H-BRS
(Masters In Autonomous Systems)

Foundation Course(Hackathon)

TOPIC:
Robust position control of the arm using velocity interface.

MENTOR:
Shehzad Ahmed

MEMBERS:
Padmaja Kulkarni
Ahmad Drak

ARCHITECTURE:

Common motion systems imply three kinds of control mechanisms. They are position control, velocity control and torque control mechanisms. Position control mechanism does not take into consideration dynamic environment in industry, e.g. obstacle. So velocity control or torque control becomes inevitable to use.

In industrial robotic modeling usage of position control causes manipulator to move to its set position with maximum velocity, which is not desirable in dynamic environment. In this project, we will try to control position of robot manipulator joints using velocity interface.

In order to achieve the robust position control of the manipulator, several functionalities are needed. These functionalities will govern reaching to set position, while keeping in mind the re-usability, scalability and the integration aspect of the code. These functionalities are:

1. Constraints satisfaction
2. Control Mechanism
3. Velocity profiling

Velocity profiling will decide the velocity profile of the manipulator arm (e.g. trepzoidal, parabolic). Constrains data file will have all the constraints in the system i.e. maximum torque, maximum velocity, extreme positions and this file can override velocity profile in case of overshooting of limits. Communication functionality will send velocity data to manipulator joint velocity controller depending upon the velocity profiling and constraints file. Which intern will generate output in terms of manipulator joint position control.