Immersive Quiz for Spanish Learners

A Manuscript

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by

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We recommend acceptance of this manuscript in partial fulfillment of this candidate's requirements for the degree of Master of Software Engineering in Computer Science. The candidate has completed the oral examination requirement of the capstone project for the degree.

Prof. Kasi Periyasamy Examination Committee Chairperson	Date
Prof. Steven Senger Examination Committee Member	Date
Prof. Kenny Hunt Examination Committee Member	Date

Abstract

Austin Klum, J., "Immersive Quiz for Spanish Learners," Master of Software Engineering, May 2022, (Elliot Forbes, Ph.D.).

This manuscript describes the development of a quiz creation tool combined with a virtual reality component to provide an immersive quiz taking experience for Spanish learners. The quizzes also have an orienteering course aspect as well, where each quiz is comprised of multiple timed locations where all questions must be completed correctly before continuing onto the next location.

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I would like to express my thanks to the Department of Computer Science at the University of Wisconsin–La Crosse for providing the learning materials and computing environment for my project.

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Glossary

ANTLR

ANother Tool for Language Recognition. Successor to the Purdue Compiler Construction Tool Set (PCCTS). Currently maintained by Terence Parr.

BYACC/J

An extension of the Berkeley YACC-compatible parser generator. Can generate both C/C++ and Java parsers.

CUP

Constructor of Useful Parsers. A LALR parser generator written in Java.

IEEE

Institute of Electrical and Electronics Engineering. The world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity.

JFlex

A scanner generator for Java.

LALR

Look-Ahead Left to Right. LALR parsing algorithm, introduced by Frank DeRemer, provides the same high performance of LR parsing algorithm, introduced by Donald Knuth, but is more efficient in term of size.

LaTeX

LaTeX is a document markup language and document preparation systems for the TeX typesetting program.

SUT

System Under Test. This term refers to a system being tested for correct operation.

1. Introduction

1.1. Overview

The rise of globalism has prompted people of different cultures to increasingly work together and interact with one another. Thus, understanding other cultures and languages will become ever more important. Often times this can be hard to teach, especially in a classroom. Virtual reality can be used as a means to bridge the gap between real-world understanding and classroom knowledge. Virtual reality allows for a more immersive experience. A more immersive experience is a more effective way to engage students and promote learning.

In 2017-2018 there was an initial virtual reality project conducted by Claire Mitchell to take tours of Medellin, Colombia. This project was a success and discussions were made to expand on this initial success. In 2019, there was a grant proposal for development of a new project to further enhance experiential learning. As virtual reality is a vanguard area of development such resources don't exist yet and would require new development. The proposal also requested an orienteering component to be included. Orienteering is an activity where participants "navigate between checkpoints along an unfamiliar course" (Merriam-Webster). The primary purpose of adding an orienteering aspect is to add to the depth of cultural understanding, as orienteering requires the participants to have a more active role in the experience.

2. Requirements

2.1. Overview

The following section is on the requirements of the project and development methodology.

2.2. Development Methodology

The stakeholders for this project is the project owner and sponsor, project advisor, and developer, Claire Mitchell, Elliot Forbes, and Austin Klum respectively. The end users are the students using the virtual reality tool for their learning and the instructors using the quiz management tool for assessment of student's comprehension of classroom material.
The chosen development methodology for a project is an early and influential decision made that alters the course of development. As this was a solo-developer, web, and virtual reality project with a busy project sponsor, the decision was made to make use of an iterative agile methodology. Traditional methodlogy follows the waterfall approach, The developer also made use of a KanBan board to help keep organized.

2.3. Point 2

This gives Point 2

3. Design

3.1. Overview

This gives a brief overview of this section.

3.2. Point 1

This subsection gives a great deal of precise description supporting point 1. For example,

3.3. Point 2

This gives Point 2

4. Testing

4.1. Overview

This gives a brief overview of this section.

4.2. Point 1

This subsection gives a great deal of precise description supporting point 1. For example,

4.3. Point 2

This gives Point 2

4.4. Point 3

This gives Point 3

5. Conclusion

5.1. Overview

This gives a brief overview of this section.

5.2. Point 1

This subsection gives a great deal of precise description supporting point 1. For example,

5.3. Point 2

This gives Point 2

6. Bibliography

TODO

Make these actual references

Orienteering

https://www.merriam-webster.com/dictionary/orienteering

7. Appendices