CSCB58 Project File: Summer 2017

Team Member A

-------------

First Name: Kasra

Last Name: Rahmani

Student Number: 1003536202

UofT E-mail Address: kasra.rahmani@mail.utoronto.ca

Team Member B

-------------

First Name: Andrei

Last Name: Grumazescu

Student Number: 1003341788

UofT E-mail Address: andrei.grumazescu@mail.utoronto.ca

Team Member C

-------------

First Name: Christopher

Last Name: Chow

Student Number: 1001591672

UofT E-mail Address: chrisa.chow@mail.utoronto.ca

Team Member D (Optional)

-------------

First Name: N/A

Last Name: N/A

Student Number: N/A

UofT E-mail Address: NA

Project Details

---------------

Project Title: Diffuse It!

Project Description:

Our project is inspired from the game “keep talking and nobody explodes.” The idea of the game is that there is a bomb that will go off in a few minutes and must be diffused, however only one person is able to see it and they must describe it to the other players who will use a detailed manual which will give instructions on how to diffuse each particular bomb. The player diffusing cannot see the manual and the players seeing the manual cannot see the bomb.

Our idea is to have the DE2 board act as the bomb and depending on what they see on the board and screen, the instructions to diffuse it will be different. We plan to have randomized bomb scenarios that players can play through as well as different settings which will affect the difficulty of each puzzle as well as how long or short the timer for the bomb is. We will also have a physical manual that the players not physically defusing the bomb will refer to.

The game starts when the DE2 board is turned on. The “main menu” asks the players to select a difficulty, after that is chosen there will be a few seconds of pre game preparation before the bomb is revealed. The bomb will have a multitude of different LEDs and HEX segments to serve as distinct qualities which the diffuser must describe to the other players. If the timer runs out before the bomb is defused or the players cause the bomb to detonate prematurely, the board will enter a game over screen then return back to the main menu. If the players defuse the bomb, the board will enter a celebratory state which will have the board flashing a multitude of colours, a victory screen. The user can exit this by pressing a button to go back to the main menu.

Video URL:

Inspiration: https://www.youtube.com/watch?v=5BhHkvHcUfo

Example: https://www.youtube.com/watch?v=wwOkH8rChqU

Code URL (please upload a copy of this file to your repository at the end of the project as well, it will

serve as a useful resource for future development): https://github.com/Kasrahmani/DiffuseIt

Proposal

--------

What do you plan to have completed by the end of the first lab session?:

We plan to have completed by this point at least five puzzle modules, and have them fully functional. We should also have a detailed plan moving forward to help split the work and make sure we’re all on the same page. In ensuring our plan is carried forward and is organized, we are using Slack as the main form of communication as well as handling any documented rough work, designs, and schedules. We plan on having standup meetings semiweekly to ensure that we stay on task and know exactly what is happening in different areas of the project.

We also plan to have booked at least one session in the Makerspace outside of lab time where we are all available. The design proposals for the manual will be finalized by this point as well as designs for the physical details of each puzzle/bomb on the DE2 board should be finalized at this point.

What do you plan to have completed by the end of the second lab session?:

By this point we plan to have our top level roughly complete, meaning we should be able to start testing the project and playing through puzzles, as well as noting successes and failures. All puzzles should be tested and bug free by the end of the lab.

We will sort the puzzles in varying versions of difficulty by this lab and have an idea of which puzzle will be used for which mode; easy, medium, and hard. We will have the main menu finished at this point. The manual should be created with a cover and final design to look professional. At least one complete playthrough should be possible without any errors.

What do you plan to have completed by the end of the third lab session?:

We plan to be relatively finished by this point, time will be spent mainly for improving the top level, as well as implementing new puzzles and final testing. Since they are to be chosen at random in the final product this will involve modular testing and will not greatly complicate testing of the overall project. Any last minute debugging will be conducted in the third lab.

If we manage to have extra time, we plan to add a local high score list which will keep the fastest diffusal time for the current session (as long as the board has stayed on) stored and viewable from the main menu.

What is your backup plan if things do not work out as planned?

Firstly, we plan to have our code tested and ready for class as to not waste time with the DE2 boards. If we find we are lacking in time we do not need a great variety of puzzles as the puzzles themselves contain elements that are different between uses, and we can spend more time finishing what we are lacking. We can create one more involved puzzle rather than multiple puzzles so we can have some playability with the game at least. If more board time is needed for testing, we will seek to book the DE2 board in the makerspace.

What hardware will you need beyond the DE2 board

Screen to draw to from DE2 board, necessary wires.

Motivations

-----------

How does this project relate to the material covered in CSCB58?:

The puzzles to be solved to diffuse the bomb are all each large circuits, modules that require very specific inputs. Some of the puzzles concern logic and binary arithmetic problems, reading a finite state machine, and understanding of circuits such as flip-flops and latches. The project itself involves the use of the seven segment LEDS as well as the regular leds, switches, keys, and the internal clock. The project itself uses the board to its maximum potential by integrating all physical intractability and logic we used in the course, as well as using the board itself as a physical representation of the bomb.

Why is this project interesting/cool (for CSCB58 students, and for non CSCB58 students?):

As mentioned above this board uses the DE2 board to its full potential, both as a cool piece of hardware and software, but also as the embodiment of the bomb which the player is trying to diffuse with his teammates. The final product is a fun game that rewards understanding of the course material, and in general is very exciting to interact with.

Not only the DE2 board, but every lab that we have done up to this point will somehow be incorporated within this project; the hex displays, the control and datapath modules, ALUs, RAM and registers, and working as a group to problem solve.

Why did you personally choose this project?:

We as a group agreed that we wanted to do something that wasn’t boring and that used the majority of the content covered in the course. Through the use of puzzles to solve by interacting with the board, we can cover a very large amount of different topics taught in the course. This will allow us to demonstrate both our understanding of course concepts and hardware development in Verilog. To our first regard, what is less boring than a tension filled bomb defusal?

Additionally, based on the the video inspirations, we felt the previous attempts in developing this game were still capable of improvement. We hope to demonstrate the concepts of this course and our understanding by further improving the concepts in the listed videos (please note, at this stage, we are only improving the concept of the game and not leveraging any past modules or work).

Attributions

------------

Provide a complete list of any external resources your project used (attributions should also be included in your

code).

Updates

-------