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Paul Raymond Bouthellier* (pbouthe@pitt.edu), 504 East Main Street, University of Pittsburgh-Titusville, Titusville, PA 16354. *Using Quaternions and Rotations Matrices for Rotations in R^3 .*

First we shall compare the methods of using quaternions and rotation matrices for implementing rotations. An object, such as a wireframe cube, will be rotated about its axes in R^3 , using first quaternions and then rotation matrices to compare the efficiency of the two methods.

Secondly we will use rotation matrices and quaternions to create a camera which will move through R^3 and be allowed to rotate about its axes. The camera will allow the viewer to view a given scene from any position and orientation in R^3 . In creating such a camera, as quaternions can not deal with translations, movement through space will be accomplished via matrices and the rotations of the camera in space and about its axes will be accomplished by taking the product of the corresponding quaternions. Examples of all the concepts in this talk will be illustrated by interactive Flash programs. (Received August 18, 2009)