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Abstract

Procedurally generated weather based on a number of conditions, such as climate and season, makes up this tool that allows for immersive world building through its dynamic nature.

TECHNICAL DESIGN DOCUMENT

Climate-Based Dynamic Weather System

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# Glossary

*Abbreviation followed by the wording.*

GPU – Graphics Processing Unit

CPU – Computer Processing Unit

PCG – Procedural Content Generation

# Introduction

The PCG weather tool will create a weather system for the game on which it is used. It will create realistic weather by selecting features based on a number of settings that the layer can choose – most notably, climate, but also season and time of day.

# List of Features

* Wind movement
  + I will have a parameter for wind speed that will be generated by my algorithm, and a master material for the foliage used throughout the level. The parameter will be used in the master material with grass wind speed, which will affect the movement of the leaves and simulate wind
  + A maximum and minimum wind speed can be set in the editor
* Day/night cycle
  + Can be enabled/disabled in the editor
  + Will transition from a bright scene with a clear sky to a dark scene with a starry sky over time. The length of the cycle can be adjusted in the editor
  + The weather that is generated will be different depending on whether it is day or night
* Climates
  + The main factor of the PCG. There will be six climate presets, all with different kinds of weather that can be generated
* Clouds
  + Clouds of different shapes and colours will appear in the sky and move over time

# High Level Diagrams (if any / delete as appropriate)

Any documentation to support the development process for the system. UML, etc.

# Engine Requirements

The tool will be developed in Unreal Engine 5.4 but will be compatible with older versions of Unreal Engine 5.

# Logic and AI Requirements

Is this needed for your artefact?

# Audio and Visual Requirements

Niagara systems will be used to create weather features, such as fog and precipitation. Additionally, dynamic materials will be used to demonstrate wind. Audio can be enabled to play alongside certain weather features.

# User Setup Guide

How to setup the game engine to accommodate the tool process. All sections are a user setup guide and how to use them.

# Minimum System Requirements

Give this some thought! This is for the engine!

# UI of the Tool/Artefact/System

The UI of the engine

# External Library Dependencies

List all if any libraries needed for the engine and game.

# Platform Specifications

The tool requires relatively high processing power and graphical capabilities, so is more aimed at being used on projects being created for PC games or powerful home consoles.

# Asset Pipeline

How to bring in assets and where to they go.

# Material Pipeline

Shader systems, etc.

# Assessment Related Requirements to be answered:

* Problem that inspired the Tool system.
* Proposed solution(s) to the problem which DID NOT include an existing Tool System.
* Proposed solution(s) to the problem which DID include an existing Tool System.
* Purpose of use within the development cycle.
* Intended departmental use (art/sound/design/programming)/target audience use.
* Tool System engine user manual considerations.
* Potential upgrades/Future developments.

# Horizontal Prototype

Time and date of post.

Link to post.

**On the post:**

It is ideal to have this as a single but very detailed post on the forum.

Include:

* Have the title “Horizontal Prototype”.
* Visual inspiration
* Technical inspiration
* UI inspiration
* Output inspiration
* Anything else you feel is beneficial to the way the system should look and its outputs.
* Images
* Videos

# Vertical Prototype

Time and date of post.

Link to post.

**On the post:**

It is ideal to have this as a single but very detailed post on the forum.

Include:

* Have the title “Vertical Prototype”.
* System summary
* Identify core system output/function achieved in the Vertical Prototype
* Show iterations of the system within the vertical prototype phase (if any. May only be one)
* Show the output at this stage.
* Images
* Video(s)
* Test plan in the primitive format (incomplete or partially complete)

# Polished System

Time and date of post.

Link to post.

(Submit zip file separate)

**On the post:**

It is ideal to have this as a single but very detailed post on the forum.

Include:

* Have the title “Polished System”
* System User Manual
* Show system output to a polished level.
* Show iterations of system output to a polished level.
* Show the system requirements for your Tool system.
* State the usage of the system and how it fits into the development cycle.
* Complete test plan.
* Images
* Videos

# Test Plan

Add your completed test plan here as a table.

Include:

* Test item
* Expected Outcome
* Actual Outcome
* How Did You Fix It? (if necessary)

# System User Manual

Add your user manual here, simply continue writing this document in the format of a user manual beyond this point.

Include:

* System brief
* System output
* Development Cycle Application
* System requirements
* Team the system would be suitable for.
* If UI explain it and how to work it.
* Identify future updates (1-2 no more)

# Add more headers as appropriate. This is basically how to use the game engine. Take inspiration from UE5.2.1 Docs.

# Additional Supportive Documentation

Any additional documentation that is relevant to the project.

# Bibliography

Harvard Referencing examples:

**Website**:

**Bibliography format:**

BBC News (2008) Factory Gloom worst since 1980 [Online]. Available from: http://news.bbc.co.uk/1/hi/business/7681569.stm [Accessed: 21 October 2008]

**In-text example:**

(BBC News 2008)  
…as reported on BBC News (2008)

**Book (1 Author)**:

**Bibliography format:**

Neville, C. (2007). The Complete Guide to Referencing and Avoiding Plagiarism. Maidenhead: Open University Press

**In-text example:**

(Neville, 2007)  
Neville (2007) commented that…  
“Direct quotations are placed in double quotations marks” (Author’s Surname, Year of Publication, p. – followed by page number – in brackets)

**Journal**:

**Bibliography format:**

Trefts, K. & Blaksee, S. (2000). Did you hear the one about Boolean operators? Incorporating comedy into library instruction. Reference Services Review. 28 (4) p. 369-378.

**In-text example:**

(Trefts & Blaksee 2000)

This supports Trefts & Blaksee’s (2000) evidence that……  
“direct quotations are placed in double quotations marks” (Author’s Surname, Year of Publication, p. – followed by page number – in brackets)

# Appendices

Any supporting documentation can be added to the appendix. This can relate to any section of the report.

It also helps if the appendix has its own content page and naming conventions.

## Appendix 1: Title

## Appendix 2: Title