Thomas Chernaik

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Summary

Fourth year computer science with high performance graphics and games engineering undergraduate at the University of Leeds, expected graduate with first class honours BSc, MEng in 2025. Team player in group projects and for a university hockey team. Experience with personal and educational projects in Python since 2018, C# since 2020 and C++ since 2022. Aspiring to work as a Game Developer.

Projects

C++ & OpenGL Gaussian Splatting Rasteriser/ Third Year Project

December 2023 - May 2024

- Implemented a fully GPU based pipeline for rendering splats, resulting in a renderer that can render scenes of up to 100,000 splats in real time on integrated graphics, and millions of splats interactively
- Wrote a GPU-Radix sort that can sort 1,000,000 32-bit key/value pairs in 80ms on integrated graphics, scaling linearly for sorting more values.
- Optimised the renderer using tile-based rendering, resulting in a 5x improvement in FPS
- Implemented a CPU based renderer to fully test, debug, and compare outputs of the GPU renderer to ensure the quality of the renders.
- Achieved a first-class grade on the project, which included a 30 page technical report.

OpenGL Rocket Game/ University Coursework

NOVEMBER 2023 - DECEMBER 2023

- Implemented a rocket launch scene with OpenGL and C++, and GLSL shaders
- Wrote GLSL shaders to render the world, rocket, and launchpads
- Developed a particle system for the rocket boost, able to render 2,000,000 particles in real time (4ms), on integrated graphics
- Managed loading OBJs and drawing their vertices every frame with different materials
- Added a split-screen system using two camera perspectives to view the rocket
- Implemented a modular UI system to display text to the screen and add buttons with functionality to launch and reset the rocket
- Implemented a simple animation system for the rocket's flight

Scribbles web game / Hobby project

JUNE 2023 - AUGUST 2023

- Solo project showcasing web development skills
- Created multiplayer system which could serve one or more user created games containing three or more users each on one server
- Provided a synchronised gameplay experience to players using websockets
- Deployed to cloud services using a Docker container
- Developed a responsive and mobile first frontend user interface utilising Bootstrap and Javascript

Chess desktop app / Hobby project
JULY 2023 - AUGUST 2023

- Developed a standalone chess application using C++ and SDL2 library
- Implemented core chess logic, including legal moves and check conditions
- Applied knowledge learned in university such as OOP and dynamic memory management

Sports centre booking system / University coursework
JANUARY 2023 - MAY 2023

- Collaborated with a large team using Git, and acted as a scrum master during crucial sprints
- Developed systems using Python, SQLite, and JavaScript including a calendar booking system
- Managed version control and contributions using branches and issues to allow concurrent work between different members of the team

Unity Delivery Game / Ludum Dare (Game Jam)
MAY 2023

- Partnered to rapidly develop a 3D game using Unity and C#
- Designed and implemented core gameplay mechanics, including package collection and delivery
- Engineered a custom physics system for van collisions with buildings and world borders

Various Unity projects / Hobby projects
SEPTEMBER 2021 - PRESENT

- Created 5+ hobby projects exploring Unity
- Developed a FABRIK implementation for procedural character animation with C#
- Crafted a slime mould simulation using HLSL compute shaders for real time simulation of hundreds of thousands of agents
- Designed procedural grass using batching and shaders and used optimisation methods to allow rendering of millions of blades of grass in real time, with wind and object interaction animations
- Implemented a peer-to-peer multiplayer system utilising UDP to provide real time updates between two game clients

Education

University of Leeds/ Computer science with High Performance Graphics and Games Engineering (BSc, MEng)
SEPTEMBER 2021 - JUNE 2025

- Expected First-Class Honours
- Relevant modules: Computer Graphics (undergraduate), Foundations of Computer Graphics, Advanced Rendering, Modelling and animation, Data structures and Algorithms
- Languages studied: C, C++, Java, Python

Dame Alice Owen's school / A-levels
SEPTEMBER 2019 - JUNE 2021

- Computer science **A***
- Mathematics **A***
- Physics **A***
- Further Mathematics **A**

Ashmole Academy / GCSEs
SEPTEMBER 2014 - JUNE 2019

10 GCSEs at grades 9-6 (including Mathematics and English)

Skills

Programming languages:

- Python
- C
- C++
- GLSL
- Java
- Javascript
- C#

Software skills:

- Git
- Bootstrap
- HTML
- SQL
- Unity
- Flask
- Debugging with GDB and IDEs
- OOP principles
- Websockets