

Fjalar Högnason Loodberg

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Education

MSc. Engineering, Nanoscience

Sep 2019 - Jun 2024
Lund University

- Deeply intersectional program, covering chemistry, physics, biology, electronics, often a focus on scientific research
- Specialization in materials chemistry and nanophysics
- Used Java, C++, C, Python, and MATLAB in various mandatory and elective courses
- Master's Thesis in materials chemistry:
 - Used transmission electron microscopy (TEM) and a unique gas handling system to study new materials at the atomic scale
 - Used Python & MATLAB for processing of application-specific TEM file formats, gas handling system data, simulations

Teacher's Assistant, Programming

Jan 2022 - Jun 2023
Lund University

- Helped students with programming exercises and assignments in Java
- Supervised study hall sessions and lab sessions
- Graded student assignments
- Cemented my own programming knowledge

Summer Research Project

Jun 2023 - Aug 2023
Lund University

- Studied nanoparticles of multiple novel metal compounds using transmission electron microscopy & associated techniques
- Data processing using Python & MATLAB, scientific writing in L^AT_EX

Personal Projects

Raytracing/raymarching

Rust, WGS

gitlab.com/Fjalar/raymarching
github.com/fjalar/weekend-rt

- Offline software raytracer
 - No dependencies besides for RNG
 - Manual texture parsing and output serialization
 - Following the famous Raytracing in one weekend book series, translated to idiomatic Rust
- Interactive 3D raymarcher
 - Using the modern Rust graphics library WGPU, along with the WGS shading language
 - GPU-accelerated 3D rendering engine similar to raytracing

Fractal Explorer

C++, Rust

gitlab.com/Fjalar/mandel
gitlab.com/Fjalar/bittermandel

- Explorable software-rendered fractals using the SDL2 framework in C++
- Later re-implemented in Rust using the Bevy game engine, the egui UI library, and GPU acceleration

Web Games

Rust, GitHub Actions

fjalar.github.io/2048
fjalar.github.io/fairflips

- Games written using the Bevy game engine in Rust, available online through continuous deployment
- Some of my work became an open source contribution to the Bevy project

Select Courses

Programming - First Course (Java)	7.5 ECTS
Programming - Second Course (Java)	7.5 ECTS
Concurrent Programming (Java)	7.5 ECTS
C++ Programming	7.5 ECTS
Efficient C	7.5 ECTS
Memory Technology for Machine Learning	7.5 ECTS
Applied Machine Learning (Python)	7.5 ECTS

Skills

Programming languages: Java, C++, C, Rust, Python, MATLAB

Tools: Linux, Git, GitHub CI/CD, L^AT_EX, Typst, Word, Excel

Languages: Swedish (C2), English (C2), German (B2), Icelandic (A2)