CE554 Progress Report (1 page report)

Team 02

2018/10/22

**This week progress:**

This week we performed

1) To perform various algorithms related to a robot in Choreonoid (full body simulator), we made a body model of quadruped robot based on “.wrl" format according to the parameters of a real quadruped robot that has been newly developed by Hubo Lab.

2) We learned how to use the “QuadProg++” and “RBDL” libraries, the former one is a standard Quadratic Programming solver and the latter one is a rigid body dynamics library, and tested to solve some simple examples based on these libraries.

3) We have started to debug our controller algorithms based on PODO, which utilize RTOS (interrupt timer) providing a real-time thread. The real-time thread generated by RTOS makes it possible to control the end devices in real time.

**Issue:**

1. The generalized coordinates of “RBDL” is quite confusing because it does not mention about which coordinates it is referred to. For example, the ***CalcPointJacobian(Model &model)*** function computes the point Jacobian for a point on a body, but it does not mention whether it is referred to inertial global coordinates or body local coordinates. We used some trial and error methods to find out the answers (it took us quite a long time).
2. When using the “QuadProg++” library, the results of simple examples that we have tested were different from the results solved by MATLAB. We have struggled for a day to find out the reason why the results were different from each other. Finally, we found out the matrices used in the equality and the inequality equation in “QuadProg++” library should be transposed… We learned that a careful examination can prevent a silly mistake!