Harold: A World Made of Drawings

Harold is a kind of VR system to create interactively 3D scenes from 2D inputs. This VR system has the problem to reconstruct the 3D scenes interactively from new view point. It can be approached in two primary ways; geometric approach and image-based approach. In Harold it is made an attempt to find a middle ground, in that Harold creates a 3D model of the environment like Teddy, but populated by drawings, not 3D objects and it is like image-based methods. And It has billboard as primary geometry primitive.

Is primary geometry primitive, billboard effective to create a 3D model of the environment?

In this system, Harold, billboard is a plane with an image texture-mapped onto it as primary geometry primitive and it contains collections of planar strokes rather than textures. Can this billboard be proper solution to problem which is arising when 2D drawing is reconstructed to 3D models from novel view point? I don’t know why billboard can be one of solution. In this system most limitations are started in this “billboard”. Billboard is basically planar, so view point to see objects is very limited, and reconstructing 3D scenes from 2D drawing from other view point has a difficulty. If billboard is not modal symmetry or camera is not controlled, 3D scenes from arbitrary view point cannot be reconstructed properly.

I think billboard is one of core ideas in this system, and in VR system one of important things is reconstructing 3D interactively depending on view points. But billboard, itself is 2D drawing, plane, in this system it cannot overcome the limit of 2D. But I cannot deny that Harold has a powerful merit, quick visualization.

Present modeling system, I know, for example 3D MAX, is working with combining independent geometric objects or transforming. In this application users can work modeling with various view points; top, front, left, right, and perspective from any view points. However, in this system-Harold-can’t do this work (combining independent geometric objects or transforming or changing view points). Of course it can store strokes the screen and substitute other 2D drawings, but it cannot combine from 2 objects to one object or transforming objects. Because we cannot combine or transform primary geometry primitive, billboard.

Future Work?

Authors of this article said that their future work is to incorporate more techniques from other system, Sketch or Teddy or 3D curve system, and some features of 2D programs.

But I am not convinced that these future works can cover the present limitation. The author state in this article: “An ideal VR system would be capable of much expressiveness and interactivity”. The above-mentioned their future works can satisfy “expressiveness” by incorporating other techniques, but the issue of “interactivity” is still left. Because the limitation of primary geometry primitive-billboard- is not solved. But how about incorporate with pen-based system?