Games as Design Tools: Earthquake Loading

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Abstract **– Games are the primary source of entertainment in the digital world; I like to refer as cyber drug. Using games for educational purposes has been a long followed tradition but using them as design tools has never been the case. Earthquake loading is a game that follows the concept of game development as design tools to provide an entertaining source of design implementation. It showcases the effects of earthquake on different objects with different meshes. The concept of games as design tools provides a new direction of game development.**

Keywords – Games, design, design tools, digital model, earthquake simulation, game development, Unity 3D, scripting.

INTRODUCTION

Games – the platform of inspiration, education, simulation, creativity, interactivity and many more useful roles has been among us from as early as 2600 BC. Every individual plays games regardless of their age. The genre may be different for every person but so is the case in theatre; everyone has their own taste.

Design is a versatile field of creativity where one may express their mind map on paper. Games have always been a gateway to provide a way out from stress and work except in some cases where they serve well for educational purposes. But never before, have they been implemented to serve as a design tool.

The main objective of the research was to dynamically link gaming with design providing an entertaining and digital platform. As with every new technology or direction, evolution is the key to its success and implementing games as design tools is a step forward to achieve success in a new domain of technology applications.

The game is a digital model of earthquake simulation on objects with different meshes. It involves multiple forces on the objects with variable magnitude of each force to understand the effects dynamically. The software used for the implementation was Unity 3D which is an open-source development platform for games using graphical objects and scripting techniques in C#, JavaScript and Boo (Python inspired PL).

At the elementary level, the study of earthquakes is done on mechanical models since the software is expensive, so providing this model digitally amalgamated with games should ease up the dilemma of choice.

The design of the game follows three objects with different meshes, each loaded on a separate base. The base experiences vibrations whose magnitude is provided by the user dynamically and the effects of the vibrations can be viewed on a specific object or all objects simultaneously. The game also points to the different effects of earthquakes on differently shaped objects.

SOFTWARE AND METHODS

The implementation of the game is done in Unity 3D which is a cross-platform game creation system developed by Unity Technologies, including a game engine and integrated development environment (IDE). The following image sheds light on the environment of the game.
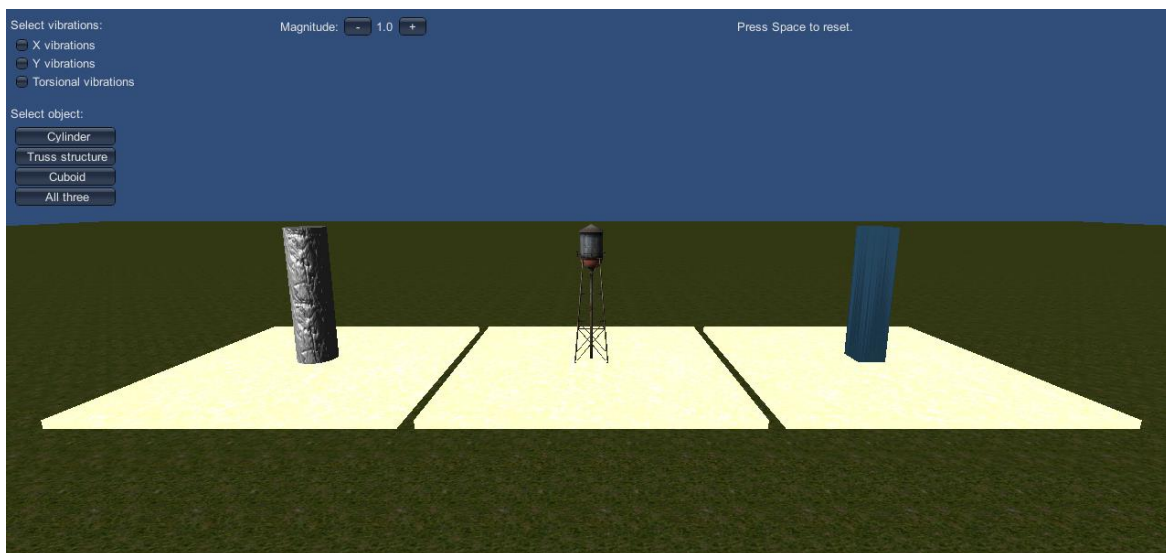
Implementation available at http://dm.amidstsky.com/games/earthquake/

All the floors are separate for each object and are associated with a script written in JavaScript programming language to create the effects of earthquake when the vibrations are checked true (top left of the screen). The floors vibrate with the frequency of the set magnitude (top of the screen). The camera view is selected by the button options (left of the screen) and the whole scenario can be reset by the Spacebar.

The game incorporates use of event handlers, mathematical functions, collision detection between different game objects, physics (gravity, mass etc.) and various forms of textures and meshes of game objects and environment.

WHY GAMES?

Why develop a game for design tools instead of software? The answer is very simple indeed. The basic principle of development is to bridge the gap between people and effort. A software includes multiple complex tools which are hard to understand without a proper documentation while gaming is an art which a person learns by exploring and does not involve complex directions to implement a design.

If the basic principle of development is simple, then gaming is the perfect way to objectify that idea since it will attract the attention of a larger crowd with respect to the software implementation of the same and it will keep the users engaged in the theoretical aspects of the design by providing a digitally carved platform for the same.

HORIZON OF DEVELOPMENT

The domain for development of design tools via games is immense. Any design tool with a logically structured set of operations can be transformed into a gaming environment by a developer adept in creativity and bearing a broad mindset.

ACKNOWLEGEMENT

BIBLIOGRAPHY

1. Unity 3D Documentation

   http://docs.unity3d.com/Manual/

2. Lisa Wald – The Science of Earthquakes

   http://earthquake.usgs.gov/learn/kids/eqscience.php