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| UFCFS4-30-3 Creative Technologies Project Proposal Document | |
| Student Name: | Hector Martin-Davies |
| Student Number: | 16020968 |
| Project Title: | Dynamic Weather system pipeline |

# Description

The project will be a weather system that will produce multiple types of conditions. These conditions will be clear / cloudy, light and heavy rain, light and heavy snow, thunder and lightning. This will be a pipeline that can be implemented into a game for other developers to use. The snow affect will only happen when the temperature is set below -2 when the rain is enabled.

* Produce different types of particles etc. Rain, snow, lightning and fog.
* Have switches to enable or disable conditions.
* Use sliders to control strength of conditions and also temperatures.
* To be produced in Unity plugins using C++ and C#.

Write a full introduction to and description of your project. What is it, what will it be, what will it look/feel/sound like? Write a few paragraphs but remember there is a background section next. If you can’t summarise it clearly in a couple of paragraphs then there is probably something wrong with your project.

Then add a bullet point list of your specific **deliverables**.

# Research and background

All modern games will have some sort of weather system, the weather system will have a bigger effect on some compared to other games. Racing games will change drastically on weather conditions, if it’s dry then the car will grip well if its wet the car will have reduced grip and slide more. Shooter games it can change the sound of footsteps, visibility to see other objects or opponents. Some games will have dynamic weather, this is when the weather will change and alternate between different conditions, for example in Player Unknown Battlegrounds there is a dynamic weather system that will change the weather while the game is in play, this means it will start on one condition then change as the match progresses.

*Figure 1. Showing different weather conditions in Player Unknown battlegrounds, used from* <https://allgaming.news/2019/08/22/pubg-update-4-2-out-with-dynamic-weather-destructible-objects/>

As this is the first time creating a plugin for unity there is background research for doing this, Unity has been used throughout the year of the games tech course but never required a plugin to be created.

What is the background to this project? What research have you completed so far? This should be the largest part of the proposal.

# Objectives

Probably 3-4 objectives for each.

### Project objectives

What is your project intending to achieve ?

* To create a plugin for unity.
* Intended to use the particle system to make rain and snow.
* Have a pipeline to make it easily controllable, with sliders and switches.

### Research objectives

What do you want/need to find out? What area are you exploring or discovering?

* To find out what problems that can occur when creating a weather system pipeline and trying to avoid these problems.
* Find efficient methods to produce particles with memory leaks not occurring.
* Find out what limitations can impact this project and if there is a way around them.

### Learning Objectives

What do you intend to learn from this project?

* Gather a better understanding of Unity plugins.
* Have a better understanding of coding with C++ and C#.
* To create an advanced pipeline that controls multiple conditions.

# Methods, techniques, tools and processes

The project will be created as a unity plugin, I will be using GitHub as a way of keeping it backed up, allowing me to have the project at any computer with GitHub on it. I will be using both C++ and C# coding skills with managed and native plugins for unity. The project will be data driven, this will mean that inputs are easily changed and don’t require a user to go into the code.

How will you go about completing your project? Go into **detail** about the various skills, competencies and processes you have learnt through the course and on placement. Frameworks, libraries, UX processes, HCI methods, design approaches, etc. This question is for you to explain *how* exactly you will tackle the project and *what* exactly you will need to do to complete it.

# Risks and issues

What might go wrong? What dangers or problems do you face? How are you going to avoid or sort out those problems? Please be project-specific; lack of motivation or loss of data could happen to anyone, so won’t count here.

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| Risk | Mitigation | Contingency |
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# Specialist resources and support required

I will not be requiring any specialist resource and support, other than the supervisor that has been assigned to me and the software and hardware that is on the computers in the Games Technology assigned room at UWE Frenchay.

Are there any special resources or specialist support you will need? We need to know this so we can try and help you sort out any hardware, software, skill or knowledge shortfall. This section can be very short if you feel you don’t need any special support or provision of resources.

# Sources and references

We need to see the UWE Harvard style referencing format. You will want to check <http://iskillzone.uwe.ac.uk/> to help you with this referencing. Books are good because they take you to a depth that most websites won’t. But make sure they are relevant and up to date. Sources from professional environments (forums, git hub folders, blogs, tweets etc) also need to be documented. Definitely include (and read!) one or two guides about doing student final year projects.

Author, A. (2009) *A Book About Student Projects*. Publisher.

Author, B (2008) ‘Journal Article’, *Digital Media Journal*, 13, pp 13-23

University of the West of England (2009) *UWE Library Services:Study skills - The Harvard System* [Online] Available from <http://www.uwe.ac.uk/library/resources/general/iskillzone/referencing/harvardreferencing/> [18 September 2009]

# Monthly project plan

The more detailed the better. Work out all the tasks you think you will need to do and the order. Put an estimate of the amount of time by each. See what this adds up to.

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| October | Final proposal to be submitted by 10/10/2019  Start producing the plugin – this will require using the reach I have gathered and understanding of the libraries, to be applied to the start of my project.  Plan what will be needed in the plugin. | Throughout month after proposal hand in |
| November | Continue working on the plugin – having rain being admitted to have some effect on player character.  Transition – working to produce snow from rain. | Throughout month |
| December | Further work on plugin- transition and snow build up  Transition – getting a smooth transition from rain to snow that is driven by a temperature variable, as this variable goes lower the more snow will be produced.  Snow build up – when snow falls it builds up on the ground, there will be tracks behind the player that will slowly start to fade out as snow continues to build. | Throughout month |
| January | Transition – have the opposite effect when the temperature rises the snow will start to melt, having a humidity float will cause fog to appear.  Lightning – lightning will appear when enabled but only if it is currently raining with a high temperature. | Throughout month |
| February | Transition – having slippery ground when turning colder to affect player grip, walking through snow affecting players movement speed. | Throughout month |
| March | Smoothing out the system to run efficient bug testing fixing any problems that occur. | Throughout month |
| April | Continue fixing any problems and polishing, having the project finished.  Hand-in 23/04/2020 | Throughout month before hand in. |



Faculty of Environment & Technology

Faculty Research Ethics Committee (FREC)

**Ethical Review Checklist for Undergraduate and Postgraduate Modules**

*Please provide project details and complete the checklist below.*

**Project Details:**

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| **Module name** | **Creative Technologies Project** |
| **Module code** | **UFCFS4-30-3** |
| **Module leader** | Michaela Palmer |
| **Project Supervisor** | **James Huxtable** |
| **Proposed project title** | **Dynamic Weather System Pipeline** |

**Applicant Details:**

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| **Name of Student** | Hector Martin-Davies |
| **Student Number** | 16020968 |
| **Student’s email address** | Hector2.Martin-Davies@live.uwe.ac.uk |

| **CHECKLIST QUESTIONS** | | **Yes/No** | **Explanation** |
| --- | --- | --- | --- |
|  | Does the proposed project involve **human tissue,** **human participants, animals, environmental damage, or the NHS.** | No | *If the answer to this is ‘No’ then no further checks in the list need to be considered.* |
|  | Will participants be clearly asked to give consent to take part in the research and informed about how data collected in the research will be used? | No |  |
|  | If they choose, can a participant withdraw at any time (prior to a point of “no return” in the use of their data)? Are they told this? | No |  |
|  | Are measures in place to provide confidentiality for participants and ensure secure management and disposal of data collected from them? | No |  |
|  | Does the study involve people who are particularly vulnerable or unable to give informed consent (eg, children or people with learning difficulties)? | No |  |
|  | Could your research cause stress, physical or psychological harm to humans or animals, or environmental damage? | No |  |
|  | Could any aspects of the research lead to unethical behaviour by participants or researchers (eg, invasion of privacy, deceit, coercion, fraud, abuse)? | No |  |
|  | Does the research involve the NHS or collection or storage of human tissue (includes anything containing human cells, such as saliva and urine)? | No |  |

Your explanations should indicate briefly for Qs 2-4 how these requirements will be met, and for Qs 5-8 what the pertinent concerns are.

* **Minimal Risk:** If **Q 1 is answered ‘No’**, then no ethics approval is needed.
* **Low Risk:** If **Qs 2-4 are answered ‘Yes’ and** **Qs 5-8 are answered ‘No’**, then no approval is needed from the *Faculty Research Ethics Committee* (FREC). However, your supervisor must approve (a) your information and consent forms (Qs 2 & 3) and (b) your measures for participant confidentiality and secure data management (Q4).
* **High Risk:** If **any of Qs 5-8 are answered ‘Yes’**, then you must submit an application for full ethics approval *before* the project can start.This can take up to 6 weeks. Consult your supervisor about how to apply for full ethics approval.

**Risk Assessment:** Separate guidance on risk assessment can be found on UWE’s Health and Safety forms webpage at <https://go.uwe.ac.uk/RiskAssessment>. If needed, you must complete a Risk Assessment form. This must also be attached to your application for full ethics approval if your project is **High Risk**.

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| **Your supervisor must check your responses above *before* you submit this form.** |
| **Submit this completed form via the *Assignments* area in Blackboard (or elsewhere if so directed by the module leader or your supervisor)***.* |
| After you have uploaded this form, your supervisor will confirm it has been correctly completed by “marking” it as *Passed*/100% via the *My Grades* link on the Blackboard*.* |

Further research ethics guidance is available at <http://www1.uwe.ac.uk/research/researchethics>