CS401 COMPUTER GRAPHICS 3-0-0-6

Syllabus : Introduction and organization of an interactive graphics system; Scan conversion: line, circle, and ellipse; Filling: rectangle, polygon, ellipse, and arc; Clipping: line, circle, ellipse, and polygon; Antialiasing: unweighted and weighted area sampling, and Gupta-Sproull methods; Transformations: 2D and 3D, homogeneous coordinates, composite and window-to-viewport transformations; 3D View: projections, specification and implementation of 3D view; Curves and Surfaces: polygon meshes, parametric cubic curves and bicubic surfaces, Hermite, Bezier, and B-splines curves and surfaces; Quadric surfaces; Solid Modeling: Boolean set operations, spatial partitioning methods (occupancy enumeration, octree, and binary space partitioning tree); Hidden line and surface removal: z-buffer, list-priority, and scan line algorithms, algorithms for binary space partitioning trees and octrees, and ray tracing; Shading: illumination model, polygon shading (interpolated, Goursud, and Phong), texture mapping, shadow determination (scan line and z-buffer algorithms), transparency, global illumination model; Introduction to GPU and animation.

Texts :

1. D. Hearn and M. P. Baker, Computer Graphics with OpenGL, 3/e, Pearson, 2009.

References :

1. E. Angel. Interactive Computer Graphics: A Top-Down Approach using OpenGL, 5/e, Pearson, 2009.
2. J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes. Computer Graphics: Principles and Practice in C, 2/e, Addison-Wesley, 1995.
3. P. Shirley and S. Marschner. Computer Graphics. India Edition, Cengage Learning, 2009.
4. F. S. Hill. Computer Graphics using OpenGL, 3/e, Pearson, 2009.