CAP 4730 – Assignment 4 (Optional)
Due April 30, 2024

Curve Design

Design a user interface so that the user can input several control points. Then design a cubic C^1 Bézier curve from the control points. Input enough control points to have at least two segments. Draw the curve using:

- The blending functions or matrix form. `10pt`
- The de Casteljau's algorithm. `10pt`
- Subdivision: Allow the user to step through the subdivision process for several levels. You may use OpenGL for drawing lines or your own line drawing algorithm. `20pt`
- Chain two Bezier curves so that they form a C^1 curve. Modify the control points so that the curve becomes only G^1 and comment on the differences. `10pt`
- Create a report on the results of each method discussed above. Explore and discuss what happens when a control point is repeated (e.g., $P_0 = P_1$). Also comment on the advantages and disadvantages each approach. Include images of at least two different configurations of control points and show how each method renders the curve.
- This is an individual effort assignment. The source code and report you submit MUST be your own work. You need to clearly acknowledge sources (ideas, solutions, websites) that you use.

Submission Guidelines
Submit your PDF report by email.
Due to grading deadlines, no late submissions are accepted for this assignment.