The George Washington University
Department of Computer Science

CS6555 Computer Animation, Fall 2019

Assignment 1 Due: Sept 26, 2019
Basic Key-Framing Motion Control System

Description: Implement a basic key-framing motion control system. Given an input set of key positions and orientations of a rigid object, the system should generate the interpolated motion. The system should accept positions (x, y, z) and orientations given in either Fixed Angles or Quaternions (i.e. your system should allow **both** orientations and allow the user to choose). The in-betweening should be done by Catmul-Rom or B-splines (and your system should allow **both**). Generate some animations to show the differences between using Fixed Angles and Quaternions and the two splines.

Input: a) Geometric data for an object
b) Set of control points, the type (Catmull-Rom or B), and the spacing (dt) to be used in the animation.

Output: Animated view of the object .

Upload to Blackboard:
a) A description of your system (short documentation) that will make it easier to understand your code.
b) Source code
c) Post on discussion board associated with lab: Movie of your animation

Format of the source code: It is important that the grader understand your code. Put enough comments to make it clear what you are doing.

Extensions: For those of you who have had advanced graphics or for those who feel less than challenged by the project, you might want to consider extending the lab. Some suggestions: Allow the user to input the keys not by key-strokes but by interactively positioning/orienting the object (using keys, mouse, dials, 3-D trackers). Allow more than one object in the scene. Allow the user to interactively "edit" the splines by having the splines and the control points displayed in windows. Allow separate speed control. Experiment with different interpolation schemes (e.g. [Kochanek84]). Try out higher order interpolations on the unit quaternion sphere. Allow interpolation of deformable objects.