

Computer Graphics & Multimedia

Session 1: Introduction

1. Computer Graphics: definition, classification & Applications.
2. Development of Hardware & Software for Computer Graphics.
3. Display devices, Hard copy devices. Interactive Input devices, display processor, Line drawing.
4. Various algorithms and their comparison.
5. Circle generation- Bresenham's mid point circle drawing algorithm, mid point ellipse drawing algorithm.

Session 2: Transformation

1. Attributes of output primitives, line style, color and intensity.
2. Area filling algorithms, Scan line algorithm, boundary fill flood fill algorithm, Antialiasing techniques.
3. Two dimensional transformations: translation, scaling, rotation.
4. Reflection sheering, composite transformation, transformation commands, character generation.

Session 3: Coordinates, Clipping & Illumination Model

1. Viewing coordinates, Window, view port, clipping.
2. Window to view port transformation, line clipping algorithm; Cohen Sutherland, polygon clipping; Sutherland hodgman algorithm.
3. 3D clipping: Normalized view volumes, view port clipping, clipping in homogeneous coordinates.
4. Illumination model: Light sources, diffuse reflection specular reflection.
5. Reflected light, intensity levels, surface shading.
6. Phong shading ground shading, color models like RGB, YIQ, CMY, HSV etc.

Session 4: 3D Viewing

1. 3-D Viewing: Three-dimensional concepts, 3D display techniques.
2. 3D representation polygon & curved surfaces.
3. Design of curves & surfaces- Bezier's Method, B-spline methods.
4. 3D transformation translation, scaling, composite transformation rotation about arbitrary axis.
5. Projections: Parallel & Perspective, Hidden surface and line removal; back face removal, depth buffer and scan line methods.

Session 5: Introduction to Multimedia

1. Introduction to multimedia, multimedia components.
2. Multimedia hardware, SCSI, IDE, MCI.
3. Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG.
4. Multimedia tools, presentations tools, Authoring tools, presentations.

Book References

1. D.Hearn and M.P. Baker “Computer Graphics” (2nd ed), PHI.
2. S. Harrington – “Computer Graphics - a Programming approach” (2nd ed) McGrawhill.
3. New Mann & Sprovl- “Principles of interactive computer graphics” (2nd ed) McGrawhill.
4. Roger S. David “Procedural Elements for Computer Graphics”, McGraw Hill.