301 Proposal

Question: What actions can developers take to popularise Virtual Reality?

For this project, I plan to create a game in Virtual Reality that will serve as an example of the capabilities of VR as a gaming platform.

Introduction

VR is a computer generated place or event that simulates an experience, by using video and audio to simulate the area. The simulated events and applications of these events can vary widely, ranging from a realistic simulation, a wide range of video games from different genres, such as action games such as Gorn, by Free Lives, and puzzle games such as Tetris Effect by Monstars Inc and Resonair. Virtual Reality will potentially also be used for training, and medical purposes. In regards to the medical benefits, topographical disorientation is common in victims of strokes, but according to Cogné, Violleau, Klinger, and Joseph (2017), Virtual Reality could be used in rehabilitation of these victims. In regards to training, according to Aïm, Lonjon, Hannouche, and Nizard (2015), Virtual Reality can be used in training for orthopaedic surgery. These makes Virtual Reality a potentially very useful field to develop, due to the many positive medical implications that could result in benefits for many medical patients, and training in other fields such as industrial work.

Problems

Virtual Reality is a growing platform with great potential, but does not seem to have taken off completely, for several possible reasons. These may include:

* A lack in many available Virtual Reality games.
* The significant cost of Virtual Reality headsets.
* A lack of successful marketing to reach a wide audience.

The first problem is a lack of available Virtual Reality games. Virtual Reality games are a more niche market compared to others, due to the requirement of a Virtual Reality headset, and as a result less companies and developers are willing to develop Virtual Reality games due to risk of low sales as a result of the lower amount of potential customers with Virtual Reality headsets. I believe that as Virtual Reality becomes more popular and mainstream, developers creating Virtual Reality games will gradually become more common, due to the growing market. This can be helped by developers both big and small creating more Virtual Reality games to feed the market. The lack of games is an intriguing problem to solve because as a result a wider variety of Virtual Reality games will become available to explore, and will make the Virtual Reality market more accessible to consumers due to the wider variety of games to choose from. Another possible solution is to consider developing in a range of fields other than video games. For example, developers could delve into the medical applications of Virtual Reality. For example, medical purposes such as rehabilitation and treatment of conditions such as motion sickness could be a worthwhile venture for developers because it would benefit medical science and the developers image. It would also improve the image of Virtual Reality to consumers by demonstrating the possible benefits of the platform to a wide range of people, this would make it more likely for consumers to invest in Virtual Reality equipment.

Another problem is the significant cost of Virtual Reality headsets. The large price of Virtual Reality headsets is likely a result of Virtual Reality gaming being a relatively new market, and as many headsets are charge at a premium price. I believe that as more companies enter the market with Virtual Reality headsets, the prices or Virtual Reality headsets will lower due to the competition, making Virtual Reality headsets more affordable, and making the production of Virtual Reality games more realistic for developers as a result. The high price of Virtual Reality headsets is an interesting problem to solve because different companies will enter the market with new Virtual Reality headsets to take advantage of Virtual Reality becoming more mainstream, which in turn will give consumers a much wider variety of Virtual Reality headsets, along with accessories including controllers and trackers.

Another possible problem is a lack of marketing for Virtual Reality gaming. A possible lack of marketing towards potential consumers could be a cause of a relatively niche market of consumers in Virtual Reality in comparison to normal games. This could be solved by increasing marketing for Virtual Reality in places such as shopping malls, tech stores and video game stores. This is an interesting problem to solve because increased marketing for Virtual Reality will mean that a wider audience for Virtual Reality will become available for develops and publishers to market and sell to, allowing them to experiment with a wider range of genres and types of games. Another potential solution to this problem is to market specific benefits of Virtual Reality, an example of this is the possible medical benefits of Virtual Reality. By demonstrating the medical benefits of Virtual Reality to potential consumers such as rehabilitation and training, marketers can show consumers that Virtual Reality is a market worth investing in, not just for functions such as video games, but for the many potential medical benefits as well, potentially allowing Virtual Reality to reach a much wider audience, allowing developers to delve into the realm of Virtual Reality used for medical purposes.

For my project, I will attempt to demonstrate that Virtual Reality gaming can be a valid field for dvelopers in invest in by creating a Virtual Reality game by using the Unreal Engine.

Learning Outcome

For this project, I plan to create the Virtual Reality game using Unreal Engine, using the Blueprint system to script the functions of the game. Because of this, I will need to study the Blueprint system in order to create the variety of systems I plan to create. Thankfully, there are many resources available online, most prominently Unreal’s own website (<https://docs.unrealengine.com/en-us/Engine/Blueprints/GettingStarted>) and YouTube channel (<https://www.youtube.com/channel/UCBobmJyzsJ6Ll7UbfhI4iwQ>), both of which contain extensive guides and tutorials for utilising Blueprints. This will be highly valuable during the production of the game, and can be referred to at any time during production.

I plan to use Maya to create the models for the game, and will need to understand Maya to do so. Autodesk has a large database of guides for using Maya, which will be helpful during production (https://knowledge.autodesk.com/support/maya/learn-explore/caas/CloudHelp/cloudhelp/2015/ENU/Maya/files/GUID-7D22C4F0-F9AA-4F75-AD4A-18C556069415-htm.html). However, modelling is not the primary concern of the project, meaning that Blueprints and functionality will take priority. Still, learning Maya will be useful for this and future projects.

Since Virtual Reality is a relatively new field for me, so despite much of what I need being available within Unreal’s pre-existing levels and blueprints, I will need to learn more about Virtual Reality in order for the project to succeed. For this, there are many resources (and growing) available online for Virtual Reality development in Unreal, for example Unreal’s own website again (<https://docs.unrealengine.com/en-us/Platforms/VR>). This will make it easier for me to understand Virtual Reality development, which will be useful for this and future projects.

Schedule

The game will be made using unreal engine, for the HTC Vive, which uses controllers that allow the player to perform precise actions, which will be important for puzzle games. The player will be able to move their head, and the Vive will reflect this in the game by matching the player characters head movements, allowing the player to navigate and look around the game area. My Virtual Reality game will be a playground style game, in which the player is placed in a room containing various puzzles and gadgets. The player will be awarded points for completing these puzzles; the player’s goal is to complete as many puzzles as possible. This will be done using the Vive’s controller, simulating a pair of hands, which will allow the player to pick up and move objects, which will be required for the player to complete the puzzles. The current planned puzzles for the game include:

* A lever puzzle, in which the player will have to pull the levers in a certain order to win, which will be determined by a randomised series of lights next to each lever that will quickly flash when a start button is pressed. If the player fails, the start button must be pressed for another attempt to be made, at which point another random combination of lights will flash.
* A minigame where the player must throw balls at moving targets. The targets will move in several different directions, and around or behind objects to complicate the game for the player. The balls will land in a tray that will lead back to the player, similar to a Skeeball machine. The player must hit a certain number of targets before the time limit is reached.
* A puzzle game where to player will have to rotate and move pieces to fit them together. When the puzzle is pieced together correctly, the player is awarded a point. There could potentially be multiple variations of this minigame, with different difficulty level.

As development progresses, these minigames can potentially be expanded or improved upon, and new minigames or levels could be added as well.

In the first three weeks, the proposal will be produced. This contains the research question, the outline and goals of the project, and details the planned features of the game. The proposal can change as development progresses to facilitate changes in development. These weeks will also be used for the beginning stages of the game, these being researching the necessary resources for developing the game, such modelling using Autodesk Maya, and developing for Virtual Reality in the Unreal Engine using the Blueprint system. This can also be used for setting up the basic skeleton for the game.

During weeks four and five, the first Prototype Build will be developed. This build will be functional, and will demonstrate several of the features as seen in the proposal, such as the player’s ability to interact with the objects and gadgets, and function such as overlap triggers. The build will also come with a build report. This report will cover the current status of development, and will use screenshots to demonstrate features and any issues with the development process. The report will also cover any changes in development, such as features being added or removed, as well as any difficulty.

During the last three week, the second Prototype Build will be developed. This build will be more compelte and refined than the previous build, and will again come with a report that will cover the development process much like the report of the previous build. This build will also contain a Design Document. The Design Document will include a mockup, an interface design, and an interaction design. These will demonstrate and explain the design choices made during the game’s development.

Conclusion

Overall, I believe that developers can delve into Virtual Reality as a platform for videogames, and hope that my game will be an example.

References

Influence of non-contextual auditory stimuli on navigation in a Virtual Reality context involving executive functions among patients after stroke

(Mélanie Cogné, Marie-Hélène Violleau, Evelyne Klinger, Pierre-Alain Joseph)

https://www.sciencedirect.com/science/article/pii/S1877065718300071

Effectiveness of Virtual Reality Training in Orthopaedic Surgery

(Florence Aïm M.D., Guillaume Lonjon M.D., Didier Hannouche M.D. Ph.D., Rémy Nizard M.D., Ph.D.)

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