Fakultät für Informatik
Labor für Computergrafik
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Assignments 2

„Geometric Modeling“

Deadline 24.05.2023.

Framework for the assignments:
Download the zip-file for the assignments from the moodle page of the course:

- The file **`glwidget.cpp`** contains a framework, for the required implementations. Comments mark the relevant lines in the code.
- The framework is based on OpenGL and Qt. The zip-file contains a Qt-project-file (.pro), which can be opened using the Qt-menu of VisualC++. It contains an executable framework including a GUI, see Figure 1.

The functionality of your implementation will be tested using the source code!

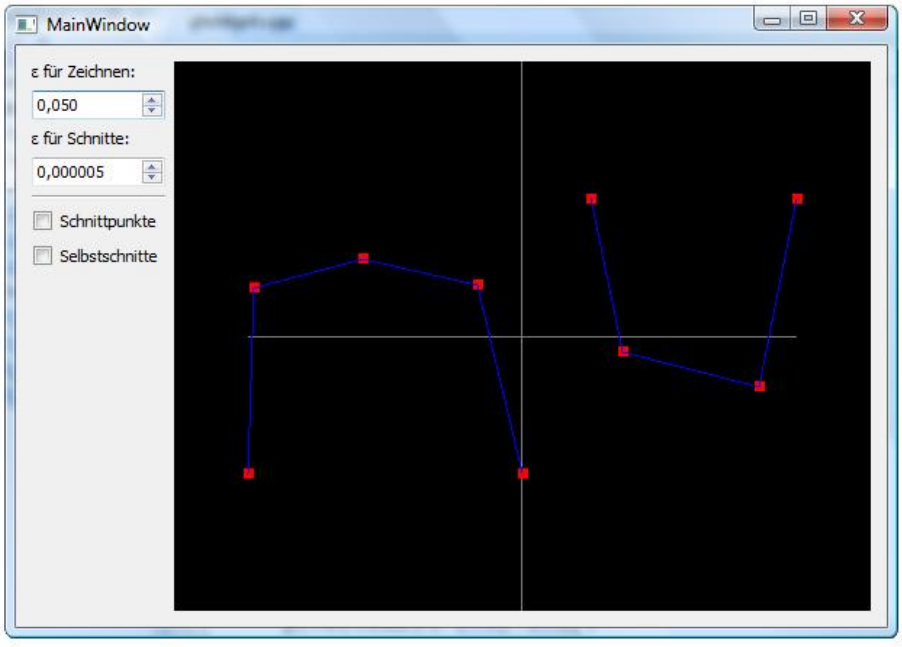

Figure 1 The GUI of the framework for assignments 4 and 5.

Part 1 (Bézier-curves: drawing, intersections, self-intersections)

Integrate three functions into the framework:

a. Implement a function to draw a Bézier-curve. The control points of two Bézier curves are pre-defined in the framework. Use **`epsilon_draw`** for the termination condition.

b. Implement a function to compute all intersections of two Bézier curves. Use the parameter **`epsilon_intersection`** in the termination condition.

c. Implement a function to compute all self-intersections of a Bézier curve.

Part 2 (Bézier-curves: C^k-transitions)

Implement a function that computes for a given Bézier curve of degree n and one additional point a new Bézier segment of degree n with a C^{n-1}-transition. The additional point is the end point of the new segment.