Programming for Basic Artificial Intelligence using NAO Robots and Choregraphe

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Introduction

NAO is the first humanoid robot created by Aldebaran Robotics in 2005. NAO has many built-in sensors to help closely mimic human behavior. Now in its 6th generation, NAO has become recognized as the standard robot used for education and research purposes.

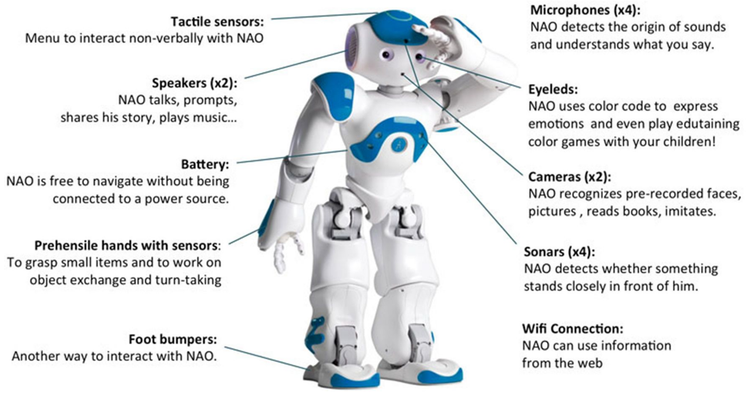

Figure 1: NAO robot

Methods

1) Setting up NAO:

1. Unpack and turn ON NAO
   to prepare NAO for his setup.
2. Get Robot settings
   to install setting tools on your computer.
3. Configure NAO
   to configure NAO’s timezone, password, content, etc.

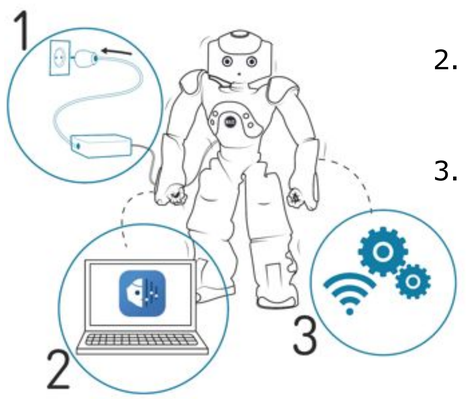

Figure 2: Initial setup steps

Methods - continued

2) Install Robot Settings and connect to WiFi:

Robot Settings is a desktop application that allowed us to perform the robot’s initial configuration. NAO must be connected to the same network as your computer.

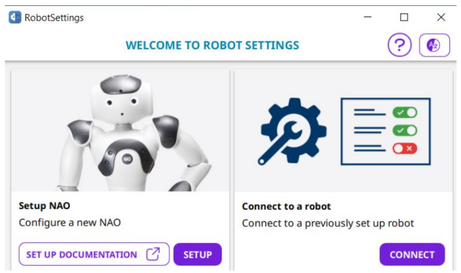

Figure 3: Robot Settings

3) Install Choregraphe

Two ways to program NAO using Choregraphe:
1) Drag and drop actions from box libraries on the left into the middle window, creating a flow diagram.

2) Create your own boxes in Choregraphe and write your code in any of these programming languages: Python, Java, C++, MATHLAB, or LabVIEW.

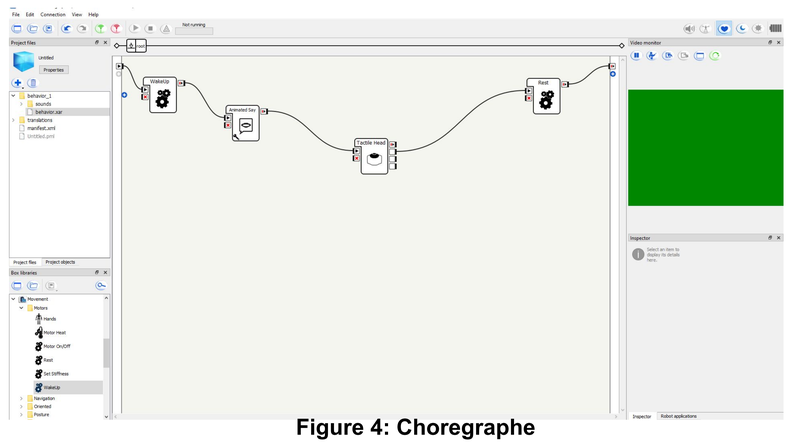

Figure 4: Choregraphe

Results

Jesse: Tried to make robot be a dance/fitness instructor

Juvy-Ann: Attempted to program robot to focus on simple movements and conversation using box libraries

Lisa: Explore NAO’s movements by creating a workout robot

Lizyl: Program NAO Drink Suggestion Project

Challenges

- Connecting to KCC’s WiFi
- Choregraphe is not compatible with newer Macs
- Face recognition - did not respond to us because of our mask; switched to plastic face shields
- Bright lighting in the classroom
- Voice recognition - NAO needs to recognize the user’s answers; issues with accents, intonation of your words, speaking faster/slower, etc.
- Potential bias toward male voices

Conclusion

As it turns out, programming an entire brain from scratch is challenging. Everything that is done and achieved is by trial and error. Everything that the robot knows and how it interacts must be coded in. We found it easier to ask non open ended questions for a much lesser chance of error. More time would be needed to explore such a vast field.

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