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Two-pass 3D Object and Mouse Collision Detection*

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Abstract: Two-pass 3D Object Mouse Collision Detection

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Contents

1. Introduction

In computer graphics, the 3D models are projected to the 2D canvas pane of a GUI for real visualization. A mouse click event can get the point position in the 2D canvas pane. If we want to get the real 3D model's particular position projected to the 2D pixel coordinate, probably we have to un-project the 2D point. At least, it will involve depth test. Accurate computation may also involve ray-tracing, scene graph, octree, 3D sorting etc. We try to simply the burden by taking a different approach.

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2. How it works

First, we draw the colorful virtual world. Second pass, each object is draw in

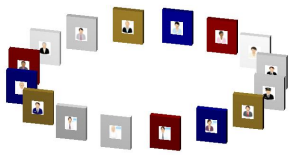

FIG 1. *First pass, the colorful virtual world .*

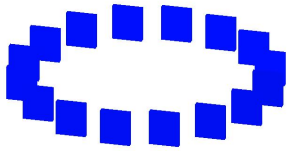

FIG 2. *Second pass, each object is draw in back groupd rendering .*

back groupd rendering. In Fig.(2), they may look like the same. But each of them is drawn with a unique mono-chrome color. We click the 2D pane, get a pixel position, the pixel position gives a unique color in format like [0,15,243,255], a 4 byte RGBA color. The color is mapped to a unique object ID.
This technology is applied in project Friends Torus.

3. Discussion

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This technology can be used to detect complex object, arbitary shape. Thus is convexity sorting, complex relationship, grouping. We don't do fortune-telling but probably many discrete algorithm again can be comptuted by floating processing unit (approximately). The fourth, you may use it to sieve something.

References