

Millersville University Department of Computer Science

**Dr. Roger W. Webster**

**CS375 Graphics Assignments**

**Laboratory Assignment Four**

CS375 Graphics

Roger W. Webster, Ph.D.

Department of Computer Science

Curvature Functions and Bezier Curves

1. You will be given a mario world from my web site with 1 toad and multiple objects in the Mario box world. You are to use the Bezier curve computations from lecture to compute a very smooth trajectory curve from the source point to a destination point through all the marked points (in a file) (see my demo on the website <http://www.cs.millersville.edu/~webster/cs375/assignments/>). Make the camera view the entire movement of the toad via a birdseye viewpoint. Make a second camera (upper left) show what the toad sees. Show graphically (the curve line) of the toad's path that it will take. Notes:

- o Make the toad face the direction of the Bezier path (looking forward).
- o Play a background sound while the toad moves around
- o The source point, destination point, and points in between will be in a file.
- o Add Catmull-Rom spline and Hermite curve computations for the curve points.
- o The source point, destination point, and all points will be in a file.
- o Draw all three curve lines all the time (red -> Bezier, Blue -> CatMull-Rom, Green -> Hermite Curve).
- o WASD and Xbox controller for camera movements, make sure from birdseye cam that you don't pitch or roll
- o F1 -> toadstool traverses Bezier curve
- o F2 -> toadstool traverses Catmull-Rom curve
- o F3 -> toadstool traverses Hermite curve
- o F9 -> toggles the drawing of the control points and lines off and on
- o F10 -> toggles the drawing of the boundary points off and on
- o Put these commands on the screen so everyone knows what does what

