Visual Computing and Multimedia

Abel J. P. Gomes

LAB. 6

RASTERIZATION ALGORITHMS

1. Objectives
2. References
3. Exercises

Lab. 3

RASTERIZATION / SCAN CONVERSION

1. Objectives

In general terms, the idea of this labwork is to learn the fundamental rasterization techniques and algorithms, in particular those related to:
– straight line segments (e.g., DDA, Bresenham, etc);
– triangles;
– polygons.

2. References

James D. Foley, Andries van Dam, Steven K. Feiner, and John F. Hughes. Computer Graphics: Principles and Practice in C (2nd Edition). Addison-Wesley Professional, 1995.

http://www.netgraphics.sk/rasterization-a-line

http://www.angelfire.com/linux/myp/LineRas/LineRas.html

http://www.cs.ucr.edu/~macchiea/cs130w11/lab1/

3. Exercises

1) Implement the direct scan conversion (DSC) algorithm for straight line segments.

2) Implement the direct digital analyzer (DDA) algorithm for straight line segments.

3) Implement the Bresenham algorithm for straight line segments.

4) Implement the midpoint circle algorithm.

5) Implement the midpoint ellipsis algorithm.

6) Implement a scan conversion algorithm for triangles.

7) Implement a scan conversion algorithm for convex polygons.

8) Implement a scan conversion algorithm for non-convex polygons.