

Showcasing Applications of Computer Science with Robotics Using the NAO Robot

Bryan Holguin Herrera

Advisor: Nic Herndon, PhD

Goals

The purpose of this project is two-fold:

- 1. Document the usage of the NAO robot to facilitate future use by others.
- 2. Create applications and programs for the NAO robot in order to use it as an aide in presentations.
 - These applications provide a functional interactive experience that could be used to drive interest in the Computer Science field.

Methods

- 1. I created a website using ReadTheDocs and used my personal experience with the NAO robot to condense and clarify existing documentation, as well as provide new information that may be needed in the future.
- I created applications using SoftBank Robotics' own software, called Choregraphe. This process was also documented on the ReadTheDocs website, and the apps were shared via GitLab.

Final Products

- The documentation is available at the following website: https://naobasic.readthedocs.io/en/lates
- The GitLab repository that contains the code for the ReadTheDocs and the application files is available at:

https://gitlab.com/dsl_pub/nao_basic

Creating Applications with Choreographe



- I used Choregraphe software, shown above, to create applications for the NAO robot.
- Choregraphe uses boxes and links to simplify the application creation process as much as possible.
- This lowers the barrier of entry into programming the NAO robot, making it a <u>valuable teaching tool</u>.



- One such application is shown above.
- This app, called "Party time," has two stages controlled by the boxes.
- The first box instructs NAO to say, "It's party time."
- The second box executes a disco dance.
- The lines connecting both boxes indicate the flow of the program, something that is often difficult to grasp when learning to code.



Future Application to Outreach Events

- Showcasing the NAO robot to children, students, and teachers can generate interest in Computer Science by showing that code can have a visible and tactile result.
- This, combined with the interactive experience of talking to the NAO robot to trigger certain applications, demonstrates what Computer Science can achieve.



ReadTheDocs



Gitlab