ISSUE: 001 – 02/10/2024

KARA

Newsletter – Issue 001

Welcome to the KARA newsletter. These newsletters will keep you informed about the research and development that the KARA project team are undertaking.

Contents

In this edition we introduce you to the goal of KARA and explain how Electric Square's very own *Detonation Racing* is helping us on this journey.

We'll also take you through some of our early research and how we've tried adapting it to our pipelines.

1. What is KARA?
2. Pipeline spotlight: Creating a Skybox

IMPORTANT: Inclusion of tools in this newsletter does not imply their clearance for use.

What is KARA?

In 2023, Project AVA took on the challenge of utilising Generative AI tools to assist in the design and development of a videogame from scratch. This applied R&D approach gave us the best insights into the true potential of AI for video game development.

The AVA team went to GDC in 2024 to report on their findings (watch the video).

KARA is the continuation of this effort. Using Electric Square's *Detonation Racing* as a case study, the team's plan is to remaster the game using pipelines infused with Generative AI tools.

The goal of KARA is to further enhance our expertise in Generative AI for game development. This includes a focus on how GAI tools can boost 3D art pipelines.

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PIPELINE SPOTLIGHT

Creating a skybox

Introduction

A skybox is a crucial element in game environments, providing a seamless backdrop that enhances the immersion and realism of the game world. It typically includes the sky, clouds, distant landscapes, and other atmospheric effects.

Creating visually compelling and performance-efficient skyboxes can be a complex and time consuming process.

PIPELINE SPOTLIGHT

Creating a skybox

STANDARD PIPELINE

Considerations

This example is a simple static skybox. With more development, more complex skyboxes can be created.

Skyboxes can be made that dynamically change the time of day, even weather conditions.

For larger complex games the skybox may be procedurally generated.

Standard pipeline

1 Image Acquisition or Creation

Artists use real-world photos, 3D renders, or even hand-drawn artwork.

High-resolution images are essential for a good-looking skybox.

Often the source of these images requires bespoke photography.

2 Image Processing and Prep

Artists use stitching software or techniques to create a seamless, spherical image.

They will adjust the colour, levels and even style.

For realistic lighting they'll consider converting the images into an HDR format.

3 Format Conversion

The artist maps the images onto a model.

For example: A cubemap is a set of six images (front, back, left, right, up, down) that form an illusion of an environment when viewed from the inside out.

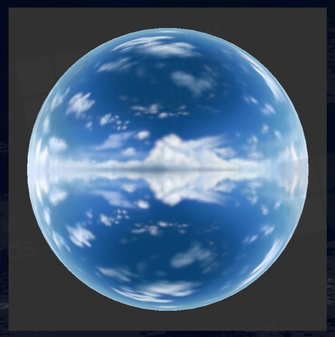
Alternatively, more complex spherical mapping can be used. Like the example below.

4 Integration

The skybox is loaded into the game engine at the desired position and scale to encompass the entire scene. The skybox is rendered before other objects in the scene to create the background.

Intensity and lighting settings are set up.

Examples of output from a typical pipeline:



Original skybox from Detonation Racing:

PIPELINE SPOTLIGHT

Creating a skybox

AI INFUSED PIPELINE

Tools used:

Skybox AI by Blockade Labs

"With Skybox AI you can easily create worlds with simple text prompts, remix them to be a completely different world, and edit your world to add or remove elements."

https://skybox.blockadelabs.com/

1 Image Acquisition or Creation

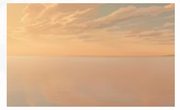
Using a tool like 'Skybox AI' you are able to write a prompt and generate a skybox.

Remix! Select a different render style/model to change the look of your skybox.

Fast iteration may be required to get the desired result.

2 Image Processing and Prep

Small edits using standard software may be required to remove unwanted elements.



Photoshops 'Generative Fill' is exceptionally good at removing unwanted elements.

3 Format Conversion

The tool allows you to save out directly to the file format that you require.

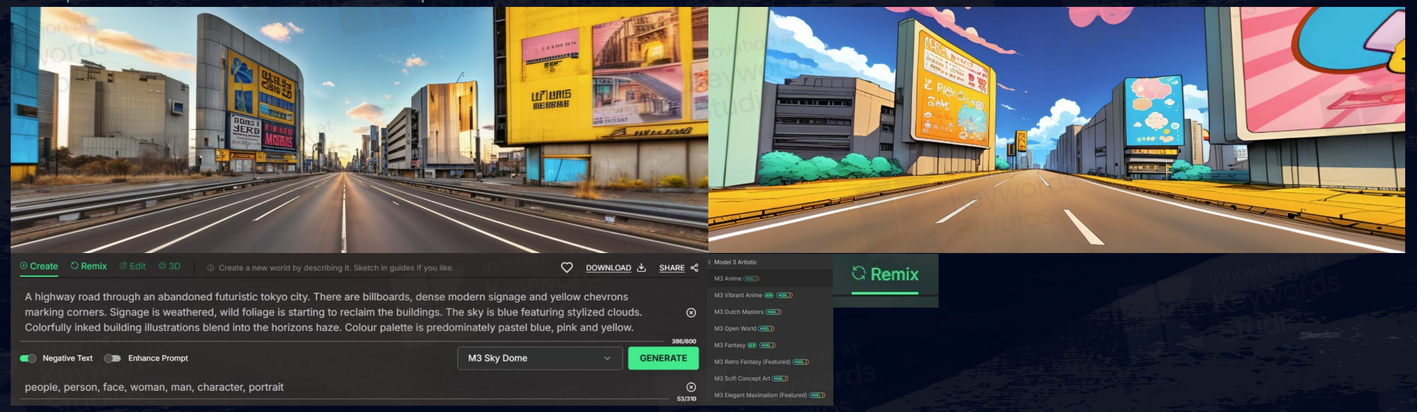
Equirectangular: JPG, PNG
Cube Map: Default, Roblox
HDRI: HDR, EXR
Depth Map

4 Integration

The skybox is loaded into the game engine at the desired position and scale to encompass the entire scene. The skybox is rendered before other objects in the scene to create the background.

Intensity and lighting settings are set up.

Example workflow from the AI Infused Pipeline:



New skybox for Detonation Racing, matching a new anime art style:

PIPELINE SPOTLIGHT

Creating a skybox

Tools used:

Skybox AI by Blockade Labs

Example Styles:

Results for Detonation Racing:

Thank you.

Featured in the next issue:

Texture projection with ComfyUI and Stable Diffusion.