Code Assessment in a 3D Virtual Office

Mehmet NAMIDURU - Merve KAYMAK
Advisor: Asst. Prof. Dr. Murat YILMAZ, Department of Computer Engineering, Çankaya University
Co-Advisor: Dr. Eray TÜZÜN, HAVELSAN A.Ş.
Virtual Reality Laboratory, Çankaya University.

Abstract

The Code Assessment Simulation is an educational simulation program presents "Code Review" and "Monkey Testing" in a virtual office environment to train novice software practitioners who has joined a software team recently. The goal is to decrease education costs for teaching code review and monkey testing concepts.
Keywords: Educational simulation, Code review, software testing

Introduction

Havelsan has used *code review* process while developing their projects which means the act of programmers to check each other's code for mistake. However, newly graduated software engineers do not practice code reviewing and do not know its importance. Another term for verification the code is *monkey testing* that the user tests the application by providing random inputs and checking the behavior. Training on these concepts not only takes time but also costs, so an interactive 3D office environment which is populated with the office objects and staff with animations built for hands-on training is essential. The questions and information can be taken from virtual staff (i.e. the non-playable characters in the office) the content can be enriched.

Solution

Flow of events in 3-D office environment (see *Figure. 3*) which is simulated with **Unity** 3D Game Engine is as follows: At first, a piece of code is provided to participant to review the code and find the errors (e.g. compiler, logic and runtime errors) in the code. Secondly, participant will build the code. Until participant finds all the compiler errors, code reviewing process will be continued. The last step is "*monkey testing*". An UI corresponds to the given code will be provided to the participant for testing. Participant control the features of the code, and report undesirable functionalities. At the end of these 3 phases, participant has to take a quiz in for evaluation his/her gains. Informative NPC's in the simulation were designed with **Adobe Fuse** and animated with **Mixamo**. Participant should take into account the time and budget constraints.

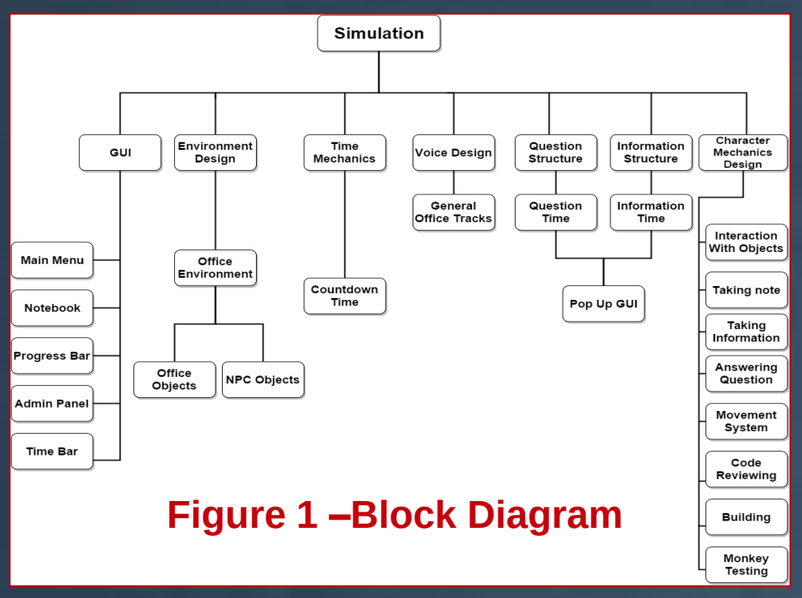

Figure 1 –Block Diagram

Screenshots

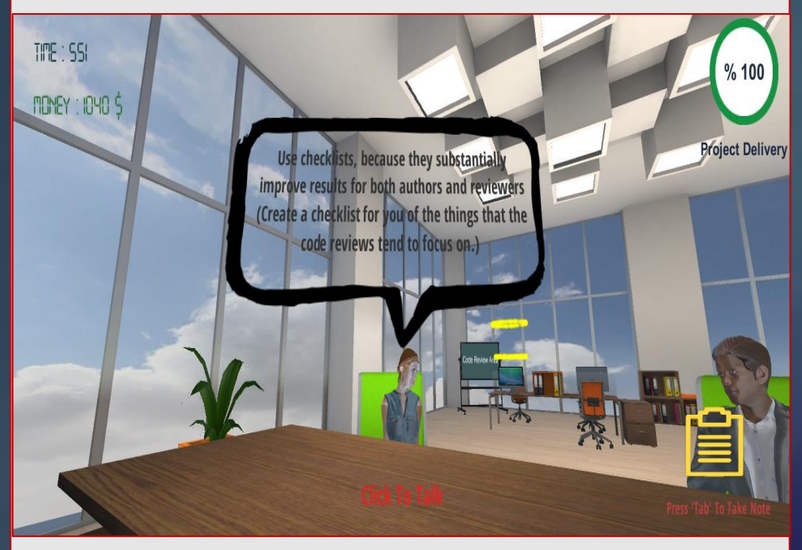

Figure 2 – NPC Interaction

Figure 3 – Code Review Area

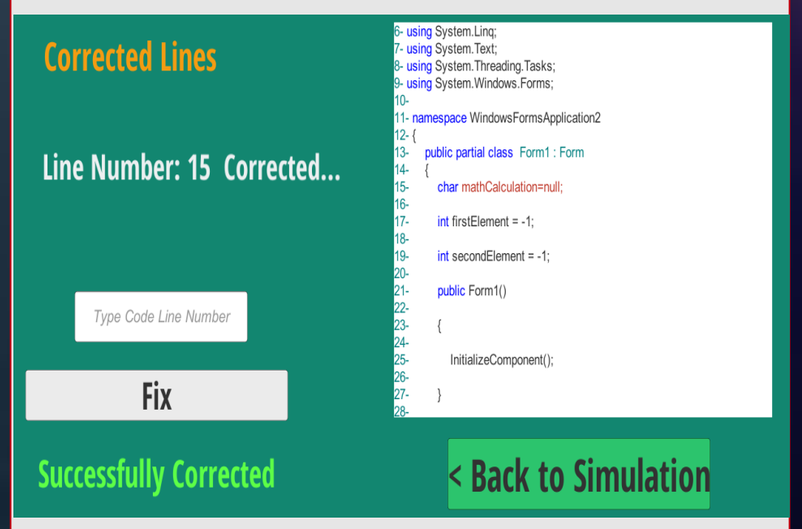

Figure 4 – Code Review part

Company Info

This project has been coordinated with *HAVELSAN A.Ş*. This company works on defense industry particularly. Their areas of expertise are:
1. Command Control &Combat Systems
2. Information & Security Technologies
3. Cyber Security & Cloud Computing Technologies
4. Simulation, Training & Test Systems

Results & Conclusion

In order to develop our project, we learned Unity 3D Game Engine programming logic, state machines for animation, animation types, and character creation with Adobe Fuse. We also researched on code review and monkey testing processes, we realized the significance of them and we tried to learn these concepts. Another acquisition was how the documentation should be done of a software project that over changes. Additionally, working with a principal engineer from industry who is our co-advisor Eray TÜZÜN helps us to gain a different point of view towards the problems. As a result, an educative simulation project has completed to make participants practice. Code Reviewing and Monkey Testing by highlighting time and budget constraints.

Acknowledgement

We would like to express our special appreciation to our advisor: Assist. Prof. Dr. **Murat YILMAZ** for his valuable suggestions and supports. Special thanks should be also given to our co-advisor: Dr. **Eray TÜZÜN** from *HAVELSAN* A.Ş. for his professional guidance and constructive recommendations.