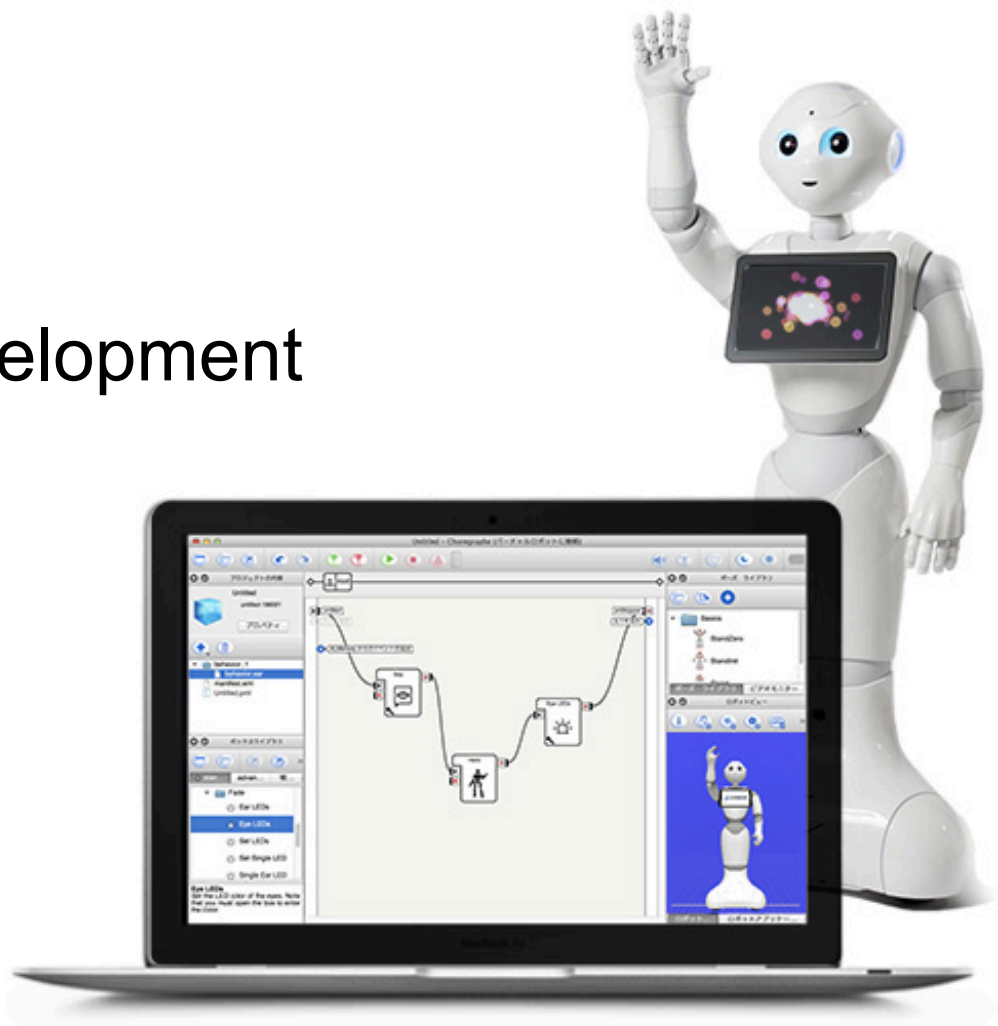


# Nao Application Development

## - Basic -



# Goal of this workshop

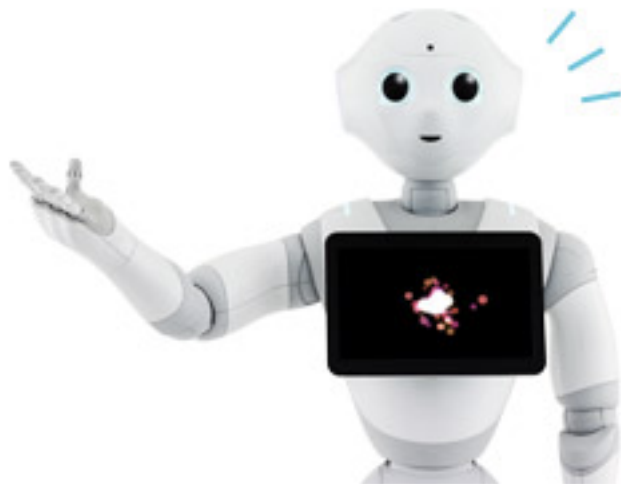
## Goal

- ✓ Develop easy robot application with Choregraphe

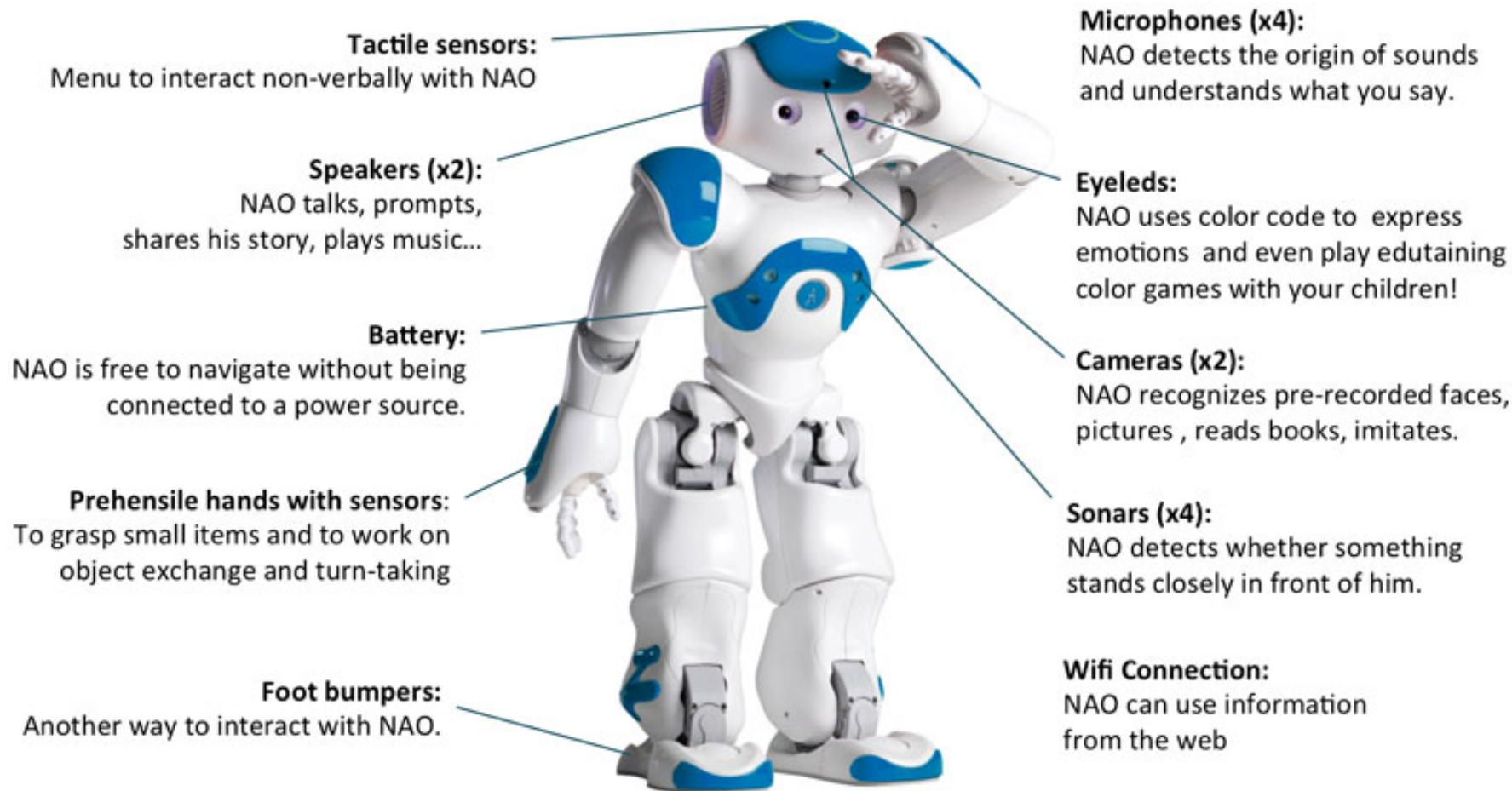
# Outline

- Pepper's hardware
- What is Choregraphe
- Basic robot application development
  - Say
  - Voice recognition and sensors

# Pepper's hardware

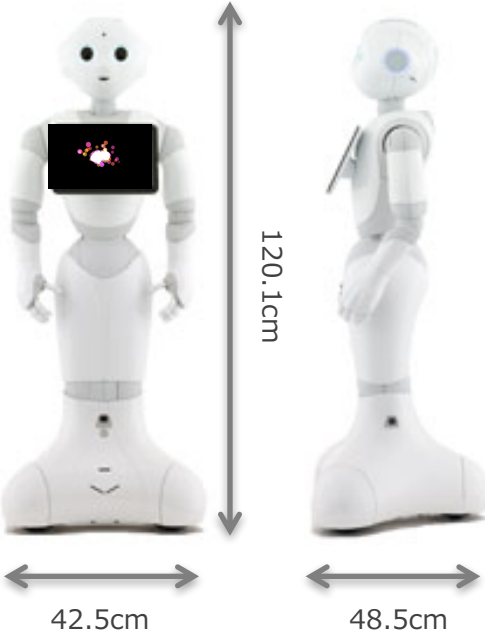


# Hardware Specification - Nao

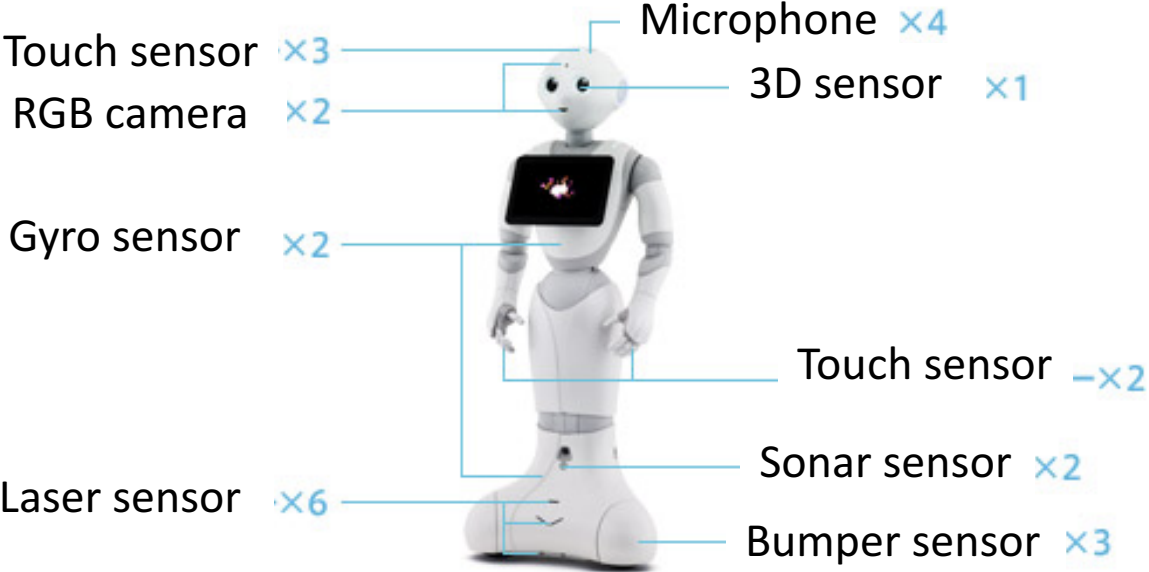


# Hardware Specification - Pepper

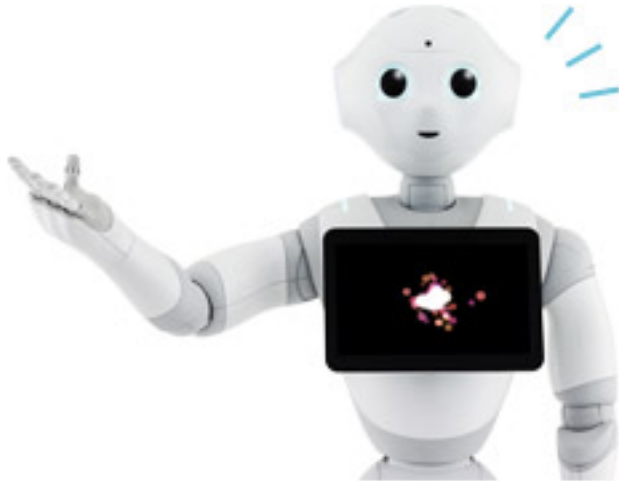
## Size



## Sensors



What is  
“Choregraphe”?



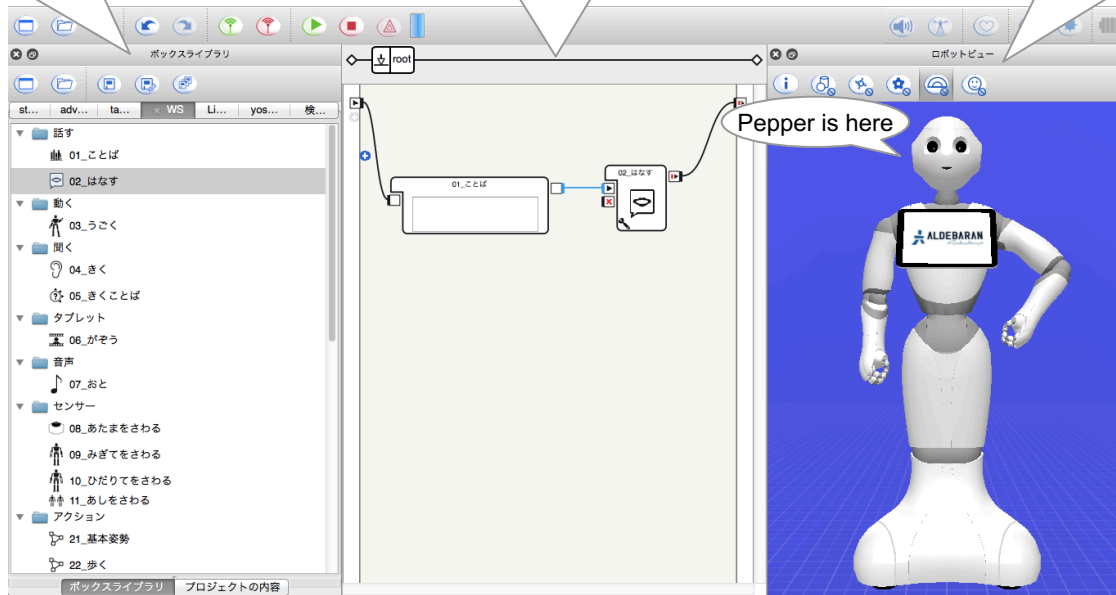
# What is “Choregraphe”?

- One of robot development tool that uses mainly “drag & drop”

Drag & Drop the Box

Connect between Boxes

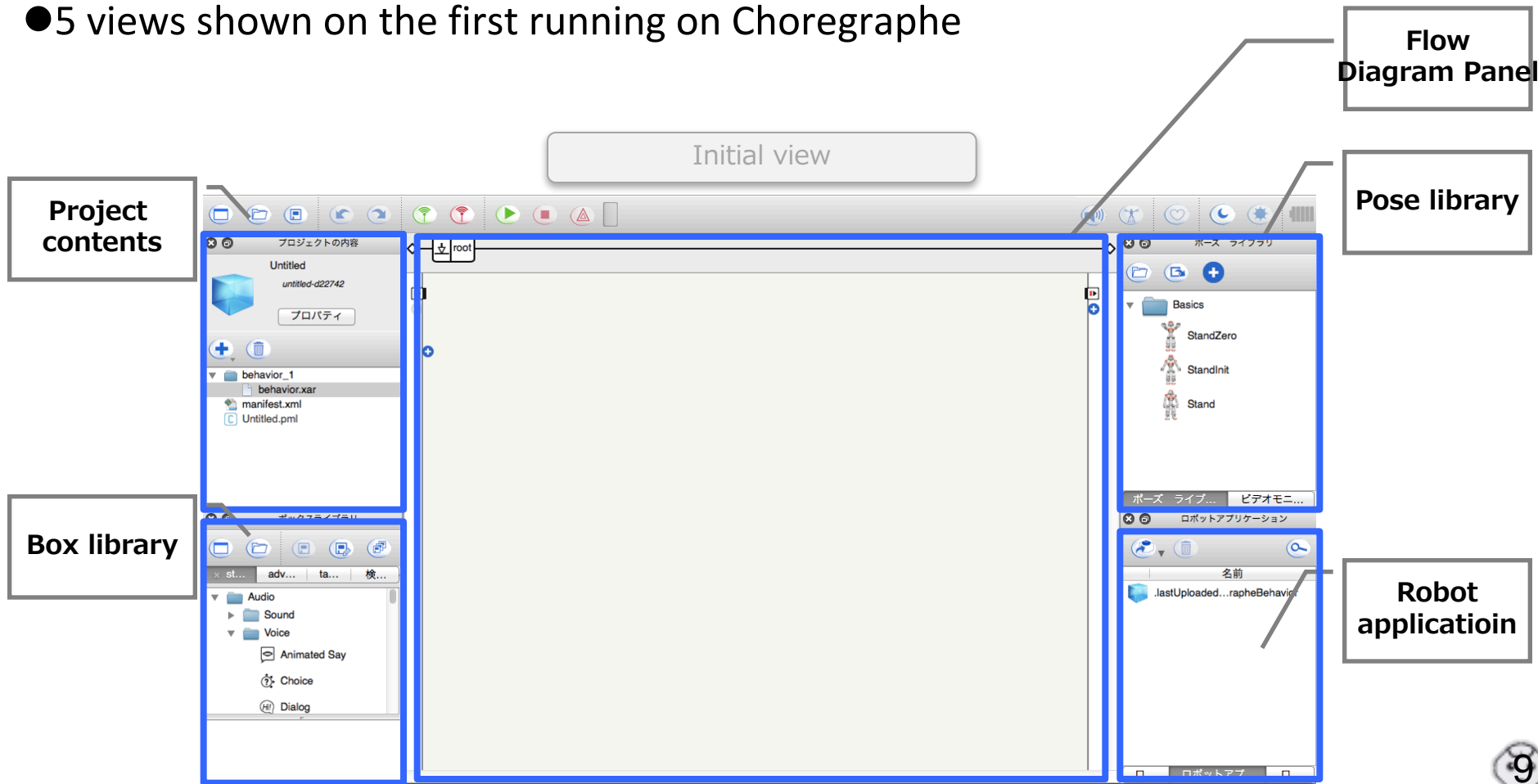
Pepper moves





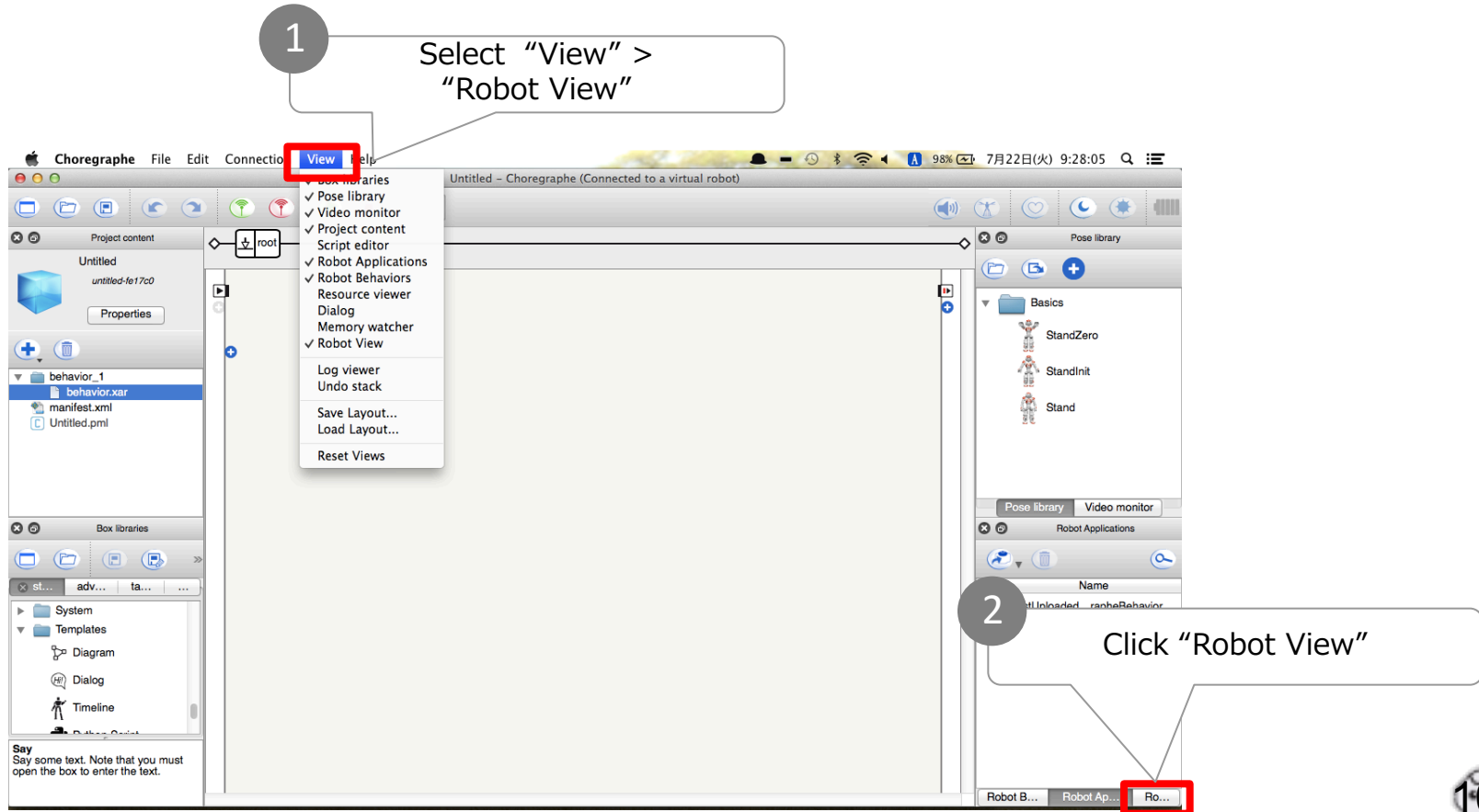
# View

- 5 views shown on the first running on Choregraphe



# View modification

- Display extra views needed for this workshop



# Connect to the robot

1 Click "Connect" button

2 Select your Pepper then click the "Select" button

3 (If no robot seen on the display,) Enter IP address, then click the "Select" button

The interface shows a Finder window with a sidebar containing 'プロジェクトの内容' (Project Content) and 'ボックスライブラリ' (Box Library). The main area displays a 'Connect to...' dialog box with a table of robots and a 'Select' button.

Status	Name	IP
★	shn9 (Conn	10.1.122.118
★	Akihito-no-	10.1.122.67
★	gunji-no-Me	10.1.122.81
★	ppn1	10.1.122.47
★	ppn7 cal.	10.1.122.64
★	ppn8.local.	10.1.122.112

The 'Connect to...' dialog box also includes a 'Use fixed port' checkbox (checked) with the value '9559' and a 'Use fixed IP/hostname' checkbox (unchecked) with the value '10.1.122.118'. The 'Select' button is highlighted in blue.

# Confirmation of Robot name and IP address

Push the chest button, then Pepper talks

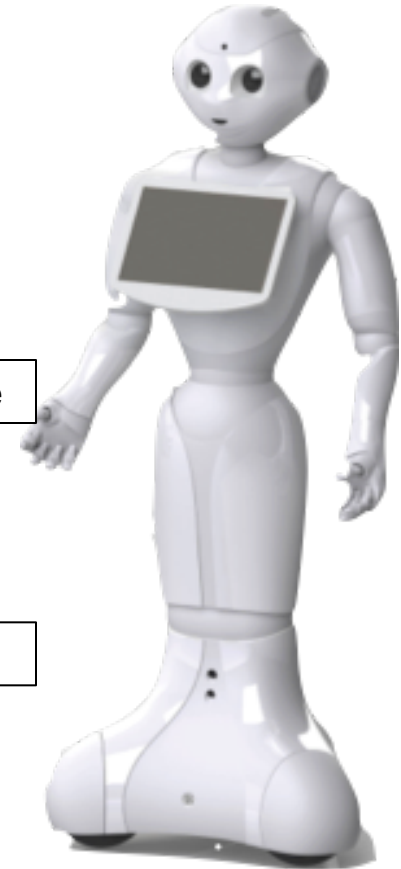


Hello, I am "Pepper 51"

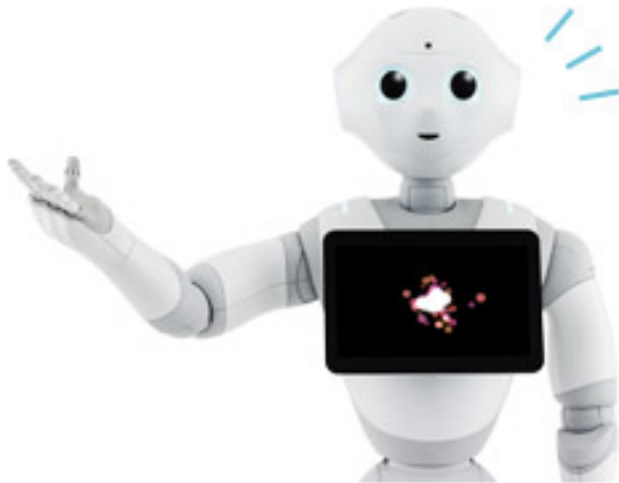
My internet address is "10.1.122.165"

Robot name

IP address



Say something



# “Say” 1/3

The screenshot displays the Choregraphe application window. The top menu bar includes 'Choregraphe', 'File', 'Edit', 'Connection', 'View', and 'Help'. The title bar indicates 'Untitled - Choregraphe (Connected to 10.1.122.118)'. The interface is divided into several panels:

- Project content:** Shows a tree structure with 'root' and 'behavior\_1' (containing 'behavior.xar', 'manifest.xml', and 'Untitled.pml').
- Pose library:** Lists 'StandZero', 'StandInit', and 'Stand'.
- Robot View:** Displays a 3D model of a robot.
- Log viewer:** Shows system logs, including messages from 'ALDiagnosis', 'audio.TextToSpeechEngine', and 'ALTextToSpeechAiTalk'.

Three numbered callouts provide instructions:

- 1 Audio > Voice > Say Drag & Drop:** Points to the 'Say' block in the 'behavior\_1' tree.
- 2 Connect from ► to ► on Say by drag & drop:** Points to the connection line between the 'Say' block and the 'root' node.
- 3 Display details of Say by double click:** Points to the 'Say' block icon.

The 'Say' block is highlighted with a red box. Below the 'Say' block, a text box contains the following text:

**Say**  
Say some text. Note that you must open the box to enter the text.

# “Say” 2/3

7 Play by clicking “Play”

6 Click “root” to go back one level

4 Select “English”

5 Input text Pepper says

Localized Text

Japanese

コマネチ

Say Text

Project content

root

Say

Pose library

StandZero

StandInit

Stand

Pose library Video monitor

Robot View

Dialog

Robot: コマネチ

Robot: コマネチ

Robot: コマネチ

Robot: コマネチ

Robot: あなた、ぼくの名前、知っていますか？

Robot: よく聞こえなかったので、もう一度、言ってくれますか？

Robot: コマネチ

Log viewer

[INFO] ALDiagnosis.LogDiagnosisPublisher:publish:0 [Head/Touch/Rear][Sensor] [Head/Touch/Rear/BlockedTestSuite][SensorBlocked] Success.

[INFO] ALDiagnosis.LogDiagnosisPublisher:publish:0 [LHand/Touch/Back][Sensor] [LHand/Touch/Back/BlockedTestSuite][SensorBlocked] Success.

[INFO] ALDiagnosis.LogDiagnosisPublisher:publish:0 [RHand/Touch/Back][Sensor] [RHand/Touch/Back/BlockedTestSuite][SensorBlocked] Success.

[INFO] ALDiagnosis : \_wakeUpFinishedCallback:0 Tests registered at wakeUp finished.

[INFO] ALTextToSpeechAiTalk :xConvertTags:0 reset all tags:

[INFO] audio.TextToSpeechEngineAiTalk :xStartSynthesizer:0 Start synthesis of <&Pit ABSLEVEL=1&> <&Spd ABSPEED=1&> <&Pit ABSLEVEL=1&> コマネチ

[ERROR] OKAOFaceRecognition :forgetFace:0 User "223992" does not exist in database

Show all logs

Log Level: Info

Say

Say some text. Note that you must open the box to enter the text.

Animated Say

Choice

Dialog

Say

# “Say” 3/3

The screenshot shows the Choregraphe software interface. The main workspace displays a behavior tree with a 'Say' block. A red box highlights the 'parameter' button on the 'Say' block, with a callout labeled '8' that says 'Click parameter button'. A dialog box titled 'Set parameters of Say' is open, showing sliders for 'Voice shaping (%)' and 'Speed (%)', both set to 100. A red box highlights the dialog, with a callout labeled '9' that says 'Modify voice shaping and speed'. The dialog also has a checkbox for 'Auto-update parameters on robot' (checked), a 'Reset to default' button, and 'Cancel' and 'OK' buttons. The 'Box libraries' panel on the left shows the 'Say' block. The 'Log viewer' at the bottom shows system logs, including a warning about a user not existing in the database. The 'Video monitor' on the right shows a 3D model of a robot.

Choregraphe File Edit Connection View Help

Untitled - Choregraphe (Connected to 10.1.122.118)

Project content

Untitled

untitled-e41c55

Properties

behavior\_1

behavior.xar

manifest.xml

Untitled.pml

Box libraries

Animated Say

Choice

Dialog

Say

Say

Say some text. Note that you must open the box to enter the text.

Log viewer

[INFO] ALDiagnosis.LogDiagnosisPublisher:publish:0 [Head/Touch/Rear][Sensor] [Head/Touch/Rear/BlockedTestSuite][SensorBlocked] Success.

[INFO] ALDiagnosis.LogDiagnosisPublisher:publish:0 [LHand/Touch/Back][Sensor] [LHand/Touch/Back/BlockedTestSuite][SensorBlocked] Success.

[INFO] ALDiagnosis.LogDiagnosisPublisher:publish:0 [RHand/Touch/Back][Sensor] [RHand/Touch/Back/BlockedTestSuite][SensorBlocked] Success.

[INFO] ALDiagnosis : \_wakeUpFinishedCallBack:0 Tests registered at wakeUp finished.

[INFO] ALTextToSpeechAiTalk :xConvertTags:0 reset all tags:

[INFO] audio.TextToSpeechEngineAiTalk :xStartSynthesizer:0 Start synthesis of <&Pit ABSLEVEL=1&> <&Spd ABSPEED=1&> <&Pit ABSLEVEL=1&> コマネチ

[ERROR] OKAOFaceRecognition :forgetFace:0 User "223992" does not exist in database

✓ Show all logs

Log Level: Info

Set parameters of Say

Parameters

Voice shaping (%) 100

Speed (%) 100

✓ Auto-update parameters on robot

Reset to default

Cancel OK

Modify voice shaping and speed

Pose library

Video monitor

Robot View

Dialog

Robot: コマネチ

Robot: コマネチ

Robot: コマネチ

Robot: コマネチ

Robot: あなた、ぼくの名前、知っていますか？

Robot: よく聞こえなかったので、もう一度、言ってくれますか？

Robot: コマネチ



# Voice recognition and sensors



# Interactive application with "Speech Reco."

1 Audio > Voice > Speech Reco.  
Speech Reco.

2 Click parameter button

3 Input words (use ; to separate each word)  
例 : hello;good afternoon

4 Flow Control > Switch case  
Switch case  
Then, connect middle output of Speech Reco.

5 Input words that are in Switch case (need "")

6 Add Say corresponding to each word

Parameters  
Word list: こんにちは;こんばんわ  
Confidence threshold (%): 30

Log viewer  
Log Level: Info

Dialog  
Robot: 朝の挨拶ですね  
Human: こんにちは (63.01%)  
Robot: 夜の挨拶ですね  
Human: こんにちは (47.05%)  
Robot: 朝の挨拶ですね

# Interactive application with touch sensors

1 Sensing > Tactile Head  
Tactile head

2 Connect from third output of Tactile Head to input of Say

touch  
touch-71f200

Tactile Head

Tactile L.Hand

Tactile R.Hand

Box libraries

- Choice
- Dialog
- Say
- Set Language

Log viewer

```
[INFO] ALTextToSpeechAiTalk :xConvertTags:0 reset all tags:  
[INFO] audio.TextToSpeechEngineAiTalk :xStartSynthesizer:0 Start synthesis of  
<&Pit ABSLEVEL=1&> <&Spd ABSSPEED=1&> <&Pit ABSLEVEL=1&> みぎ  
あし  
[INFO] ALTextToSpeechAiTalk :xConvertTags:0 reset all tags:  
[INFO] audio.TextToSpeechEngineAiTalk :xStartSynthesizer:0 Start synthesis of  
<&Pit ABSLEVEL=1&> <&Spd ABSSPEED=1&> <&Pit ABSLEVEL=1&> みぎ  
あし
```

✓ Show all logs Log Level: Info

Pose library

- StandZero
- StandInit
- Stand

Video monitor

Robot View

Dialog

Robot: みぎ  
Robot: みぎて  
Robot: ひだりて  
Robot: ひだりあし  
Robot: みぎあし  
Robot: みぎあし  
Robot: みぎあし