3D Computer Game with Correct Direction of Gravity for Augmented Realty

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Video Game Technology Moving Toward Augmented Reality with Flexible Interaction Each successive generation of video games raises the level of interactivity that the user experiences with the game world. A logical future path in gaming is in ‘augmented reality’ where a user can actually interact with virtual game pieces and appear to be in the game world. Two major problems are the need for physical forces, such as gravity, to act on the virtual objects similarly to how we would expect those forces to act in the real world; and letting the user view the world from an arbitrary viewpoint (i.e., not a fixed position).

Video Game Technology Allows Gravity to Act in a Direction Relative to the Players’ Physical Environment This technology is used to develop a video game where virtual objects seen from arbitrarily changing viewpoints appear to be acted upon by gravity and can be manipulated by simple physical props. For example, the technology has been demonstrated in a marble labyrinth game where the user manipulates a tracked handheld cardboard game board to control the trajectory of a virtual marble, maneuvering it past static and dynamic obstacles to reach a goal.

Applications:
- This technology can be applied to interactive games and physics simulations
- This technology can be used in many different types of video games.
  - In particular, a tracker can be somewhere other than head-worn to allow for more interaction with the virtual objects.
  - In physics simulations, the technology can be used to simulate environments where gravity is different than on Earth (i.e. as part of training for space missions).
- Educational software. For example, teaching students classical physics assisted by this technology.
- This technology can be part of the suite of technologies used by augmented reality devices

Advantages:
- Current technologies that allow the user to interact with a video game either use a hand-held display (i.e. an iPhone), or a fixed point camera, and therefore do not provide the flexible interaction allowed by this technology.
- This technology allows forces, such as gravity, to act in the correct direction relative to the physical environment in which the game is played.
- This invention is lower cost; no need to outfit gameboard with infrastructure; no need for tracking infrastructure in the environment other than the camera-sensor.

Patent Status: Patent Pending
Licensing Status: Available for Licensing and Sponsored Research Support

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