

<Full title of Project>

<Full Name of Author>

Submitted in accordance with the requirements for the degree of
<Name of Degree>

<Session>

The candidate confirms that the following have been submitted.

<As an example>

| Items | Format | Recipient(s) and Date |
|---------------------------|-------------------------|------------------------------------|
| Deliverable 1, 2, 3 | Report | SSO (DD/MM/YY) |
| Participant consent forms | Signed forms in envelop | SSO (DD/MM/YY) |
| Deliverable 4 | Software codes or URL | Supervisor, Assessor (DD/MM/YY) |
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Type of project: _____

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I understand that failure to attribute material which is obtained from another source may be considered as plagiarism.

(Signature of Student) _____

Summary

<Concise statement of the problem you intended to solve and main achievements (no more than one A4 page)>

Acknowledgements

<The page should contain any acknowledgements to those who have assisted with your work. Where you have worked as part of a team, you should, where appropriate, reference to any contribution made by other to the project.>

Note that it is not acceptable to solicit assistance on ‘proof reading’ which is defined as the “the systematic checking and identification of errors in spelling, punctuation, grammar and sentence construction, formatting and layout in the test”; see <http://www.leeds.ac.uk/gat/documents/policy/Proof-reading-policy.pdf>.

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Chapter 1

Background

1.1 2D Fractals

- Mandelbrot set in 2D

1.2 3D Fractals

[1]

- Julia sets and relationship to Mandelbrot
- Mandelbrot set in 3D - Mandelbulb
- More "formal" sets with quaternions

1.3 Signed Distance Functions and Raymarching

- Basic explanation of distance functions, signed and unsigned
- Explanation of Mandelbulb SDF

1.4 Signed Distance Fields

Chapter 2

Theory

2.1 Project aim

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2.2 Code Performance Theory

Chapter 3

Implementation

3.1 Project Structure and Overview

3.2 Rendering 3D Fractals

3.3 Signed Distance Field

3.4 Second Attempt: 2D Texture SDF

3.4.1 Single-pixel Sampling

3.4.2 Sampling a small area

3.5 Possibly Additional - Cone Marching

3.6 Performance Measurement

3.6.1 Data Types Collected

3.6.2 Representative Views

3.6.3 Animation

Chapter 4

Results

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Chapter 5

Conclusion

5.0.1 Static SDF

Wife bad.

Use Cases

Maybe wife not so bad with 100+ fractals?

5.0.2 Texture SDF

Single-pixel Sampling

Multi-pixel Sampling

Use Cases

References

- [1] J. Aron, “The mandelbulb: first ‘true’3d image of famous fractal,” *New Scientist*, vol. 204, no. 3736, pp. 54–55, 2009.

Appendices

Appendix A

External Material

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Appendix B

Ethical Issues Addressed