



Developing an experimental platform for Human Robot Interaction based on human motions

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TO-DO List

- Improvement of Pose estimation of marker
 - Removing outliers when the change in angle is large
 - Averaging the pose to find smooth estimate
 - Particle Filter approach using Bayesian filter library
 - Was not able to make it work as expected. Have to spend more time on it.
- Collaborate with Mr. Vincent Berenz to use TDM framework for behavior execution
 - Made initial tests of Nao walking towards a virtual target.
 - The TDM module gets localization information in real time from the server however as the robot approaches the distance increases instead of decreasing.
 - Will get things clarified during the meeting in this week
- Improve the data structure that contains the description of the world
 - Added required information for managing the gestures of all the active humans in the field of view.
 - Additionally added information about available behavior modules and motion modules.

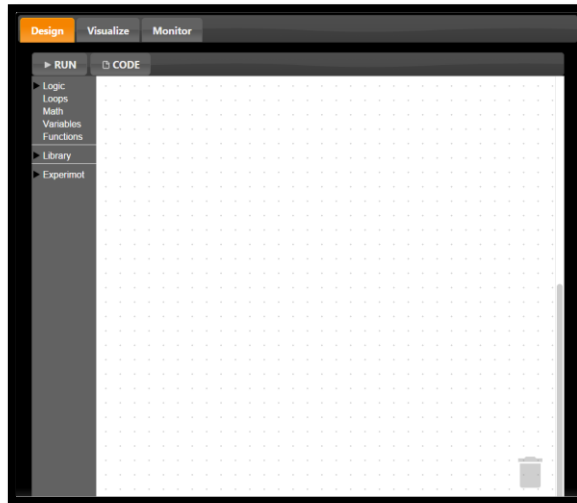


TO-DO List

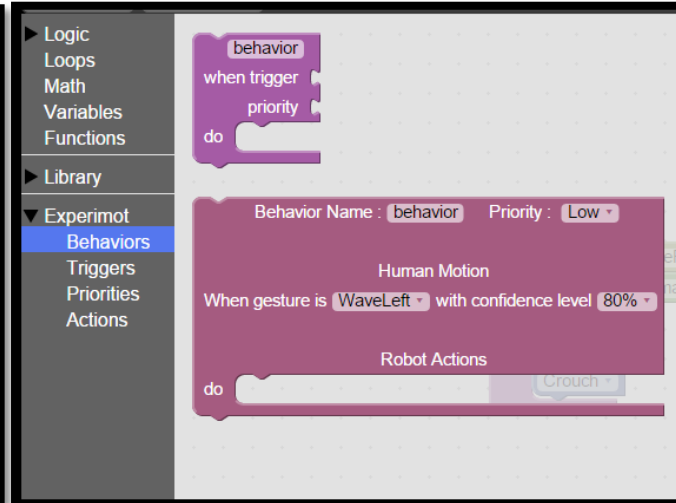
- Natural Language representation and translation of high level representation into gesture triggers and robot behaviors
 - Tried integrating Stanford Natural Language Processing Library
 - It is good. However when given an empty paper, the user can write whatever they want and converting them into a meaningful interaction scenario is very tough
 - Checked out various visual programming methods for novice programmers like Scratch, TouchDevelop, Google Blockly etc.,
 - Google Blockly looked promising since they offer the SDK to make custom blocks and code generation capability
- Develop an easy to use interface for designing behaviors using high level language
 - Web interface developed using a bunch of client side javascript libraries including Blockly and Threejs 3D viewer
- Designing concrete scenarios and evaluate (Receptionist, Something based on IMU?)
 - To be done!



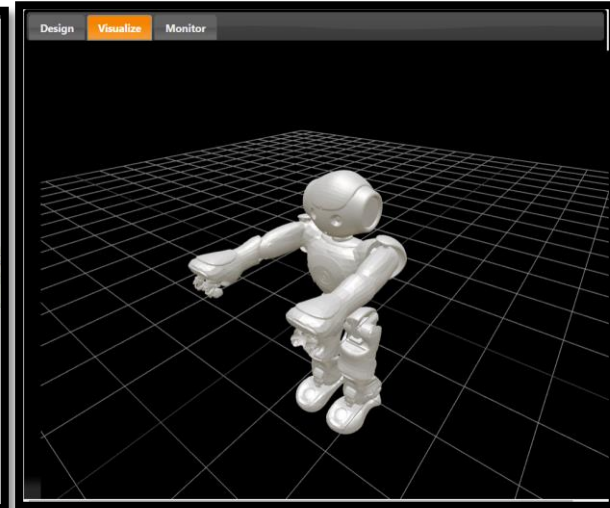
Platform – User Interface concept



Designer



Toolbox

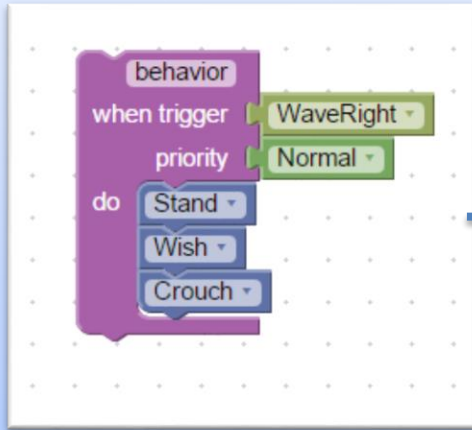


Visualize



Behaviors: Design-Generate-Execute workflow

Experimot Web Interface



1. Behavior Creation

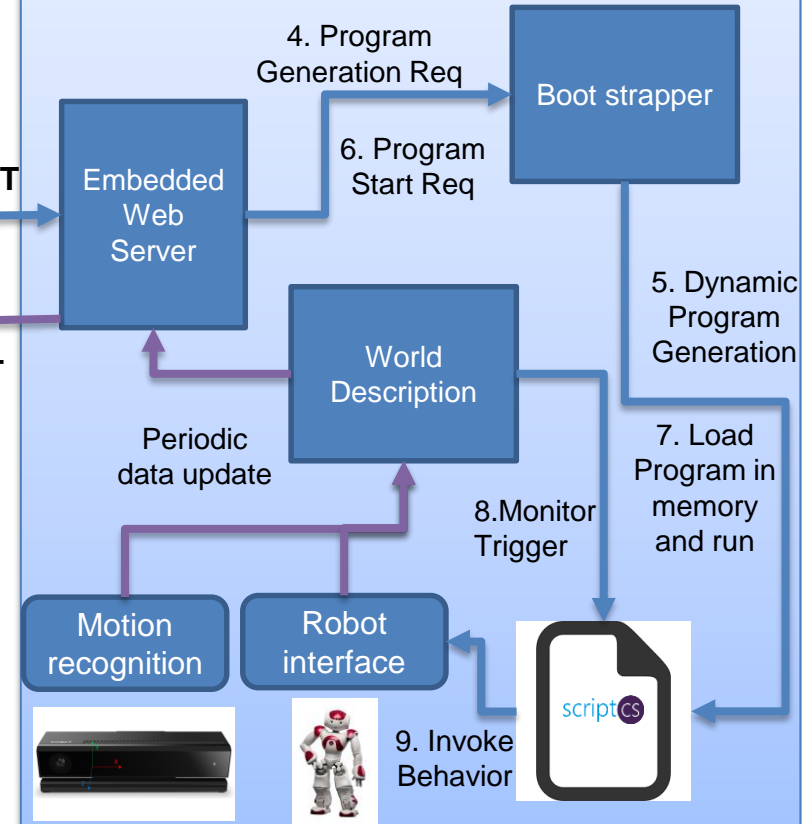
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3   "trigger": "Greet_Right",  
4   "priority": "normal",  
5   "actions": [  
6     {  
7       "name": "stand"  
8     },  
9     {  
10      "name": "wish"  
11    },  
12    {  
13      "name": "crouch"  
14    }  
15  ]  
16 }  
17
```

2. Visual Program to JSON data

3. POST

GET

Experimot Application



Technologies/Brands/Libraries used



three.js



Thank you for your attention!

