Lab-01: Draw 2D objects with OpenGL

CSC411: Computer Graphics Vo Hoai Viet (vhviet@fit.hcmus.edu.vn)

Objective

In this lab, the students will implement the algorithms to draw 2D Objects using OpenGL Library.

Requirements

- Draw 2D objects include: line, circle, ellipse, parabola, hyperbola using taught algorithm (DDA, Bresenham, Mid-Point) using Open GL & GLUT
- Benchmark & compare your result (in time & accuracy) with existed functions in OpenGL.
- Write programs in OOP methodology.

Input:

- Text file that have *N* lines
- Each line represents 1 object, that have M values separated by space. First value indicates object type, while the others indicate object parameters (all distances are pixel length)
- *Line draw by DDA algorithm:*

(X1, Y1): begin point (X2, Y2): end point

• Line draw by Bresenham algorithm:

(X1, Y1): begin point (X2, Y2): end point

• Circle draw by MidPoint algorithm:

(XT, YT): center point

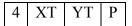
R: radius

• Ellipse draw by MidPoint algorithm:

3	XT	YT	Α	В
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(XT, YT): center point A: ½ major length B: ½ minor length

• Parabola draw by MidPoint algorithm:



(XT, YT): center point

P: focal length

• Hyperbola draw by MidPoint algorithm:



(XT, YT): center point

A: major length B: minor length

Output:

- Program that build as Release configuration attached with glut.dll
- GLUT/ screen: draw object
- Console: execution time in millisecond (ms)
- Report (Latex):
 - Comparison of execute time of each object between self-implementation algorithm and Open GL function
 - Comment about the accuracy of implemented algorithm.

Submission

Create 3 folder, compressed in 1 file MSSV Lab1.zip

- Document
- Release
- Source

Resources

• Graham Sellers, OpenGL SupperBidle, Cheapter 1, 2, and 3.