Abstract

Main purpose of this project is to create a multiplayer augmented reality chess game for mobile devices. In recent years, with the help of high usage of mobile applications, most of the traditional games turn into mobile applications on various platforms. Since there is an opportunity to mix virtual reality and real world, this project demonstrates the Augmented Reality technology on a traditional board game. The Augmented Reality Chess Game offers user to play multiplayer chess game and interact with virtual objects. The touch screen or buttons on the phone are used to control the game. Board of the game replaces the 2D or 3D virtual boards. It is even possible to move pieces using smart phones accelerometer. Virtual buttons on the target are also used for interaction with the chess pieces.

Application Functionalities

- Augmented Reality View on reality
- Multiplayer gaming features in local network area
- Virtual object interaction
- Ability of touching and dragging objects with device touch screen
- Ability of dragging objects with virtual buttons
- Android & iOS support
- Peer 2 peer connections on cross-platforms

General Structure

This project is created using Unity 3D game engine and Vuforia, which is used to detect the image targets and build 3D environments on the target. When the application is running, the Unity Game Engine and the Vuforia are always running on the background. Camera should be on all the time. A network protocol is also run for multiplayer gaming.

Results

The results of CPU and Memory usage tests show that the power consumption of this application is two times more of a similar concept non-AR 3D game. Using camera feature during the entire game, rendering the 3D objects using the game engine and handling network operations for a realtime multiplayer environment are the reasons for this high power consumption. Network traffic test also shows us that the application generates only a small amount of data for multiplayer gaming.

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