

Mid Term Exam Review for CS480/580

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Chapter 1: The advantage of interactive computer graphics (1.2); representative uses of computer graphics (1.3); output technology (1.5.1)(see lecture notes). software portability and graphics standards (1.5.3); application modeling (1.6.2); describing to the graphics system what is to be viewed (1.6.3); interaction handling (1.6.4).

Chapter 3: Scan converting lines (3.2); the basic incremental algorithm (3.2.1); clipping lines (3.12); clipping end points (3.12.1); clipping lines by solving simultaneous equations (3.12.2); the cohen-sutherland line-clipping algorithm (3.12.3); anti-aliasing (3.17); increasing resolution (3.17.1); un-weighted area sampling (3.17.2); weighted area sampling (3.17.3).

Chapter 5: Geometric transformations: 2D-transformations (5.1); homogeneous coordinates and matrix representations of 2D transformations (5.2); composition of 2D transformations (5.3); matrix representation of 3D transformations (5.6); composition of 3D transformations Method I and II (5.7); transformations as a change in coordinate system (5.8). Also, review of matrix operations: multiplications, inverse of a matrix, inverse equals the transpose of a matrix when the matrix is orthogonal (what is an orthogonal matrix). Vector operations: vector cross product, physical significance, how to take vector cross product when two vector (directions) are given, difference between a 3D-point and 3D-vector, calculating dot product of two vectors, physical significance of dot product of two vectors being zero (they would be perpendicular), what is the inverse of rotation, translation, and scaling matrices.

Chapter 6: Viewing in 3D, projections (6.1); perspective projections (6.1.1); parallel projections, oblique parallel projections, cavalier and cabinet projections (6.1.2) associated matrices (see lecture notes); specifying an ar-

bitrary 3D view in VRC system, VRP, VUP, PRP, CW, u_{min} , v_{min} , u_{max} , v_{max} values, F and B values, view volumes (6.2); the mathematics of planar geometric projections Mper matrix, Mort matrix (6.4); Implementing planar geometric transformations parallel canonical view volume (6.5); Parallel projection (6.5.1) (see lecture notes). Perspective Projection (6.5.2) (see lecture notes); 3D-clipping Clipping against a (perspective and parallel) Canonical View Volume in 3D (6.5.3), Clipping in homogeneous Coordinates: matrix M converting perspective canonical view volume to parallel view volume (6.5.4, pp. 275 only) (See lecture notes).

Chapter 11: Representing curves and surfaces, polygonal meshes (11.1), representing polygonal meshes (11.1.1, explicit polygons, pointers into a vertex list, explicit edges).