

Reinforcement Light Rays Path-Tracer Progress Report

Callum Pearce

cp15571@my.bristol.ac.uk

Abstract—This document contains my weekly progress of my thesis as part of my 4th year masters unit COMSM0111 in 2018/19. It is mainly useful to myself for reflecting on the decisions I have made throughout the project and why I chose them. However, I also hope it gives a detailed overview of how the project evolved with time for any other reader.

I. INTRODUCTION

Each section of this document describes a single week of work. For each section I have decided to include the following break down:

- **Goals:** A few set goals I aimed to achieve in that week and the motivation behind them.
- **Research/Implementation Details:** What was done, and how it was achieved.
- **Resources:** Describes what resources were notably helpful during the week for research/implementation details.
- **Reflection:** What I believed went well in the week, what to avoid in the future, and were the goal outlined achieved? Finally, if necessary, what has changed for the project as a whole?

WEEK 1

Building off some preliminary research I decided I had to build a ray-tracer in order to start any work with my project. This would be a good way of refreshing the basics of computer graphics.

A. Goals

- 1) Build a basic ray-tracer from scratch using only SDL and GLM as external libraries

B. Research/Implementation Goals

This week was fairly simple in terms of implementation. I mainly based my work on the ray-tracer I built with my project partner in my 3rd year of university. I used a similar project structure and followed the lab-sheets from COMS30015 by Carl Henrik Ek. By the end of the week I had built a ray-tracer which simulated the following in real-time:

- Constructing surfaces from triangle primitives and projecting them onto a 2D pixel plane for camera viewing via ray-tracing.
- Supports camera movement
- Direct illumination

C. Resources

As mentioned the main resources used were those provided for COMS30015 by Carl Henrik Ek in 2017. They gave me a good refresher on all the core concepts of ray-tracing and the mathematics behind it.

D. Reflection

I met my goal this week and built a well designed code-base to go with it.

WEEK 2

E. Goals

- 1)

F. Research/Implementation Goals

G. Resources

H. Reflection

WEEK 3

I. Goals

- 1)

J. Research/Implementation Goals

K. Resources

L. Reflection

WEEK 4

M. Goals

- 1)

N. Research/Implementation Goals

O. Resources

P. Reflection

REFERENCES

- [1] Ken Dahm and Alexander Keller. Learning light transport the reinforced way. *arXiv preprint arXiv:1701.07403*, 2017.