

CCS333-AUGMENTED REALITY/VIRTUAL REALITY

2.4) TRANSFORMATION MATRICES:

Transformation matrices play a crucial role in computer graphics and modeling, enabling the representation and manipulation of objects in three-dimensional space. Common types of transformation matrices include:

1. TRANSLATION MATRIX:

- Represents translations (movements) along the x, y, and z axes.

2. ROTATION MATRIX:

- Represents rotations around the x, y, and z axes. Different matrices are used for rotations in each axis.

3. SCALING MATRIX:

- Represents scaling operations along the x, y, and z axes.

4. TRANSFORMATION MATRIX:

- Combines translation, rotation, and scaling operations into a single matrix for efficient transformation.

5. VIEW MATRIX:

- Defines the position and orientation of the virtual camera, allowing for the transformation of objects relative to the camera's viewpoint.

6. PROJECTION MATRIX:

- Represents the projection of 3D objects onto a 2D screen, considering perspective and depth.

7. MODEL-VIEW-PROJECTION (MVP) MATRIX:

- Combines the view and projection matrices to represent the complete transformation from object space to screen space.

8. AFFINE TRANSFORMATION:

- Affine transformations preserve parallel lines and ratios of distances, including translation, rotation, scaling, and shearing.

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OBJECT POSITION:

Object position refers to the location of an object in a given coordinate system within a virtual or physical environment. In computer graphics, objects are typically represented in three-dimensional space, and their position is defined by coordinates along the x, y, and z axes. Manipulating object positions is a fundamental aspect of modeling and animation, and it involves using transformation operations such as translation, rotation, and scaling.

