GeFighters: an Experiment for Gesture-based Interaction Analysis in a Fighting Game

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Abstract

This paper presents GeFighters, a 3D fighting game that supports gesture based interaction. This application has been used to test and analyze gesture interaction in the context of games that need short and reliable response times. Some inherent aspects of the application have been analyzed, like the impact that interaction causes on frame renderization and response time related to the control of game characters. In order to implement the desired interaction, an input devices management platform, named CIDA, has been used.

Keywords: interaction, gesture recognition, games, GeFighters, CIDA

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1. Introduction

In the last decade, the innovative aspect of games has been decreasing gradually, which makes specific entertainment applications frequently repetitive. Similar types of games are published, differing only in history, visual aspects and interaction method used. The interaction is often reused from the paradigm of similar games. These games, targeting either consoles or personal computers, are controlled by joysticks, or simply by keyboard and mouse inputs. Some console games started capturing gestures through video processing techniques and as a result of the success obtained other developers followed this new approach as well.

It’s a fact that the use of gesture capture increases significantly user’s level of immersion, even if the visualization of the application is not done by HMDs (Head Mounted Displays) or CAVE (Cave Automatic Virtual Environment) systems. Consequently, this type of interaction acts like an extra attractive to different users, since it can be used in a large variety of games, like the ones related to sports, races, fights and simulations.

In order to attend the real-time needs of the applications, chosen techniques must correspond to speed and precision constraints, without degrading neither the gameplay nor the immersion.

This work makes use of the GeFighters (Gesture Fighters) application to test and analyze gesture interaction with games that need short and reliable response times. The application is a 3D fighting game whose interaction is based on the detection of fiducial markers (illustrated in Figure 1b), which provides information about the gesture performed. In this paper there will be analyzed some aspects inherent to the application, like the impact that interaction causes on frame renderization (variation on Frames Per Second (FPS) rate) and response time related to the control of game characters (capture delay due to image processing).

Section 2 presents games and applications in which the interaction is performed through the use of gestures, like the one proposed in this paper, as well as the technologies involved in the pattern capture process and user action interpretation. GeFighters is described in Section 3. The gesture interpretation and its mapping onto game commands, which is possible by the use of an interaction input devices abstraction layer, named