

CS-411 – Assignment 1 (5%)

Raster Graphics

Due by: September 20, 2016

1. Implement the Bresenham straight line algorithm. Make sure that your implementation uses integer addition/subtraction operations only. The function should get as input the starting point (2D in pixels), ending point (2D in pixels), and color (RGB), and should render the line by setting pixels in a target image according to the specified color.
2. Implement the scanline triangle filling algorithm for an arbitrary triangle. The algorithm works by computing the starting and ending points of HORIZONTAL scanlines and then filling between these points. The function should get as input three vertices (2D in pixels), and color (RGB), and should render a filled triangle by setting pixels in a target image according to the specified color. Two filling modes should be supported: filling with a uniform color, and filling with a different random color for each scanline (to help verify the correctness of your implementation).
3. Write a program that renders random triangles and lines using random colors and locations continuously so that a new triangle or line is rendered every 0.1 seconds.
4. Have buttons to toggle: line drawing, triangle drawing, fill mode for triangle drawing (uniform color or different scanline colors), and pausing the animation.
5. A skeleton program will be provided. You are not required to use the provided skeleton program and may modify it as needed.

Electronic Submission Instructions

Please follow the following submission procedure:

1. Use JavaScript and WebGL. Test your program on a recent version of Firefox or Chrome and indicate in the code and the report the browser (name+version) the program was tested on. Include a copy of all external JavaScript files so that the program can run locally.
2. Direct all questions/comments regarding the assignment to: *cs411@cs.iit.edu*
3. On or before the due date upload a ZIP file with the necessary components into blackboard. Please do not email the assignment. The ZIP file should contain the following:
 - Report: prepared as a PDF file. The report should contain a summary of program design issues, description of specific problems you faced and the way in which you solved them, and sample input/output results (text/graphic). The report needs to be sufficiently detailed.
 - Source code: all the source code and data files that are necessary to run your program.

Note: we must be able to view your report and execute your program in order to grade it

4. The organization of the submitted material should be as follows:
 - Create a directory called: `first_last_ass#` where “first”/“last” is your name and “#” is the assignment number.
 - Inside this directory create four sub-directories called: `code`, `report`, `lib`, `data`. Place in these directories the files you need to submit.
 - Please do not use space inside file/directory names.
5. Do not submit a paper copy of your report. You will be contacted by email if some material is missing or if you will need to meet with the TA.
6. If you are late in the submission upload it as soon as you have it. “late days” will be determined by your sybmission date.