PlayBricks III: Integrating Architectural Style with Desktop Play Bricks App

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Introduction

Due to diversity, a phenomenon called ”hybrid heritages” has been introduced. This results in the mix-up of multiple heritages and the loss of authentic history. One of the best ways to preserve a culture is to teach the young generations about its architecture. The aim behind the PlayBricks application is to introduce a simple gamified learning experience to its young users. The users should be able to learn more about the different styles of the Islamic architecture all while enjoying themselves.

Literature Review

The aim of Mendes et al.[6] was to simplify the manipulation of 3D objects in 3D modeling softwares so that they could be suitable for entertainment without the users having to know how to use Computer Aided Design softwares also known as CAD. A 3D interactive bimanual and multi-touch tabletop LEGO application was created. First, four different pre-existing LEGO applications were compared against each other; LEGO Digital Designer, Mike’s LEGO CAD, LeoCAD and LSketchIt. It was described that in LEGO Digital Designer, the translation of a brick happens only in the grid plane, to which it adapts. Rotation occurs on two axes, which are perspective-dependent, so one must decide which camera position is best in order to achieve the desired rotation effect. As for Mike’s LEGO CAD, due to the CAD-based nature, it is not suitable for all users, especially those unfamiliar with CAD paradigms. Consequently, building virtual LEGO models becomes more challenging. LeoCAD, similar to Mike’s LEGO CAD, utilizes LDraw and the CAD paradigm, however, it allows manipulation in both perspective and orthogonal views. From an interaction standpoint, LeoCAD requires mode switching via buttons on its interface. Finally, LSketchIt [25] is based on LeoCAD and shares many of its features, although it retrieves and selects the brick by drawing a sketched version of it. The system presents suggestions based on the brick outline (sketch) and allows the user to modify the brick, refreshing the suggestions based on that modification. The new application developed was called LTouchIt and it had more natural user interactions. For instance, to move a brick, the user would “pick” it meaning that they would touch and drag it. If the user wants to change the transition plane, they would tap once on the screen to switch between horizontal and vertical planes. Finally for object rotation, they would use virtual handles. Results indicate that the interactive application is competitive, but it also provides a hands-on experience Furthermore, reviewing user comments and questionnaires, it was concluded that most participants found it easy to use.

Methodology

PlayBricks is a serious game which means it is a game designed to add to the excitement of education. An overview of the implementation process is demonstrated in fig. 1. PlayBricks was designed as a first person game as this allows the users to be more engaged in the gameplay. Moreover, the UI of the game is created to be accessible, easy and intuitive with only a few collapsible menus. The main controls of the application are the mouse and keyboard. Some screenshots of the different scenes and block colors are shown in fig 2.

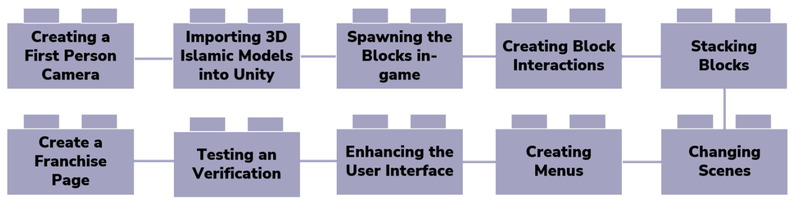

Fig. 1: Block Diagram of the Implementation process

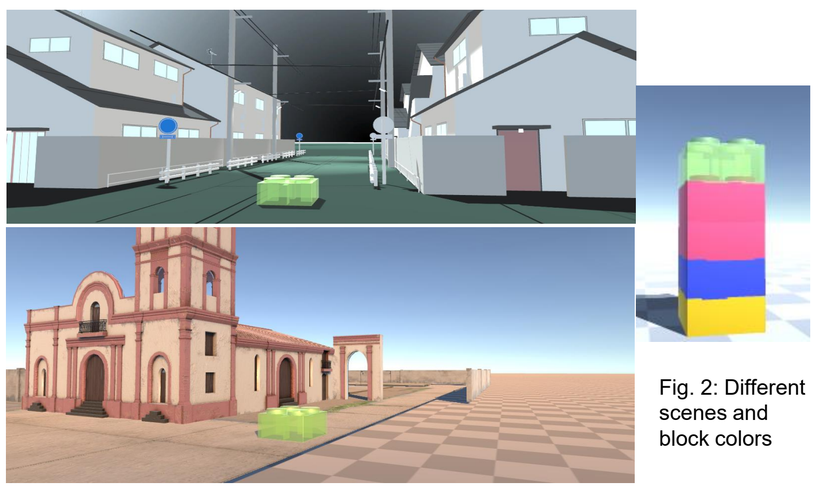

Fig. 2: Different scenes and block colors

Results

A The current features available include:

- An intuitive UI with menus
- The ability to spawn multiple bricks and change their color
- The ability to change scenes
- The ability to stack blocks and create Islamic inspired buildings

B

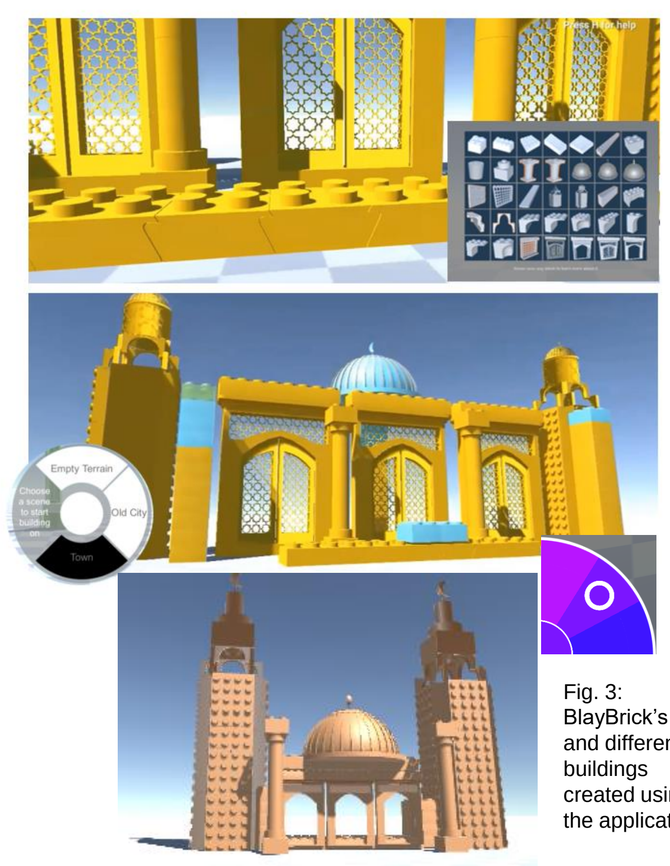

Fig. 3: BlayBrick’s UI and different buildings created using the application

Conclusion

PlayBricks aimed to fill a significant gap in the game market as to our best of knowledge no other game or application was designed in order to help in the Islamic culture preservation. PlayBricks serves as an efficient and intuitive educational tool.

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