QuickDraw 3D Glossary of Terms - T to Z (11/95)

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TOPIC ---

This article is a glossary of terms for QuickDraw 3D.

DISCUSSION --

tangent: A line or plane that intersects a curve or surface at a single point. Compare surface tangent.

tessellate: To decompose a curve or surface into polygonal faces.

text file: A file object whose data is a stream of ASCII characters with meaningful labels for each type of object contained in the file. Compare binary file.

texture: See texture object.

texture mapping: A technique wherein a predefined image (the texture) is mapped onto the surface of an object in a model.

texture object: A type of QuickDraw 3D object used to perform texture mapping. Compare pixmap texture object.

texture parameterization: A parametric function that maps the unit square to a texture.

texture shader: A type of surface shader that applies textures to surfaces.

tolerance: See edge tolerance, vertex tolerance.

top elevation projection: A type of elevation projection in which the view plane is parallel to the top of the object being projected. Also called plan elevation projection.

tracker: See tracker object.

tracker coordinates: The current settings (that is, position and orientation) of a tracker.

tracker notify function: A function that is called whenever the coordinates of a

tracker change by more than a specified amount.

tracker object: A QuickDraw 3D object that represents the position and orientation of a single element in your application's user interface. A tracker object is an instance of the TQ3TrackerObject class. See also controller object.

tracker serial number: A unique number that changes every time the coordinates of a tracker are updated by a controller.

tracker threshold: The amount by which a tracker's coordinates must change for the tracker notify function to be called.

transform: See transform object.

transform object: A type of QuickDraw 3D object that you can use to modify or transform the appearance or behavior of a QuickDraw 3D object. A transform object is an instance of the TQ3TransformObject class.

translate: To reposition an object by adding values d x , d y , and d z to the x, y, and z coordinates of each of its points.

translate transform: A type of transform that translates an object along the x, y, and z axes by specified values.

transparency: The ability of an object to allow light to pass through it.

transparency color: A color of type TQ3ColorRGB that determines the amount of light that can pass through a surface. The color (0, 0, 0) indicates complete transparency, and (1, 1, 1) indicates complete opacity.

transpose: (n.) For an m ¥ n matrix with elements a ij , the n ¥ m matrix with elements b ij such that b ij = a ji . (v.) To form the transpose of a given matrix.

transpose matrix: See transpose.

triangle: A closed plane figure defined by three edges. Defined by the TQ3TriangleData data type.

trigrid: A grid composed of triangular facets. Defined by the TQ3TriGridData data type.

type: See object type.

under-color shader: A shader associated with some other shader that supplies an under color for surfaces shaded by that shader.

uniform scaling: A scale transform in which the scaling values d x , d y , and d z are all identical. Compare differential scaling.

union: The set of points that lie inside either of two given solid objects. The union of the objects A and B is represented by the function A » B. Compare

complement, intersection.

unit cube: A box whose three defining edges have a length of 1.

unit vector: See normalized vector.

UNIX path name storage object: A storage object that represents a file using a path name.

UNIX storage object: A storage object that represents a file using a structure of type FILE (defined in the standard I/O library). Compare UNIX path name storage object.

unknown object: A type of QuickDraw 3D object that is created when QuickDraw 3D encounters data it doesn't recognize while reading a metafile. An unknown object is an instance of the TQ3UnknownObject class.up vector A vector that indicates which direction is up. A camera has an up vector that defines its orientation. Compare camera placement.

user interface view: See user interface view object.

user interface view notify function: A function that is called whenever one of your user interface views needs to be redrawn.

user interface view object: A type of view that allows the user to interact (using interface elements such as a 3D cursor or widgets) with the 3D objects displayed in the view. A user interface view object is an instance of the TQ3UIViewObject class.

valid range: The range of u and v parametric values for a standard surface parameterization. For QuickDraw 3D, the valid range is the closed interval [0.0, 1.0].

vector: A pair or triple of floating-point numbers that obeys the laws of vector arithmetic. Defined by the TQ3Vector2D and TQ3Vector3D data types. Compare cross product, dot product, normal.

vector-normal interpolation shading: See Phong shading.

vector product: See cross product.

vertex: A dimensionless position in three- or four-dimensional space at which two or more lines (for instance, edges) intersect, with an optional set of vertex attributes. Defined by the TQ3Vertex3D and TQ3Vertex4D data types. See also mesh vertex.

vertex attribute: An attribute that defines a characteristic of a vertex of a polygonal object.

vertex index: In a mesh, a unique integer (between 0 the total number of vertices in the mesh minus 1) associated with a vertex. Compare face index.

vertex tolerance: A measure of how close two points must be for a hit to occur.

Compare edge tolerance.

view: See view object.

view attribute: An attribute that defines a characteristic of a view object.

view-based shader: A shader that operates independently of the material properties or orientation of objects (in other words, that operates solely on aspects of the view, such as the camera position). Compare surface-based shader.

viewing box: The rectangular box defined by an orthographic camera and the hither and yon clipping planes. Compare viewing frustum.

view coordinate system: See camera coordinate system.

viewer: See viewer object.

Viewer: See 3D Viewer.

viewer badge: See badge.

viewer controller strip: See controller strip.

viewer flags: A set of bit flags that specify information about the appearance and behavior of a viewer object.

viewer frame: See viewer pane.viewer object An instance of the 3D Viewer. A viewer object is of type ViewerObject.

viewer pane: The portion of a window occupied by a viewer object. The pane includes the picture area and the controller strip.

viewer state flags: A set of bit flags returned by the Q3ViewerGetState function that specify information about the current state of a viewer object.

viewing frustum: The rectangular frustum defined by a perspective camera and the hither and yon clipping planes. Compare viewing box.

view hints object: An object in a metafile that gives hints about how to render a scene.

view idle method: A callback routine that is called during lengthy rendering operations. Compare file idle method.

view information structure: A data structure that contains information about a view. Defined by the TQ3ViewInfo data type.

viewing direction: The direction of a view's camera. Also called the camera vector or the viewing vector.

viewing vector: See viewing direction.

view mapping matrix: A matrix maintained by QuickDraw 3D that transforms the viewing frustum into a standard rectangular solid. The world-to-frustum transform is the product of the transforms specified by the view orientation matrix and the view mapping matrix. Compare view orientation matrix.

view object: A type of QuickDraw 3D object used to collect state information that controls the appearance and position of objects at the time of rendering. A view object is an instance of the TQ3ViewObject class.

view orientation matrix: A matrix maintained by QuickDraw 3D that rotates and translates a view's camera so that it is pointing down the negative z axis. The world-to-frustum transform is the product of the transforms specified by the view orientation matrix and the view mapping matrix. Compare view mapping matrix.

view plane: The plane onto which a model is projected. Also called the projection plane.

view plane camera: A type of perspective camera defined in terms of an arbitrary view plane.

view plane camera data structure: A data structure that contains basic information about a view plane camera. Defined by the TQ3ViewPlaneCameraData data type.

view plane coordinate system: The two-dimensional coordinate system whose origin is the point at which the viewing direction intersects the view plane and whose positive y axis is parallel to the camera's up vector.

view port: See camera view port.

view space: See camera coordinate system.

view status value: A value returned by the Q3View_EndRendering function that indicates whether the renderer has finished processing the model.view volume The part of world space that is projected onto the view plane during rendering. See also view box, view frustum.

virtual: See synthetic.

virtual camera: See camera object.

visual line determination: See hidden line removal.

visual surface determination: See hidden surface removal.

warning: A condition that, though less severe than an error, might cause an error if your application continues execution without handling the warning. See also error, notice.

widget: An element of an application's 3D user interface.

window coordinate system: The coordinate system defined by a window. Also called

the screen coordinate system or the draw context coordinate system. Compare camera coordinate system, local coordinate system, world coordinate system.

window picking: See screen-space picking.

window-point pick data structure: A data structure that contains information about a window-point pick object. Defined by the TQ3WindowPointPickData data type.

window-point pick object: A pick object that tests for closeness between a point in a window and the screen projections of the objects in the model.

window-rectangle pick data structure: A data structure that contains information about a window-rectangle pick object. Defined by the TQ3WindowRectPickData data type.

window-rectangle pick object: A pick object that tests for closeness between a rectangle in a window and the screen projections of the objects in the model.

window space: See window coordinate system.

wireframe renderer: A renderer that creates line drawings of models. See also interactive renderer.

world coordinate system: The coordinate system that defines the locations of all geometric objects as they exist at rendering or picking time, with all applicable transforms acting on them. Also called the global coordinate system or the application coordinate system. Compare camera coordinate system, local coordinate system, window coordinate system.

world space: See world coordinate system.

world-space subdivision: A method of subdividing smooth curves and surfaces according to which the renderer subdivides a curve (or surface) into polylines (or polygons) whose sides have a world-space length that is at most as large as a given value. Compare constant subdivision, screen-space subdivision.

world-to-frustum transform: A transform that defines the relationship between the world coordinate system and the frustum coordinate system. Compare frustum-to- window transform, local-to-world transform.

wrap: For a shader effect, to replicate the entire effect across the mapped area. Compare clamp.

writing loop: A section of code in which all writing takes place. A writing loop begins with a call to the Q3View_StartWriting routine and should end when a call to Q3View_EndWriting returns some value other than kQ3ViewStatusRetraverse. A writing loop is a type of submitting loop. See also bounding loop, picking loop, rendering loop.

x axis: In Cartesian coordinates, the horizontal axis.

y axis: In Cartesian coordinates, the vertical axis.

yon plane: The clipping plane farthest away from the camera.

z axis: In Cartesian coordinates, the axis that represents depth.

zoom button: A button in the controller strip of a viewer object that, when clicked, puts the cursor into zooming mode. Subsequent dragging up or down in the picture area causes the camera's field of view to increase or decrease. Compare camera angle button, distance button, move button, rotate button.