

## CSCI 3161: Introduction to Computer Graphics and Animation — Assignment 3

Summer Term 2018

due date: Wednesday, July 25

Use OpenGL and what you have learned about parametric cubic curves to create a 3D animation of a roller coaster ride. Using a keystroke command, it should be possible to switch between the views of a camera that slowly circles the coaster from the outside, and one that rides the coaster. More detailed instructions and useful hints can be found on the lecture slides and will be discussed in class. Please note the following requirements:

- Your program must compile and run using `gcc`. Do not use any platform-specific libraries.
- You should use the GLUT timer callback for the animations and achieve a frame rate of at least 25 frames per second in a window with a size of no less than  $320 \times 320$ .
- There is no need for over-elaborate coaster designs; however, the track should not be too simple.

Marks will be based on the proper implementation of the curve, smoothness of the motion of the camera ( $C^2$ -continuity is required), physical realism, appearance of both the coaster and the environment, good presentation of the scene, and programming style and documentation.

**Submission instructions:** Submit your source code on *Brightspace*. Please also submit a one-page document detailing all features of your program, any formulas or algorithms used other than those discussed on the lecture slides, and a brief explanation of which of the required features work and which don't. Remember that

- you may discuss assignments with each other, but you must program your solutions independently
- all work you submit must be your own
- you must not share your code with anyone
- you must not make use of any code you find on the web with the exception of the sample programs that come with the textbook