

Mathematics

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Abstract

This report is a short brief report about mathematics in game engineering. It shows why mathematics is important in game engineering. Important types of mathematics would be talked. In the end, we will see how to put mathematics good use in games.

Keywords: important mathematics

1 Why Mathematics important

Game can not leave mathematics, or it would not work at all. Nearly all games use coordinate system. Let's use racing game for example, mathematics is used to make cars move. Shadows of objects in game are calculated by mathematics, and objects are made by mathematics as well.

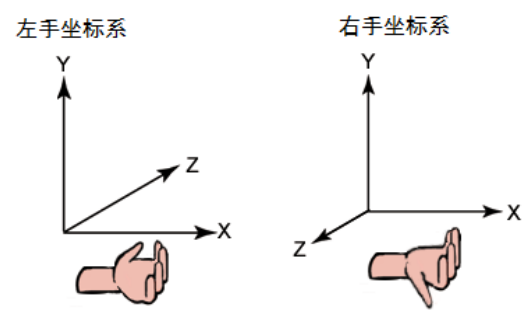


Figure1: left and right hand thumb coordinate system

2 Angles

An angle measures an amount of rotation in the plane. Variables for angles are often given the Greek letter θ . The most important units of measure are degrees ($^\circ$) and radians. Humans usually measure angles using degrees.

The circumference of a unit circle is 2π

radians, with π approximately equal to 3.14159265359. Therefore, 2π radians represents a complete revolution. Since $360^\circ = 2\pi$ rad, $180^\circ = \pi$ rad. To convert an angle from radians to degrees, we multiply by $180/\pi \approx 57.29578$ and to convert an angle from degrees to radians, we multiply by $\pi/180 \approx 0.01745329$.

3 Vectors

[1]The Vector class in Java can realize automatic growing array of objects; Vector in parts of the C++ standard template library, it is a versatile, able to operate a variety of data structures and algorithms of template classes and libraries.

Java.util.Vector provides a Vector so as to realize the function similar to a dynamic array class. In the Java language has no concept of pointer, but if we can correctly and flexibly use pointer and can greatly improve the quality of the program, such as the so-called "dynamic array" in C, C++ is generally implemented by pointer. In order to remedy this defect, Java provides a rich class library programmers to easy to use, one of which is the Vector class. In fact, flexible using array can also complete the function of the vector class, but the vector class provides a lot of methods greatly facilitate the use of the user

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Reference

[1]: GuiZhu, zhang ping, Chen ai-guo. Java object-oriented programming (jdk1.6) third edition: Beijing university of posts and telecommunications publishing house, 2005