

MITCHELL TIMSON

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[Website: mtimson.github.io/Portfolio](https://mtimson.github.io/Portfolio)

SUMMARY

Software developer with strong object-oriented programming abilities. Experience leading team of engineers developing a VR 3D modeling application. Worked on developing large enterprise desktop CAD applications, and many other areas in research and education environments. Looking for next challenge in similar or completely new domains.

HIGHLIGHTED SKILLS

Strong modern C++ skills
QtQuick and QML UI framework
Focused on performance

Unity/C# experience
Strong mathematics background

EXPERIENCE

- | | |
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| July 2022
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September 2023 | Software Engineering Team Lead, Gravity Sketch <ul style="list-style-type: none">• Leading a team of developers working on implementing 3D geometric modeling features for a VR application• Operated as manager for the junior members of the team for part of my time in this role• Implemented agile methodologies within the team and executed on them (sprints, sprint planning and reviews). Also helped another team lead implement such practices• Contributed to implementing new engineering processes related to moving a product from a community release process to an enterprise software release process• Worked with product management team to implement new processes for tracking customer feedback and feature requests• Interacting with customers directly and via internal consultants and other internal stakeholders to understand and develop project requirements; using gathered feedback to plan and scope projects and identify the potential impact of projects for prioritization |
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- Supporting projects by soliciting feedback from key internal stakeholders, making decisions about incoming feedback to minimize scope creep, and making technical decisions when needed
- Mentoring engineers on coding practices and other software engineering best practices such as git workflows and Jira processes
- Review code, including large pull requests
- Implemented a mesh simplification system using parallel algorithms to automatically generate lower levels of detail meshes at runtime to improve performance of a VR application
- Implemented other geometric modeling features and improvements in Unity/C# application

January
2017 –
July 2022

Senior Software Engineer, Alias, Autodesk

- Development in many areas of a large (~5 million lines of code) surface modelling application (Alias) used for automotive and industrial design, including work on geometry algorithms, modelling tools, data serialization, data management tools, and user interface
- Fix bugs in 25+ year old legacy C code, as well as writing new features in modern C++ (14 and 17)
- Work on a project to implement a layered UI architecture with Qt/QML in a legacy application
- Work closely with designers when developing new features to deliver a quality user experience
- 2.5 years as git administrator for team of ~20 developers managing branching strategies for quarterly releases

March
2015 –
July 2016

Software Developer/Research Assistant, Nipissing University

- Collaborated with faculty and students from other departments on a variety of multidisciplinary projects, including weather data and watershed analysis visualization applications, and programs used to perform psychology studies
- Performed requirements elicitation activities on multiple projects
- Managed multiple projects with different colleagues
- Co-authored papers on parallel computing for scientific journals

EDUCATION

2016	Bachelor of Science, Honours, Computer Science, <i>Nipissing University</i> <ul style="list-style-type: none">• Certificate in Game Design and Development• J.W. Trusler Proficiency Award in Computer Science• Award in Robotics and Artificial Intelligence• Undergraduate Research Conference 2016, Digital Humanities Panel winner
2014	Bachelor of Science, Honours, Physical Science, <i>University of Guelph</i> Specializing in Physics
2007	Ontario Secondary School Diploma, <i>St. John Catholic High School</i> Ontario Scholar

PROJECTS

2023	Mesh Simplification <ul style="list-style-type: none">• Implement a simple mesh decimation algorithm to run on standalone VR headsets to generate lower level-of-detail meshes at runtime• Improve VR application performance when users import heavy geometry• Algorithm implemented with parallel components using Unity Burst compiler.
2021-2022	UI Modernization <ul style="list-style-type: none">• Replacing an in-house legacy C User Interface API with a modern C++ UI framework (Qt)• Introduce a layered UI architecture to separate the UI layer from the tools and algorithms• Required a significant refactor of a large application• Complete rewrite of a large application's UI in QtQuick/QML• Designed and implemented a QtQuick Tree View from scratch to support displaying all objects in a large scene (~10000+ entries) with high performance interactions• The tree view is also designed to be reusable in any view and with different sets of interactions depending on the provided data• Use object-oriented designs to connect the existing data model to the new UI in a minimally intrusive way
2019-2021	Assemblies <ul style="list-style-type: none">• Implemented an assembly system in Alias• Leveraged and extended an existing proprietary file format for Reference Files to support hierarchical references• Implemented all required changes to the system to support assemblies, including data serialization, geometry, in-canvas selection, drawing, and user interface.

Further details, screenshots, and links for the following projects, as well as additional projects, available at <https://mtimson.github.io/Portfolio/>

2016

Games Projects

- Developed games with Unity3D and C#
- Collaborated to complete all development activities, including requirements gathering, documentation, and testing
- Created game AI to control the movement of autonomous agents to simulate interesting behaviours, such as flocking

2016

GPU Programming

- NSERC funded project to investigate parallel and heterogeneous computing
- Implemented complex optimization algorithms in C, utilizing the NVIDIA CUDA API for GPU programming, OpenMP for multi-core parallel programming, and BLAS and LAPACK libraries for linear algebra operations
- Designed and executed experiments to investigate the benefits of various heterogeneous parallel configurations
- Co-authored paper that published in IEEE Transactions on Parallel and Distributed Systems – the abstract is available on the portfolio page linked above

2015 – 2016

Virtual Museum Exhibit

- Developed a web-based application to be deployed as an exhibit commemorating the 100th anniversary of the Battle of Vimy Ridge at the Military Communications and Electronics Museum in Kingston, ON
- Employed a number of technologies throughout the development of main application, including JavaScript, HTML, CSS, and JavaScript library Cesium
- Constructed tools using Python to allow client to easily populate the main application after development
- Created terrain meshes for application from maps using MATLAB

2014 – 2016

Coursework

- Gained experience programming in C, C++, C#, Java, JavaScript, MATLAB, Python, SQL, HTML, WebGL, and more
- Acquired strong mathematics skills in a variety of mathematics disciplines, including linear algebra, combinatorics, and number theory