CSci 5611
Project - Stick Solo
Proposal

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1 Description

Essence

Inspired from rock climbing, the aim of this project is to simulate agents climbing walls in realistic fashion. Given a wall with some holds and a finish hold, a stick figure agent has to plan a path and climb to reach the finish hold. Most of the motion will be in 2D.

Agent

A stick-figure agent contain rigid links joined by revolute joints. The simplest stick-figure agent is a line stick-figure agent. A simple family of stick-figure agents is the serial stick-figure agents family which contain n-links attached serially. A human-like stick figure agent can have five rigid links with two joints. An agent can hold on to a hold using one of its link ends which which does not have a joint. These are illustrated in the Figures 1, 2, 3.

Figure 1: Simplest stick-figure agent

Figure 2: 2 link, 3 link serial stick-figure agents

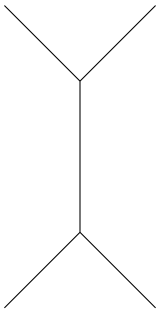

Figure 3: A human-like stick-figure agent

Environment

A 2D wall with holds which can be used to place hands/feet/tails/link-ends. An example is illustrated in the Figure 4

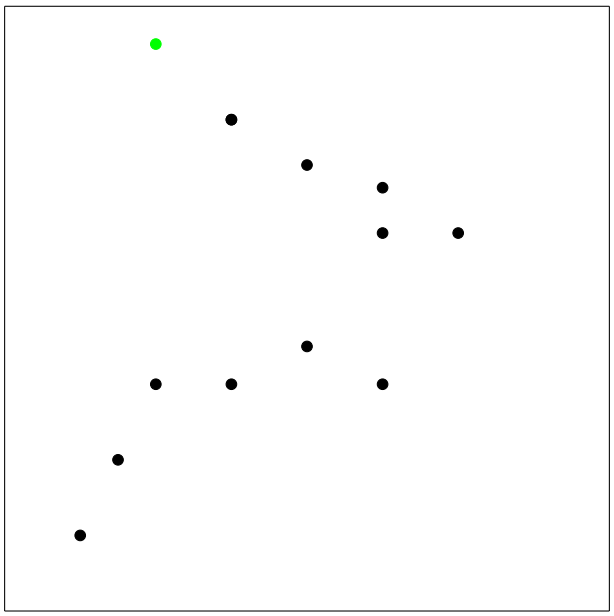

Figure 4: A wall with holds, green is finish hold

Features

Some basic features are listed below

1. Circular and line segment obstacles (model trees or other obstacles)
2. Angle bounds on joints (model skeleto-muscle joints)

Depending on time, feasibility and interest we shall implement some effects like more human-like or animal-like agents, particle effects, 3D context, spatial datastructures, planning in unknown environment etc...

2 Relation to class

This project involves motion planning, inverse kinematics, some particle effects and physical simulation. Therefore it is very much relevant to class.