CSI 494 — SpTp: Computer Graphics

Homework #1, Due "by" class Thursday, September 14. Documentation (described below) is due by class Tuesday, September 19. Make sure your code is in a 494 directory for examination. Print relevant code and be sure not to modify your code after hand-in time, or you will receive a 0.

In this homework you will be implementing the DDA and the Bresenham midpoint line rasterization techniques. Remember your program must compile and execute or you receive a 0.

Project Requirements:

1. **Requirements:**
   (a) Provide a way to switch between each algorithm using the keyboard. When the user presses 'd', use the DDA algorithm. When the user presses 'm', use the Bresenham algorithm. When the user presses 'g', use the OpenGL algorithm. When the user presses 't', plot all three in different colors.
   (b) Provide a keyboard entry method. When the user presses 'k', allow the user to give the starting and stopping 2D coordinates of a line.
   (c) Provide a mouse entry method. When the user presses the left mouse button down to start a line, and lifts up the button to end the line.
2. **Documentation:** Provide a README which documents your work. Be sure to describe the functionality of each item available in a key press and on a mouse click. While this may seem repetitious, it is a good habit for future projects, and is required for this project in particular. In addition, describe any problems you've encountered and add suggestions for future work. Discuss how DDA, Bresenham and OpenGL are fundamentally different by design and describe visually the difference between the algorithms. Explain this difference and why it makes sense to you.
3. **Grading:** Your grade is based mostly on correct implementation. It should go without saying, but: do not copy code from any source or you will fail.
4. **Extra Credit:** Allow the line to rubberband. In particular, as you move the mouse around and have the button pressed down, redraw the line that should be drawn if you let go of the mouse right away. The line should stretch like a rubberband to follow your mouse pointer.