Robot Raconteur Implementation

The Robot Raconteur (RR) command 'DesiredJointAngles' allows the user to define 6 joint angles from Matlab. The code snippet below is an excerpt from the RR C# service. The service encapsulates the Staubli API found in the cs8ServerV0, cs8ServerV1, and cs8ServerV3.

Code Snippet - DesiredJointAngles

```
value = createJoint(double[6]); //Create a new joint using the input angles
                                 ...
                 {define constants and configuration parameters}
                                 ...
m_cs8ServerV3.setSchedulingMode(m_sessionId, SchedulingMode.SCHEDULINGINTERNAL);

l_rc = m_cs8ServerV3.resetMotion(m_sessionId);

try
{
 int l_ret = m_cs8ServerV3.moveJJ(m_sessionId, 0, value,l_mdesc, out l_rc);
}
catch(Exceptions...)
{
  Message
}
```

The input to the function 'DesiredJointAngles' is a 6x1 vector containing the six desired joint angles. The 'createJoint' function converts the input joint angles to radians and sets the robot's kinematic operating mode to anthropomorphs.

The 'resetMotion' command clears the TX-40's buffer. If the robot is in motion when the 'resetMotion' command is issued, the robot will stop in place.

The joint angles returned from the 'createJoint' function are then passed to the robot through the 'moveJJ' command.

Observations

Reseting the buffer before sending the next set of joint angles, corrects the delay in execution that was occurring, but clearing the buffer while the robot is in motion causes the new set of joint angles to be ignored. Thus, requiring the new desired angles to be retransmitted.

Issuing consecutive sets of joint angles, results in jittery motion (illustrated by the youtube link below). Waiting until the robot has reached the desired destination does not improve the fluidity of motion, and slows the robot's execution time.

Summary

Using RR and Staubli API, the TX-40 can be directed to any set of joint angles (within the arm limits) with great precision. The robot's motion is not smooth when translating between consecutive points.

Motion Demonstration Video

http://youtu.be/3Py2NRpdkGs