

Bruno Opsenica

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EDUCATION

UNIVERSITY OF TORONTO

B.Sc. IN PHYSICS

Jun 2012 | Toronto, ON
Final Year GPA: 3.93

LINKS

GitHub: BruOp

Website: bruop.github.io

Twitter: @bruops

SKILLS

LANGUAGES

C++ • HLSL • GLSL •
JavaScript • Python

LIBRARIES

BGFX • Three.js • React •
Redux • Django • SQL

INTERESTS

Computer Graphics •
Numerical Simulation • Data
Visualization

EXPERIENCE

SPINVR RENDERING DEVELOPER

Mar 2020-Aug 2020 | Toronto, ON

- Improved real time rendering quality, stability and performance
- Worked with front end developers and product managers to improve the product experience for 3D artists and designers
- Prototyped an integration testing framework to validate rendering output against industry benchmarks
- Used **Javascript** as well as **C++**

DELPHIA (FORMERLY VOX POP LABS) SOFTWARE ENGINEER

Feb 2017-Feb 2020 | Toronto, ON

- Was part of a multidisciplinary team developing the company's iOS app and related infrastructure, including the server API and the data processing backend
- Worked closely with designers, data scientists and other software engineers to rapidly iterate and deliver new features to beta users
- Coded primarily in **JavaScript** using **React** and in **Python** using **Django**

FUNCTIONAL IMPERATIVE WEB DEVELOPER

Jul 2015-Oct 2016 | Toronto, ON

- Delivered web applications and was responsible for entire project, from code to planning to communicating directly with stakeholders, including clients

PROJECTS

ZEC REAL TIME RENDERER

August 2020-Present

A rendering library that wraps D3D12, with simple and light-weight abstractions to simplify resource creation and state management. Currently implemented features include:

- Render pass abstraction that allows adding of additional rendering features with automatic creation and transitioning of pass outputs and inputs
- Physically based rendering of open source GLTF models using a microfacet BRDF and the "roughness-metallic" workflow
- Analytic lighting implemented using clustered forward rendering to allow for a greater number of dynamic lights
- Imaged-based lighting with corrections for multiple scattering. Includes generation of the BRDF LUT, irradiance map and pre-filtered environment map
- Exposure based tone mapping implemented using compute shaders

ECHOES 3D VISUALIZATION

Aug 2017-Dec 2017

An interactive 3D visualization using **WebGL** with **Three.js** to render an interactive network graph with tens of thousands of nodes. Producing the graph required the development of an N-body simulation in **C++**, using an oct-tree for spatial indexing, OpenMP multithreading and a simple **OpenGL** renderer.