

CS 175: Assignment 6

Key Frame Animator (Part II)

Due:

Monday, November 1st, 11:59pm

Assignment Objectives

In this second part of the keyframe animation system you will substitute the linear interpolation used in the first part with Catmull-Rom interpolation.

The previous part of this assignment included a system for creating, deleting, editing, and reading/writing keyframes. There was also a hotkey for playing the full animation from the first keyframe to the last at small increments of time using simple linear interpolation to generate frames in between keyframes.

In this assignment you will replace in your code the linear interpolation of the previous assignment by interpolation using Catmull-Rom splines. The submission is the complete system with the same functionality of assignment 5 but using Catmull-Rom interpolation in place of assignment 5's linear interpolation.

Remember that:

- You will need at least 4 key frames for this to work. Between 2 keyframes, you will use the one following and one previous key frame (total of 4) to create Bezier controls using the Catmull-Rom rule.
- The above means that the animation will begin interpolating from the second keyframe and ending in the second-to-last keyframe, advancing in small time increments similarly as was done in assignment 5.
- You will have one spline for each joint angle, for the positions of the robots and skycam, and for the orientations of the robots and the skycam.
- The animation will be viewed from whatever viewpoint is current. This can be changed using the 'v' key (same as in assignment 5.)

During the animation, you will create intermediate states by evaluating the Bezier curves at intermediate times, and then use these intermediate states to display an intermediate frame. For the orientations you will need to use quaternion splines. This will require you to use the quaternion "power" function from assignment 5.