FYP Project Proposal Form 2021/2022

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Programme Code: DT211C / TU857	
Project Title: Wild-Ireland – Educational game for Irish wildlife	

Summary (approximately 200 words):

The main goal of this project is to be used as an educational tool to teach kids and people of all ages about wildlife in Ireland and improve their knowledge of the various species of animals. I plan to accomplish this by creating a 3D game in unity that allows kids to have a more interactive and enjoyable learning experience which facilitates the way kids learn about Irish wildlife.

This Game will allow the user to move freely throughout a procedurally generated landscape which consists of real Irish wildlife such as plants, trees and common species of animals. The player will be able to move with a first person view of the environment and they will be able to explore the terrain as they please. Upon finding different wildlife they will be able to inspect the wildlife and gather information and learn through the game.
There will be two landscapes in which the user will be able to explore, rural and urban wildlife will be divided into these two landscapes. Models and assets for rural landscapes will be obtained by scanning real life objects from Irish landscapes. For the urban landscapes this method will also be used as well as using satellite images to generate cities and buildings. I plan to achieve this by using unity and blender.
The animals in this game will use machine learning and AI to maneuver and interact with their surrounding environment and will also be placed procedurally throughout the environment. The Animals will also react to the player using AI.

Once the player has gathered info about a certain life form which will consist of videos, pictures and text. They will be able to store this information in a virtual journal which they will be able to view throughout the game. Quizzes will be available to the user who wish to test their knowledge on what they have learnt.

The design of this game will be influenced by HCI principles to make it suitable for children to use and understand.

Sometimes learning through textbooks can be boring and hard to attract the attention of young kids.
The idea is that the kids will be able to access this game by downloading it through the internet. I plan to launch this project and hopefully it will be used in primary schools and educational institutions all throughout Ireland.

Background (and References)

Whilst thinking about my time in primary school I recall finding it hard to concentrate and to take in information about certain topics whilst reading only from a textbook. Although I was able to learn this way, my attention span was not long enough to keep focused on reading from the textbooks and learning this way for long periods of time. Hence, why I have thought of a more engaging and exciting way to learn about wildlife.
During my research I have found academic papers related to my topic.

Ilaria Caponetto. ***Aspects of the integration of games into educational processes.***

This paper researches the integration of digital games into educational processes. It is mainly focused on primary schools. It researches about 78 different papers used in lots of different countries with an abundance of educational objectives. It confirms the increasing wealth of scientific studies dealing with game based learning.
This paper is relevant to my project because it deals with the two main features of my project which is games and education and integrating the two based of lots of research.

S. Tobias (2011). ***Computer Games and Instruction****.*

This paper looks at the use of games and instruction. Jin and Low noted that more than 4,000 years ago a game was used for training in China. They point out that the value of instructional games has grown. They provide lots of evidence for the value of computer games for instruction.
This poaper is relevant to my project because it recommends research to enhance the usefulness of games for instruction.

*J. J. Vogel (2006)****. Computer games and interactive simulations for learning.***

This paper looks at which educational technology results in the highest cognitive gain for learners. This paper conducted a meta-analysis to decipher which teaching method and games was best for learning. The outcome of the paper was that across people and situations, games are more dominant for cognitive gain outcomes.

This paper is relevant to my project because it deals with how games can help with cognitive learning.

J. Kirriemuir and A. McFarlane (2004). ***Literature Review in games and learning.*** *-This paper discusses why Computer games are today an important part of most children's leisure lives and increasingly*
an important part of our culture as a whole. This paper is relevant to my project because it helps with making the game more efficient at helping the user learn.

Periodista Rafael Gómez Montero. ***Design methodology for interactive screen plays****. – there have been numerous studies published on the benefits offered by educational video games for student development and there has been a definite increase in the use of games for this purpose. There isn't many methodological*

proposals for educational video game development, but, the proposals analyzed in this paper display certain drawbacks that prohibit them. This paper offers a new methodology for developing educational games and interactive screenplays.

This paper was recommended by one of my lecturers and is relevant to my project because it helps with the design methodology of my game.

References:

1.
Aspects of the integration of games into educational processes. Ilaria Caponetto (Istituto per le Tecnologie Didattiche, CNR, Genova, Italy), Jeffrey Earp (Istituto per le Tecnologie Didattiche, CNR, Genova, Italy) and Michela Ott (Istituto per le Tecnologie Didattiche, CNR, Genova, Italy)

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S. Tobias, J. D. Fletcher, D. Y. Dai, and A. P. Wind, 'Review of research on computer games', Computer games and instruction, pp. 127-222, 2011.

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J. J. Vogel, D. S. Vogel, J. Cannon-Bowers, C. A. Bowers, K. Muse, and M. Wright, 'Computer gaming and interactive simulations for learning: A meta-analysis', Journal of Educational Computing Research, vol. 34, no. 3, pp. 229-243, 2006.

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J. Kirriemuir and A. McFarlane, 'Literature review in games and learning', 2004.

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http://ceur-ws.org/Vol-1394/paper_9.pdf

Proposed Approach

Wildlife will allow the user to explore outdoor terrains within the game which will be full of Irish wildlife. They will be able to do this through first person movement and they will be able to find and inspect different animals and plants in the game. By inspecting them the user will get access to information about the desired object they are looking at such as videos, images, and text.

The user will be able to create and start a new environment whenever they please. These environments will be randomly generated by the game. There will be two types of terrains/environments the user will be able to generate, the first one will be a rural terrain based off something you would have in Ireland with wildlife and animals to suit. The second terrain will be based off a more urban environment with animals and wildlife similar to what you would get in the cities.

When exploring these terrains the user will have access to a virtual notebook/diary. Upon finding wildlife and inspecting it, the info collected will be added to their virtual notebook. This will allow the user to have access to the information whenever they please. In this notebook feature the user will be allowed to start a quiz based on the wildlife information they have collected.

All the wildlife in the game will be either animated or use AI to function (sometimes both) and move throughout the map.

There are three main areas to my approach:

1. Design and Research
2. Implementation
3. Testing and Maintenance

Design and Research

- Research will need to be done on HCI for children and games.
- Research into the ADDIE model.
- Research based off design methodology for educational games.
- Research for blender, unity and modelling and rigging.
- Importing from blender to unity.
- Research for designing the UI.
- Research for creating the database.
- The front end should be designed to suit young users and designed to be as appealing as possible.
- A lot of research will go into the best architecture for this game.
- Research will also be done into Irish wildlife.
- Research into various academic papers.

Implementation

- I will first design the back end and make sure all my assets or create and imported into unity and blender. Once this is done, I will piece everything together in unity and finally design the front end.
- I plan to use 3d scanning apps to create some of my models and prefabs.
- Using Blender, I can also create animals and models to be Imported into unity.
- To rig my animal models, I will use blender.
- In unity I will use C# when coding and using scripts.
- I will also use google maps satellite images for the urban terrain to create models and Microsoft edge text to speech tools for in game commentary.
- Once I have finished, I will launch this game to be played on a website or available for download.

- A database will be used to store info in notebook feature.

Testing and Maintenance

- This application will be tested by a variety of users.
- It will be tested by users playing the game and giving their feedback.
- It will also be tested by me to find any potential bugs and errors.

Deliverables

- Project Dissertation
- Game to be available for download online.
- Interim Report.

Technical Requirements

- PC.
- Database.
- Blender.
- OpenStreetMap Addon.
- IOS 3D Lidar Scanning App.
- Unity.
- Computer for testing.
- Trials for people testing the game.

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Project Reviews – Please include reviews of two of LAST 2 years projects from either DT228, DT282 or DT211C.

Project 1
Title: EvolVR – Investigating Procedural Ecosystems and Evolution

Student: Ryan Byrne

Description (brief):

- The goal of this project was to create a virtually simulated ecosystem of animals from multiple animal groups to better demonstrate the evolutions animals make over multiple generations. The environment is procedurally generated so that animals can be viewed adapting to a multitude of different habitats of varying hostility and seeing how traits of the animal might develop differently from one placed in a different bio-network. The animals use behavior trees to control their AI which will adapt to the different situations the animal finds itself in and cause emergent behaviors. This project will be made as a Virtual Reality simulation. This will allow for a much more interactive and educational experience. The user will be able to traverse through the world in a safari-like experience where they can get close to animals and see their behaviors in a much more personal and realistic manner as if they were a real-life animal zoologist.

What is complex about his project?

- Mutating the animal genes and using behavior trees with ai to determine whether the species will die off.

What technical architecture was used?

- Unity
- C#
- UnityXR
- URP
- Blender

Key Strengths and weaknesses:
Strengths:

- Exploration of environments
- Customization
- Information given on each animal
- Good animal rigging and variants

Weaknesses:

- No interaction with animals
- Long load times

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Project 2

Title: How Games Can be Augmented for Inclusion

Student: Max Blennerhasset

Description (brief):
This project attempts to address the problem of games being inaccessible to sensory impaired individuals, particularly those with eyesight impairments. The game created for this project is named "Pentris". Pentris is a game focused on accessibility, it can allow far more focus for accessibility rather than actual gameplay or narrative. Depending on the game's design, particularly the genre it classes itself as, a game may be far more limited in the level of accessibility functionality that can be realistically implemented without changing the core design of the game.

What is complex about his project?

- Testing accessibility features with a wide audience in mind was difficult.

What technical architecture was used?

- JavaScript
- HCI
- C#
- Unity
- Python

Key Strengths and weaknesses:

Strengths:

- Introduction of sonification into an accessibility game to aid the visually impaired.
- Designed accessibility features that can be used in other games.

Weaknesses:

- No ability to have the game play audio through a single speaker.
- Too difficult to test accessibility features on.

Proposal Sign off:

Jake Bolger
C18395341

Student Signature: Jake Bolger	**Date: 11/10/2021**
Lecturer Signature:	**Date:**