

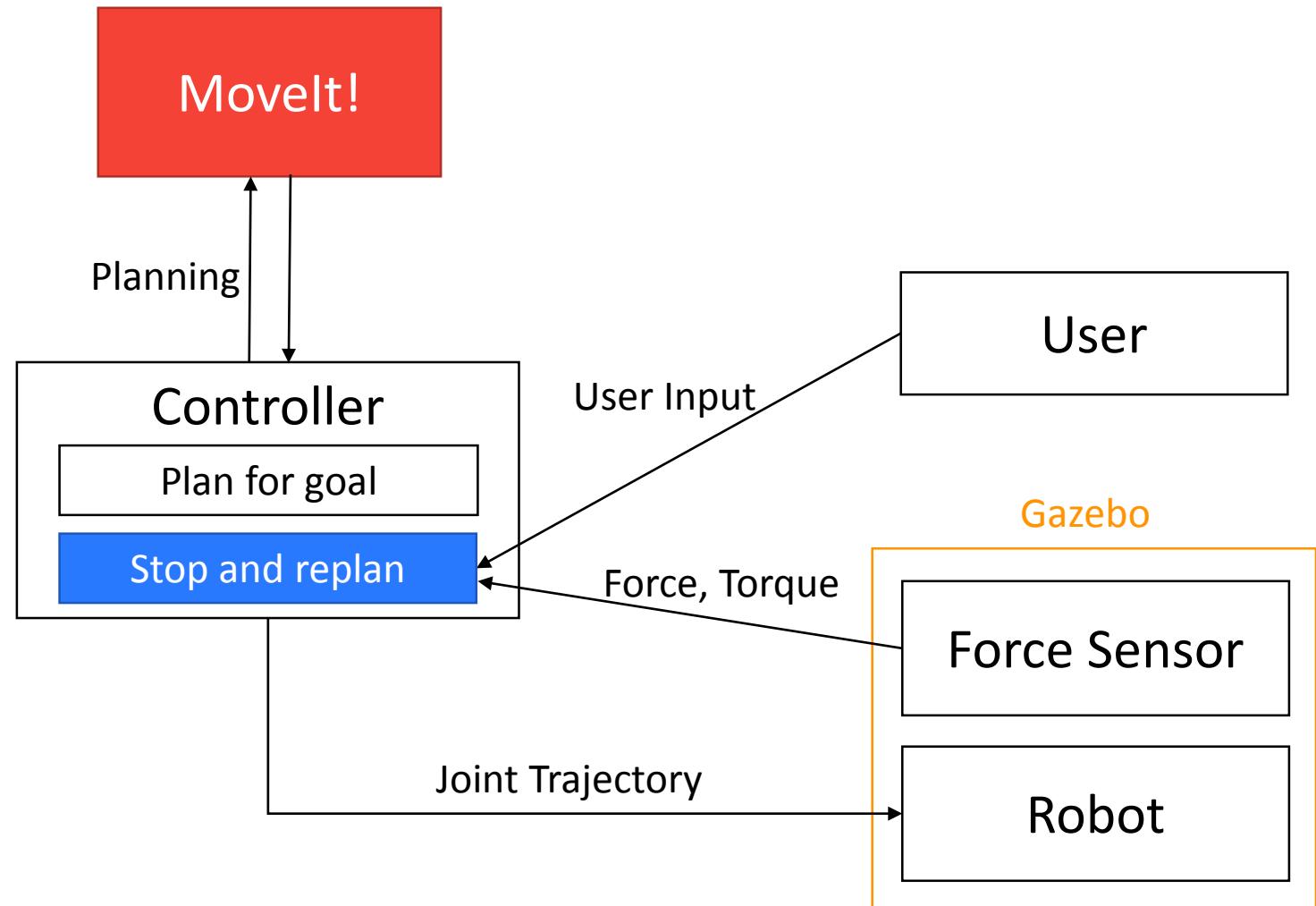
GSOC 2016

Adaptive and Reactive Planning

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System Configuration

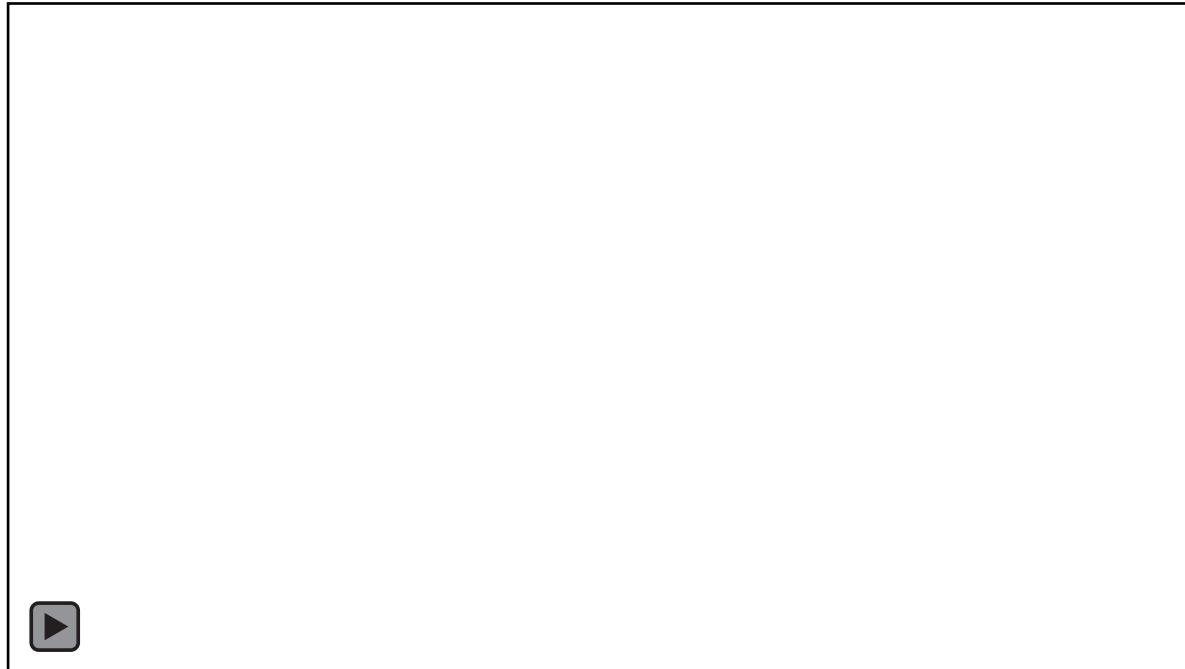
1. Plan for goal with MoveIt!
2. Simulate robot and sensors with Gazebo.
3. Stop execution and replan.
 - With user input.
 - With force sensor input.



Planning with MoveIt

Control robot on Gazebo with MoveIt

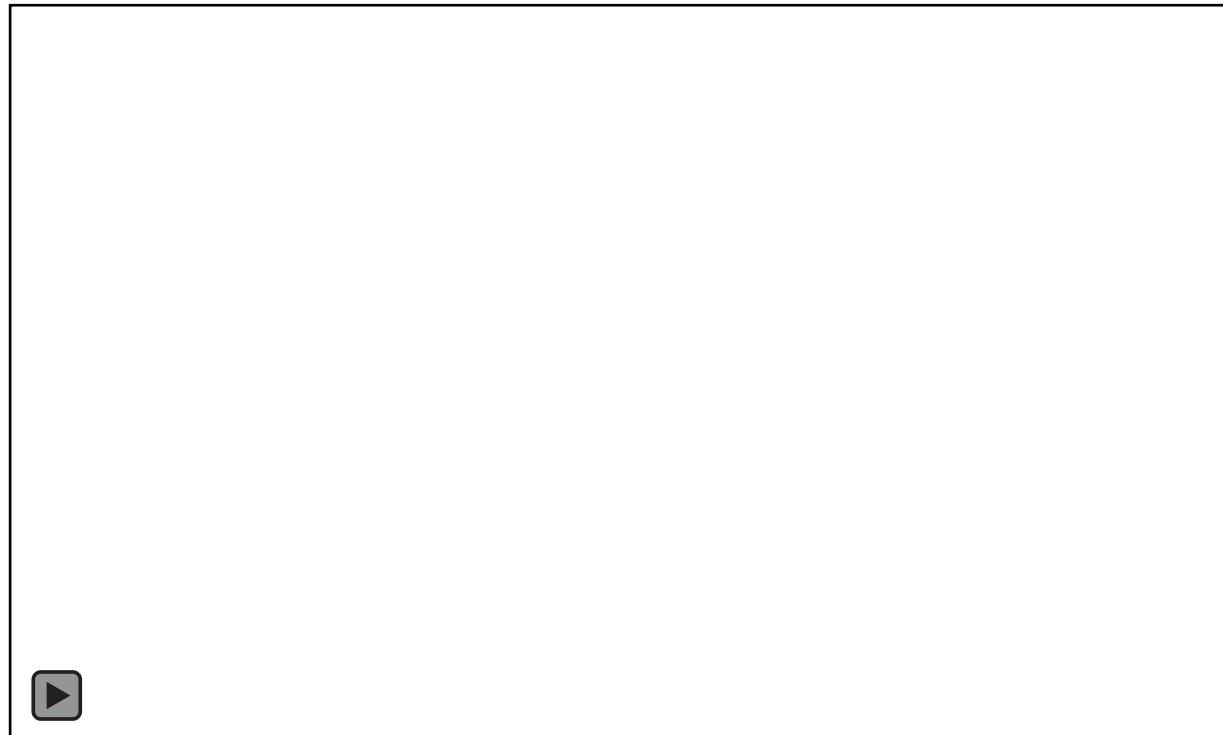
- Spawn robot model on Gazebo
 - https://github.com/ros-industrial/fanuc_experimental/pull/20
- MoveIt config for robot on Gazebo
 - https://github.com/ros-industrial/fanuc_experimental/pull/21



Stop planning execution with user input

Stop request from rviz plugin

- https://github.com/ros-planning/moveit_ros/pull/709



Stop planning execution with force sensor input

Reactive cancelling of planning execution

- https://github.com/ros-industrial/fanuc_experimental/pull/23



Not Reactive:
Robot does not detect collision and breaks



Reactive:
Robot detects collision

Next Step

- Replan by scene remembering
 - For replanning, remembering the scene is necessary.
 - Using MoveIt! scene or Octomap.
- Demo of reactive planning with user input
- Demo of reactive planning with pressure sensor
 - Possibly, picking task in environment with occlusions.

Todo

Reactive and Adaptive Path Planning Using Sensor Feedback and Operator Input

1. Sensor / operator input in real/simulated world
 1. [x] Force sensor in real robot (Fanuc LR Mate 200iD)
 2. [x] Installation & setup simulation.
 3. [x] Implement force sensor plugin.
 4. [x] Software for operator input.
2. Convert these input to be usable by planner
 1. [x] Survey about existing planners and their acceptable inputs.
 2. [x] Software for converting input for planner.
3. Re-planning while the execution of joint trajectory
 1. [x] Survey about existing planners and ROS interface.
 2. [] Software for re-planning.
4. Demonstration
 1. [] Demo with simulation + force sensor
 2. [] Demo with real robot + force sensor
 3. [] Demo with simulation/real + visual sensor