Gesture-driven Virtual Reality Games

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ABSTRACT

This disclosure describes virtual reality (VR) games in which a player can grab a virtual object with their (real) hands and propel the object into a virtual landscape. A pair of virtual hands is provided that mirror the movements of the user’s real hands. The movement of the virtual object can be controlled, e.g., it can be accelerated, decelerated, turned, twirled, made to shoot other objects, etc., with hand gestures.

KEYWORDS

- Gesture recognition
- Virtual reality (VR) games
- VR headset
- VR glasses
- Hand gesture
- Virtual landscape

BACKGROUND

Virtual reality (VR) games typically need game-control hardware, e.g., joysticks, etc., in addition to VR headsets.

DESCRIPTION

This disclosure describes virtual reality (VR) games in which a player can control virtual objects in a virtual landscape by gestures made using their (real) hands. A pair of virtual hands is provided that mirror the movements of the user’s real hands. Movements of the virtual object can
be controlled, e.g., it can be accelerated, decelerated, turned, twirled, made to shoot other objects, etc., with hand gestures.

The techniques of this disclosure are illustrated using screenshots of an example game in which the virtual object being propelled and controlled by gestures of the user’s hand is an airplane.

Fig. 1: A virtual landscape, and a virtual hand that mirrors movements of the user’s real hand to propel a virtual object

Fig. 1 illustrates an example virtual landscape (102) into which an example virtual object (104, an airplane) is controlled and propelled by a virtual hand (106). The virtual hand mirrors movements of the user’s real hand.
Fig. 2 illustrates twirling in place (202-208) of the virtual airplane, a form of control of the virtual object, using hand gestures. Hand gestures can also be similarly used to execute banks or tight turns of the virtual airplane. Such moves can be used, for example, as evasive maneuvers during attack by opposing players.
Fig. 3: Hand gestures to control a plane and grab it

Fig. 3 illustrates example hand gestures (302, 304) to control a plane (306) on the runway, and hand gestures (308) to lift the plane and propel it forward.
Fig. 4: Passing of objects between players on the same team

Fig. 4 illustrates the passing of objects (404), e.g., a flag, between two players (402, 408) using hand gestures (406). Hand gestures can similarly be used to shoot down opposing players in the VR game.
As illustrated in Fig. 5, per the techniques of this disclosure, hand gestures can be used to capture prizes, e.g., a medical chest, or other treasures in a VR game.
Fig. 6: Hand gestures to control a virtual object in flight

Fig. 6 illustrates example hand gestures (602a-b, 604a-b) that can be used to control a virtual object (606) in flight.

Upon grabbing a virtual object such as an airplane, the object can start moving forward at a consistent, steady speed without the user being required to make further hand gestures, e.g., speed changes can be effected by brake or boost gestures. To avoid VR sickness, gravity and/or momentum can be reduced or eliminated in the simulation during downward movements.

In this manner, the techniques of this disclosure enable players of a virtual game to grab a virtual object with their (real) hands and propel the object forward in virtual space in the direction of the user’s hand. The virtual object follows the hand’s position in the virtual
landscape, e.g., as the virtual object follows the moves, the turns, and the finger movements of real hands. Real hands and gestures are mirrored in the virtual landscape as virtual (or avatar) hands that act as a free-floating joystick or game-controller. Just as a user presses a button in a real game-controller to effect a move in the game, the user can press a virtual button with their real hands to effect the move. The movements of the virtual object are executed without game-controller hardware, and also without moving any part of the user’s body other than their hands.

**CONCLUSION**

This disclosure describes virtual reality (VR) games in which a player can grab a virtual object with their (real) hands and propel the object into a virtual landscape. A pair of virtual hands is provided that mirror the movements of the user’s real hands. The movements of the object can be controlled, e.g., it can be accelerated, decelerated, turned, twirled, made to shoot other objects, etc., with hand gestures.