Cornell Ranger Controller API

Reusable Controller Interfaces for Walking Robots
foot_swing_b_angle = 30
foot_swing_b_softness = 5
foot_swing_c_angle = -20
foot_swing_c_softness = 7
foot_swing_a_angle = 0
foot_swing_a_softness = 2
foot_crutch_b_angle = 0
foot_crutch_b_softness = 3
foot_crutch_c_angle = 0
foot_crutch_c_softness = 6
foot_crutch_a_angle = -45
foot_crutch_a_softness = 1

• Above are Leg and Foot attributes associated with each state, with example target values
• The Leg & Foot are either in “swing” mode or “crutch” mode as the back leg or front leg, respectively
• Angle = 0 degrees when leg is vertical and when foot is horizontal
• Softness = 10 is most soft (swinging freely), Softness = 0 is least soft (immovable)
• Softness = 5 holds the position with the least energy
• These variables will be defined outside the scope of functions with the prefix “GL”
• Two sets of these attributes will exist for the inner and outer legs and feet, and be further prefixed as “inner” or “outer”
Two-State Leg and Foot API

/*
Parameters for each of the following functions are:
a_angle, b_angle, c_angle, a_softness, b_softness, c_softness

Parameters represent the target values that the limb should achieve in the state.
The a, b, c prefixes are associated with the “Push Off”, “Over Top”, and “Impact” states
Return error ID if parameters could not be set, else return zero for success.

Input angles will be mod from 0 to 2*PI.
Foot = 0 degrees when leg is vertical, and foot is horizontal

Softness parameters are set from 0-10.
Softness = 10 is most soft (swinging freely), Softness = 0 is least soft (immovable)
Softness = 5 holds the position with the least energy
*/
int ACT_swing_feet_inner(float , float, float, float, float, float)
int ACT_swing_legs_inner(float, float, float, float, float, float)
int ACT_crutch_feet_inner(float, float, float, float, float, float)
int ACT_crtuch_legs_inner(float, float, float, float, float, float)

int ACT_swing_feet_outer(float , float, float, float, float, float)
int ACT_swing_legs_outer(float, float, float, float, float, float)
int ACT_crutch_feet_outer(float, float, float, float, float, float)
int ACT_crtuch_legs_outer(float, float, float, float, float, float)