Software Requirements Specification for Multi-modal Behavior on Pepper

General Description

The Multi-modal Behavior application will read a multimodal behavior specification, described according to the Behavior Markup Language in JSON format, and execute the specified behavior in the qiBullet simulation environment on Pepper robot.

Functional Requirements

1. The application ***shall*** read any valid BML file provided as a JSON file and stores the specified behavior as a dictionary data type.

2. The application ***shall*** implement a "BehaviorRealizer" class to execute different behaviors.

3. The application ***shall*** create a thread pool using the *threadpool* python library for multiprocessing.

4. The application ***shall*** implement different behaviors as functions of the BehaviorRealizer class, which can be executed as tasks in a thread pool.

5. The "BehaviorRealizer" class ***shall*** have a coordinator method which will assign threads to appropriate behaviors based on the timings specified in the given BML file, and monitor the execution of the threads to enforce these synchronization constraints.

Non-Functional Requirements

1. **Maintainability**: The development team will follow best practices for clean code, documentation, and software modularity in order to make the application as re-usable and maintainable as possible.

2. **Extensibility**: The application will be highly extensible in terms of adding new Behaviors without editing the current file(s).