Tokyo University of Agriculture and Technology
東京農工大学

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

Praveenkumar VASUDEVAN
European **M**aster in **A**dvanced **RO**botics
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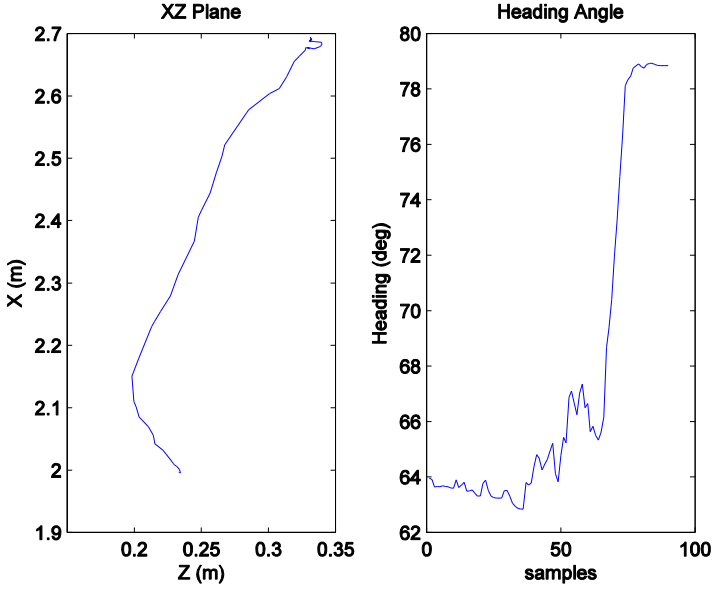
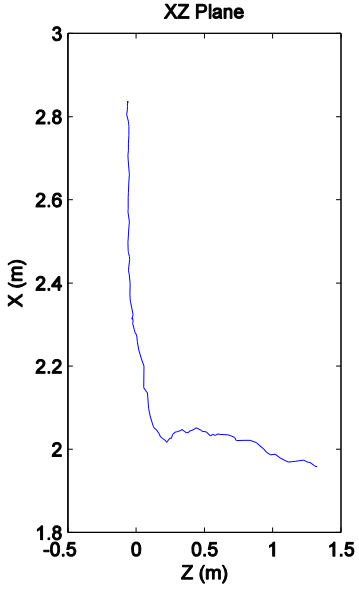
Supervisors : Gentiane VENTURE, Associate Professor, TUAT
Yannick AOUSTIN, Maître de Conférence à l'Université de Nantes
Co-supervisor : Armando TACCHELLA, Associate Professor, University of Genoa

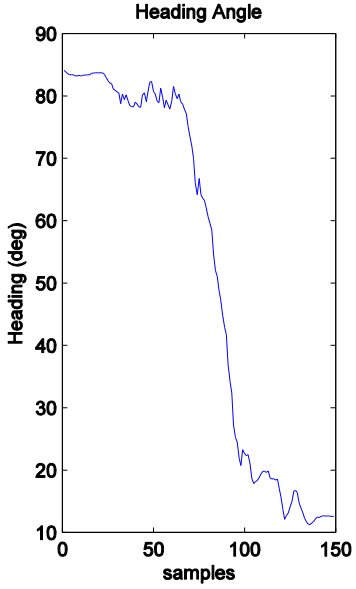
TO-DO List

- Improvement of Pose estimation of marker
  - Removing outliers when the change in angle is large
  - Particle Filter approach using Bayesian filter library
    - Was not able to make it work as expected. Have to spend more time on it.



Straight Movement





Turn right movement

TO-DO List

- 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.

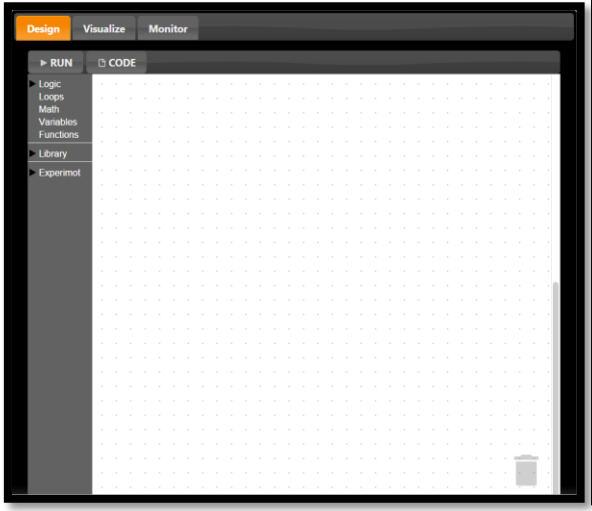
TO-DO List

- 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

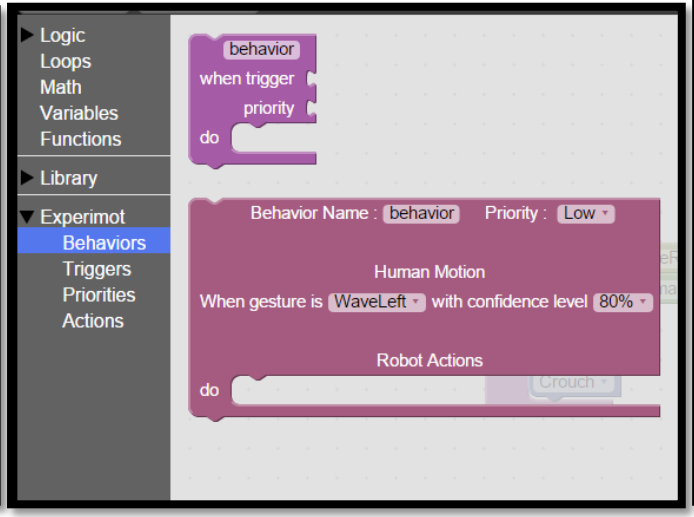
- Develop an easy to use interface for designing behaviors using high level language
  - Web interface developed using a bunch of client side javascript libraries including Blockly and Threejs 3D viewer

- Designing concrete scenarios and evaluate (Receptionist, Something based on IMU?)
  - To be done!

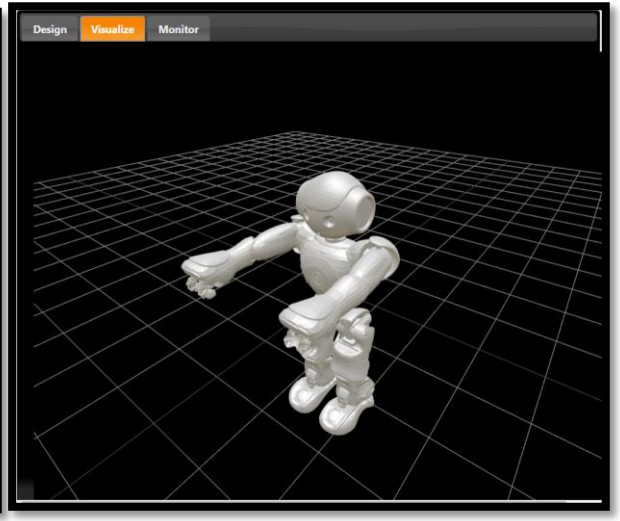
Platform – User Interface concept



Designer

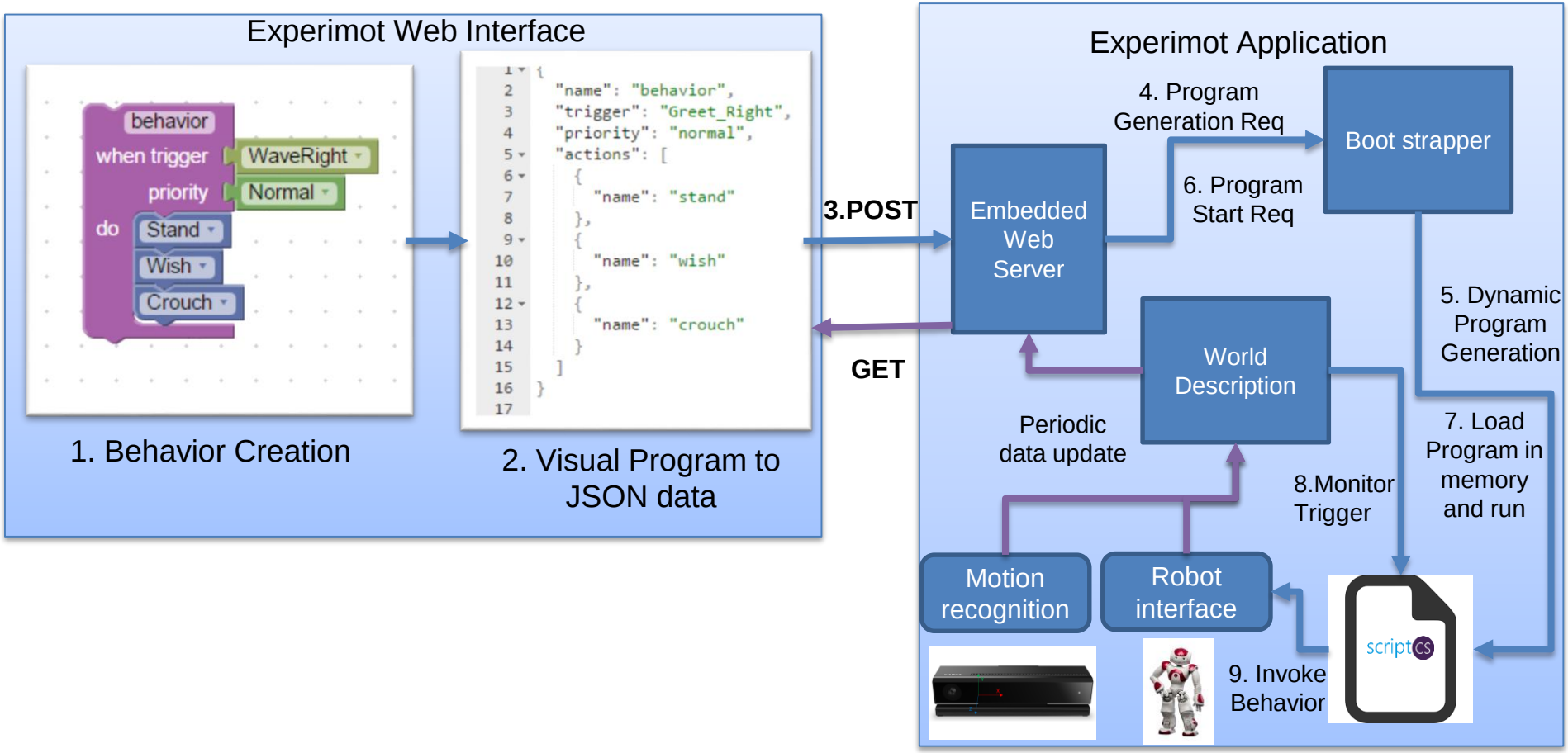


Toolbox



Visualize

Behaviors: Design-Generate-Execute workflow



Thank you for your attention!