

# Wojciech Rak

✉️ wojtekrajkdev@gmail.com

☎️ (438) 529-2204

🌐 wojtekrajk.dev

Since my last full-time role as a Software Developer, I have completed a Master's degree in High-Performance Graphics and Game Engine Engineering. My current focus is on creating high-performance interactive applications such as game engines, real-time renderers and games. Currently residing in Montreal, Canada.

## Employment History

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**Virtual Trader Ltd**

*Software Developer*

**Coventry, United Kingdom**

2017 - 2023

Virtual Trader delivers mission-critical automation for intercompany and intracompany ERP and financial accounting processes for some of the world's largest companies.

- Developed an HTTP client capable of making requests out to secure REST and SOAP webservices. The HTTP client is capable of sending and receiving payloads in XML and JSON formats.
- Integrated the HTTP client with the main product at Virtual Trader and created a UI for it. This has allowed our users to call and consume responses from any REST/SOAP web service and send it to our product without knowing a programming language.
- Played a key role in developing and designing a new web-based dashboard for the main product using JavaScript(Webpack/Knockout.js/jQuery/ORDS). Also developed a suite of REST web services for the dashboard to use.
- Developed a front-end for an in-house file difference utility tool using Vue.js. This project required usage of modern front-end development features such as componentization, conditional rendering and dynamic class and style bindings.
- Helped with mentoring and training new Graduate Software Developers.

## Key Skills

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- **Programming Languages/Frameworks:** Proficient in: C#, C++, Javascript, Lua, SQL  
Familiar with: Odin, Python
- **Game Engines/Graphics API's:** Proficient in: Godot, Unity, OpenGL, Vulkan  
Familiar with: Unreal Engine 5
- **Industry Software Skills:** Source Control (Git, SVN), Jira, Jenkins(Continuous Integration/Continuous Delivery), Unix Terminal, Linux

## Education

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**University of Leeds**

*MSc in High-Performance Graphics and Games Engineering , Merit*

**Leeds, United Kingdom**

2023-2024

**Coventry University**

*BSc in Computer Science, Upper Second Class Honours*

**Coventry, United Kingdom**

2014-2017

## Notable University Projects

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### Interactive High-Density Voxel Scenes with Automatic Hole-Filling Functionality

- For my master's dissertation project I worked on expanding an already existing project which introduced a novel data structure known as HashDAG. This data structure allows for modifying compressed sparse voxel representation in real time. My contributions focused on addressing the limitations of traditional mesh-to-voxel converted scenes, which often resulted in thin, shell-only geometries. I developed a suite of interactive, brush-like tools such as flood fill, sphere hole fills, cube extrusions, and thickening operations that dynamically modify voxel data to add realistic volume and depth. This project involved handling high-density voxel datasets, where even small edits could involve processing millions of voxels.

### The Aire Game Engine

- During my second semester of my master's studies, I worked with 5 other students on the development of The Aire Game Engine, a project focused on building a usable game engine for 3D open-world video games. The engine emphasized rendering complex virtual environments, including terrain, water surfaces, sky, vegetation and skinned meshes. Developed in C++ with OpenGL, the project employed an iterative methodology with frequent prototypes, ensuring continuous progress and refinement. My contributions included implementing many parts of the world renderer, HUD rendering and ensuring that all the systems work together. Through this project, I gained hands-on experience with graphics programming, engine architecture, and performance optimization.

## Interests and extra-curricular activity

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- I like to spend my time working on personal programming projects to stay up-to-date with new and interesting technologies. These projects are often video games created using various engines/frameworks or small graphics projects.
- I have participated in numerous game jams, rapidly prototyping and developing small games within tight deadlines. Currently, I'm focusing on SUPER SHAPESHOOTER, my first full game made in the Godot game engine.

## References

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- References available on request