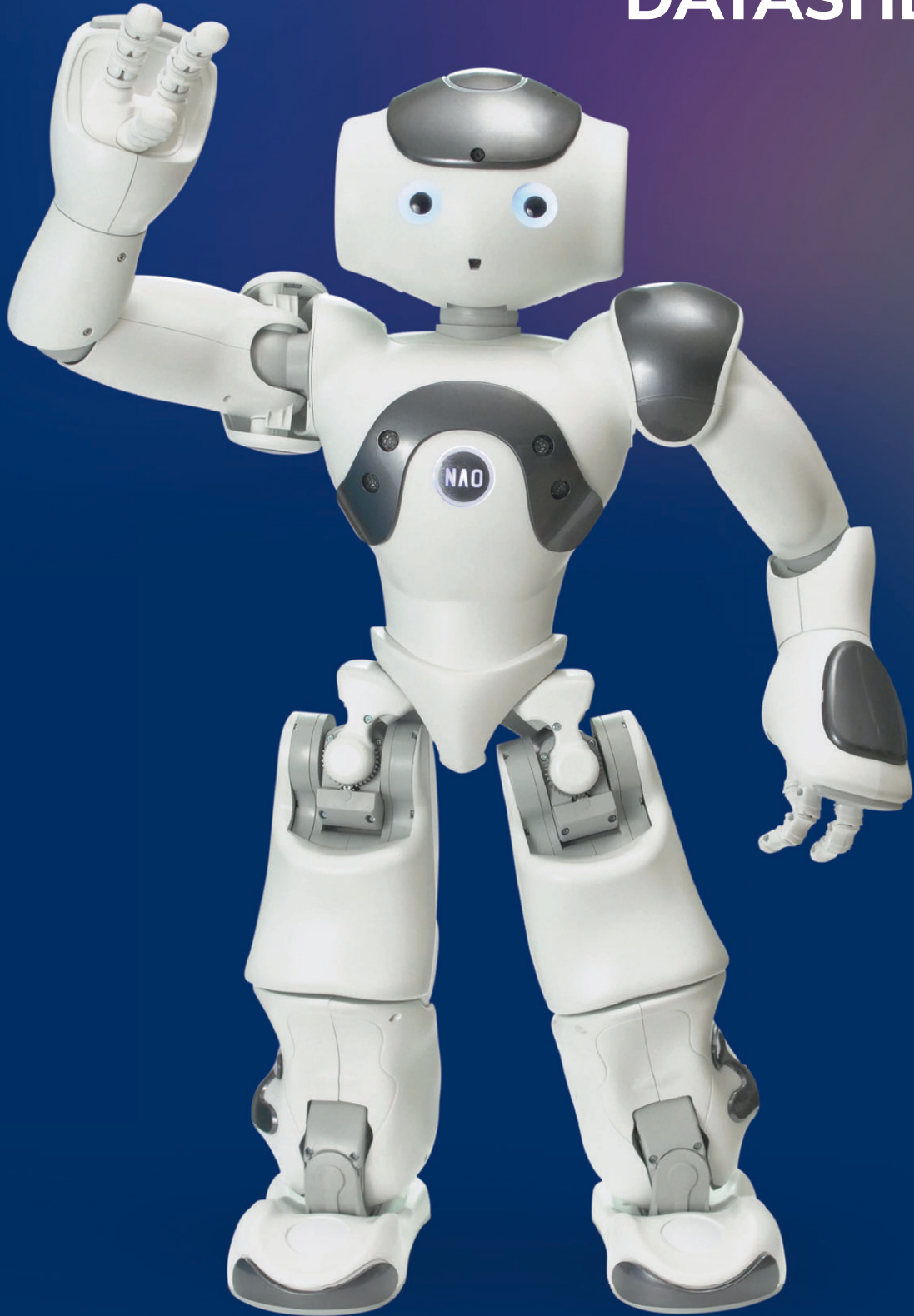


# NAO<sup>6</sup>

## DATASHEET



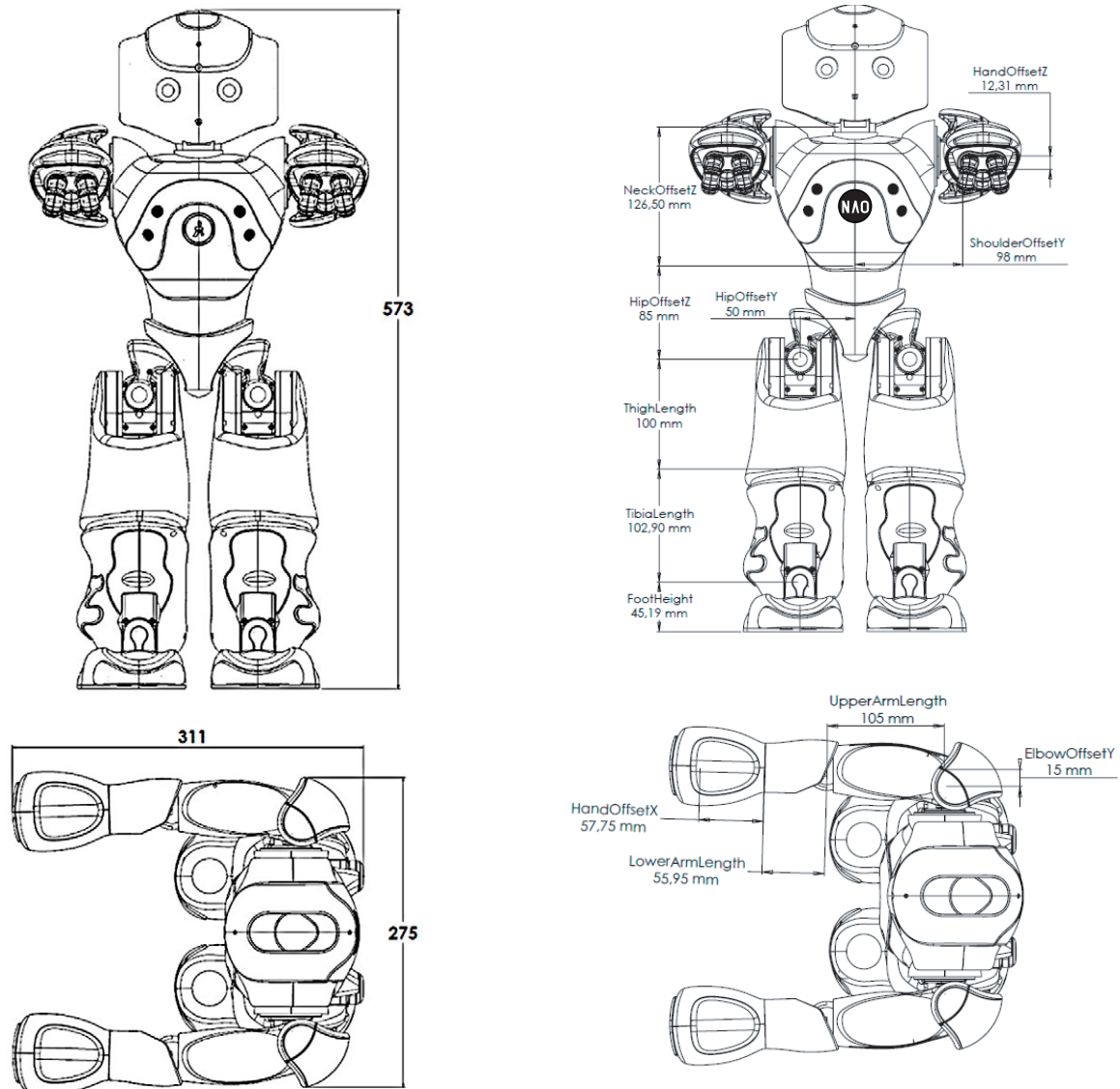
# NAO<sup>6</sup>

MODEL: H25600

## PHYSICAL CHARACTERISTICS

### GENERAL

Robot size (HxDxW)	574x311x275 mm / 22.6x12.2x10.8 in
Robot weight	5.48 kg / 12.08 lbs



# NAO<sup>6</sup>

## POWER

### ROBOT

Input	24.8 V <sub>DC</sub> / 2.0 A Typ.
Working temperature	-5°C to 35°C 23°F to 95°F
IP rating	IPX0

### BATTERY

Type	Lithium-Ion
Nominal voltage/capacity	21.6 V / 2.9 Ah
Max charge voltage	25.2 V
Recommended charge current	1.8 A
Max charge / discharge current	2.1 A / 2.0 A
Energy	62.5 Wh
Working temperature	-20°C to 50°C -4°F to 122°F
Charging duration	90 min
Run time	60 min (Active use) 90 min (Normal use)

### CHARGER

	ADP-50ER	ADP-50MR
Input	100 to 240 V <sub>AC</sub> / 50-60 HZ / 1.2 A max	
Output	25.2 V <sub>DC</sub> / 2 A	
Casing dimensions	135 x 62 x 34 mm	155 x 67 x 37 mm
DC cable length	1.80 m	
Weight	400 g	500 g
Working temperature	-5 °C to 40 °C / 23 °F to 104 °F	

## BRAIN SYSTEM

### MOTHER BOARD

CPU	CPU processor	ATOM E3845
	Cache memory	2 MB
	Clock speed	1.91 GHz
RAM	4GB DDR3	
Flash memory	32GB eMMC	

## TRANSPORTATION

Carton Size (HxDxW)	29 x 36 x 57 cm 11.5 x 14.2 x 22.4 in
Carton Weight	8.5 kg / 17.6 lbs
HS Code	8471 41 00
Country of Origin	China

## CERTIFICATION

List of certified countries	Europe, China, USA, Canada, UK, Japan, Taiwan, Singapore, Australia & NZ, Israel, Qatar, Saudi Arabia, South Africa, Philippines
Main markings	CE, FCC, NRTL (cBvUs), Giteki, PSE, RCM, IMDA, NCC, BSMI, ...
Safety standards	IEC 62368-1:2014
EMC Class	Class A
Transportation	UN38.3, MSDS
EU Declaration of Conformity	<a href="https://www.maxtronics.com/en/conformity">https://www.maxtronics.com/en/conformity</a>

## CONNECTIVITY

### CONNECTION

Ethernet	1xRJ45 - 10/100/1000 BASE T
WIFI	IEEE 802.11a/b/g/n

### SOFTWARE

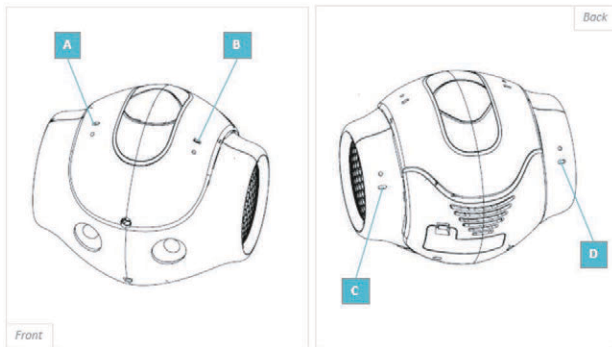
Open Nao	Embedded GNU/Linux Distribution based on Yocto
Architecture	x86
Programming	Embedded: C++ / Python

# NAO<sup>6</sup>

## HUMAN INTERACTION

### AUDIO

Loud Speakers	Left & Right	
	Diameter	40 mm
	Impedance	4 Ω
	Audio power	87 dB +/- 3 dB
	Freq range	up to ~20 kHz
Microphones	Input	2 W
	×4 omnidirectional on the head (A, B, C, D)	
	Sensitivity	-12dBV/PA @1KHZ
	Frequency range	100HZ to 10KHZ



### LEDS

Placement	Quantity	Description
Tactile Head	12	16 White levels
Eyes	2×8	RGB FullColor
Ears	2×10	16 Blue levels
Chest button	1	RGB FullColor
Feet	2×1	RGB FullColor

### 2D CAMERA - FRAMERATES

	Top Camera	Bottom Camera
Resolution		
320×240 px	@15, 30 fps	@15, 30 fps
640×480 px	@15, 30 fps	@15, 30 fps
1280×960 px	@15, 30 fps	@10, 15 fps
1920×1080 px	@15, 30 fps	-
2560×1920 px	@15 fps	-

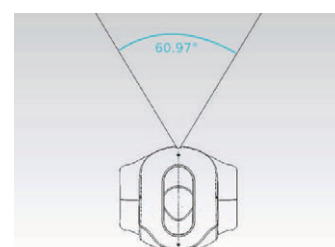
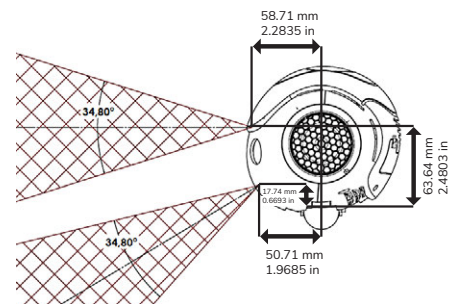
Note: The rate of the video stream will depend on the network and the video resolution chosen. All frame rates depend on the CPU usage. Values are measured with a CPU fully dedicated to image gathering.

### LANGUAGES

Text to speech	Arabic, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Italian, & Automatic
speech	Japanese, Korean, Standard Mandarin, Taiwanese Mandarin, Norwegian,
Recognition	Polish, European Portuguese, Brazilian Portuguese, Spanish, Swedish, Russian, Turkish.

### 2D CAMERAS

Cameras	2 front of head	
Sensor model	OV5640	
Sensor type	SoC - CMOS Image Sensor	
Imaging array	Resolution	5 MP
	Size	1/4 in
	Active Pixels (H×V)	2592 x 1944
Sensitivity	Pixel size	1.4 x 1.4 μm
	Dynamic range	68 dB @8x gain
	Signal/Noise ratio (max)	36 dB
	Responsivity	600 mV/lux-sec
	Camera output	640 x 480 @30 fps
Output	Data Format	YUY & RGB
	Shutter type	Rolling Shutter/ frame exposure
View	Field of view	67.4° DFOV (56.3° HFOV, 43.7° VFOV)
	Focus range	10 cm ~ ∞ ≈ 4 in - ∞
	Focus type	Auto focus



# NAO<sup>6</sup>

## ENVIRONMENT SENSORS

### INERTIAL UNIT

Gyrometer	1	
Axis		3
Precision		5%
Angular speed		500° /s approx.

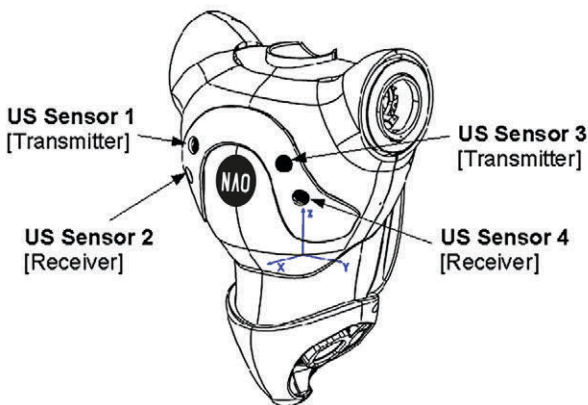
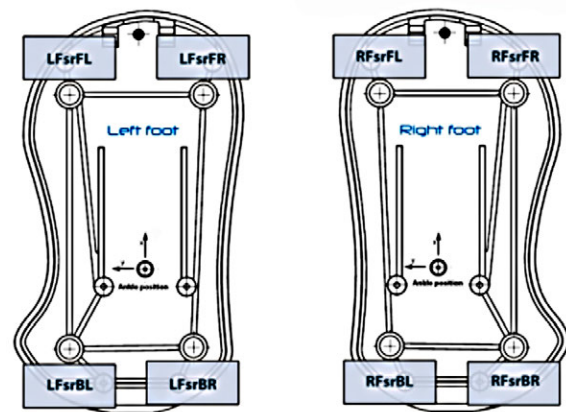
IMU	1	
Axis		3
Precision		10%
Nominal acceleration		2 g approx.

### SONAR

Transmitters	2 on front
Receivers	2 on front
Frequency	40 kHz
Resolution	1 cm @50 cm
Detection Range	0.20 m to 0.80 m
Effective Cone	60°

### FORCE SENSITIVE RESISTORS (FSR)

Range	0 to 25 N
Location	4 in each foot
Sensitivity	40 g approx.



### BUTTONS & SENSORS

Chest Button	✓
Foot Bumper	✓
Tactile Head	✓
Tactile Hand	✓

# NAO<sup>6</sup>

## MOTION

### DEGREES OF FREEDOM

Head	2
Arm (in each)	5
Pelvis	1
Leg (in each)	5
Hand (in each)	1

### JOINT MOVEMENT ENCODERS

MRE (Magnetic Rotary Encoder)	36
	Using hall effect sensor technology
	Precision: 12 bits / 0.1°

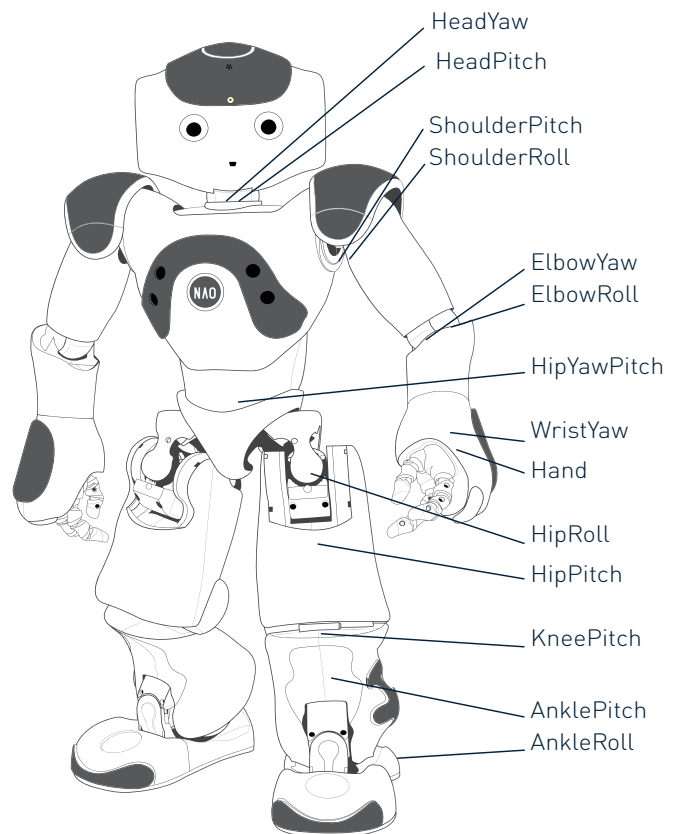
### MOTOR SPECIFICATIONS

Motor type Brush DC Coreless

### POSITION OF MOTORS

		Gear Ratio	Motor type
Head joints	HeadYaw	150.27	3
	HeadPitch	173.22	3
Arm joints	ShoulderPitch	150.27	4
	ShoulderRoll	173.22	3
	ElbowYaw	150.27	3
	ElbowRoll	173.22	3
Hand joints	WristYaw	50.61	2
	Hand/ Fingers	36.24	2
Leg joints	HipYawPitch	201.3	1
	HipRoll	201.3	1
	HipPitch	130.85	5
	KneePitch	130.85	5
	AnklePitch	130.85	5
	AnkleRoll	201.3	1

For details of type and gear ratio, see below.



### MOTOR TYPE

	Motor type 1	Motor type 2	Motor type 3	Motor type 4	Motor type 5
Make	22NT82213P	17N88208E	16GT83210E	DCX 16S	22NT Z20
No load speed (rpm)	8700 ±10%	8400 ±12%	10700 ±10%	11400 ±10%	8700 ±10%
Stall torque (mNm)	65 ±8%	9.4 ±8%	14.3 ±8%	22.4 ±10%	65 ±10%
Continuous torque (mNm)	17.8 max	4.9 max	6.2 max	2.6 max	17.8 max

# NAO<sup>6</sup>

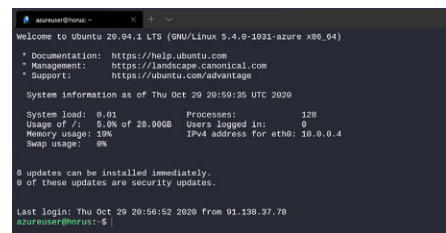
## TOOLS

### SDK



**Description** Software development kit for creating and controlling applications on NAO. Includes APIs and libraries (Python, C++), visual programming tools, simulation environment, and development documentation.

**Client** Windows, macOS, Linux

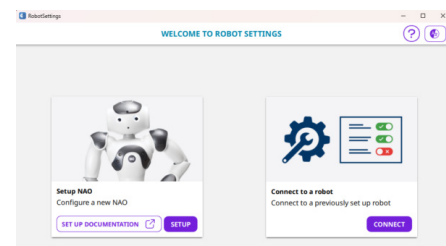


### Robot Setting



**Description** Desktop application for robot setup, configuration, and maintenance, including access to system information such as the installed NAOqi version.

**Client** Windows, macOS, Linux

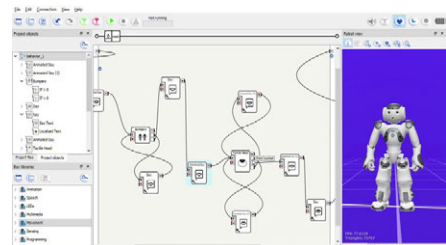


### Choregraphe



**Description** Desktop application for creating, testing, monitoring, and controlling NAO robot behaviors. Supports visual programming without coding, simulation, and integration of custom Python scripts.

**Client** Windows, macOS, Linux

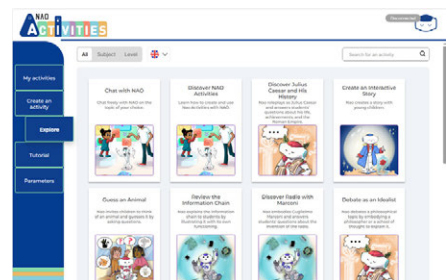


### NAO Activities



**Description** AI-powered platform for creating and running interactive educational, cognitive, and conversational activities on NAO without programming. Includes activity creation tools, QR code-based interactions, and a library of ready-to-use content for education and healthcare applications.

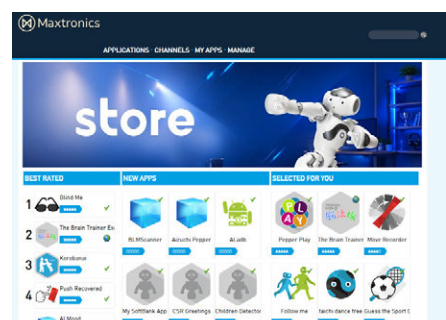
**Client** Web portal



### Store Apps

**Description** Application marketplace for discovering, downloading, and managing software, behaviors, and extensions for NAO, including educational, research, and interaction-focused applications.

**Client** Web portal





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