

SUMMARY

20+ years of experience with two main concentrations:

- **Deep experience in graphics, simulations, and game development.**
 - Flight simulator and terrain renderer: C++ and DirectX.
 - Tiled image renderers for viewing huge images: Python and OpenGL.
 - Console and VR videogames: C++ and C#/Unity.
- **Recent experience with cloud data pipelines and backend services.**
 - Pipeline to process point clouds and spherical imagery: Python and C++.
 - Workflow management systems in Python, Java, and C# with Temporal.
 - Heavy usage of AWS with Step Functions, Lambda, Batch, ECS, SNS, SQS, etc.

EXPERIENCE

AJE - AMERICAN JOURNAL EXPERTS, Durham, NC, *Editing Academic Papers* 2023 - Present
Senior Software Engineer - Python, C#, Docker, Temporal, AWS
Lead on three C# micro-services. Maintained and improved these and other microservices and backend APIs. Services supported both human and AI editing of academic papers.

BENCHSCI, Toronto, Canada, *AI drug discovery* 2022 - 2023
Senior Software Engineer - Python, Beam, BigQuery, GCP.
Wrote, debugged and extended parsers for publisher-specific XML-based academic journals. We ingested terabytes of research papers (tens of millions of documents) into BigQuery for AI processing.

TOBEVA SOFTWARE, LLC, Winchester, VA 2020 - 2022
My own consulting and contracting company.

ToneStone, Boston, MA, *Music-based VR game.*
JavaScript, C#, Unity, Meta Quest 2.
Implemented game logic and graphics. I worked directly with the CTO and the CEO. The CEO was the project leader on the original Guitar Hero, which I worked on in 2005.

The Chan Zuckerberg Initiative, *Scientific imaging.*
Python, NumPy, Dask, OpenGL
Added asynchronous tiled rendering to Napari, an existing multi-dimensional image viewer.
Created texture-atlas shader, quadtree renderer, and a monkey-patch performance monitor.

CARMERA, Inc., Brooklyn, NY, *self-driving car and mapping space.* 2017 - 2020
Senior Software Engineer - Python, C++, Docker, Step Functions, Lambda, Batch, AWS.

- Developed three generations of data pipelines in AWS.
- Workflows process point cloud (LIDAR) data and spherical imagery.
- Created a pipeline for machine learning training with TensorFlow in AWS.

MVRSimulation (formerly MetaVR), Brookline, MA, *simulations*

2011 – 2017

Lead Software Engineer- C++, Python, DirectX, Windows, AWS.

- Returned to MVRSimulation, this team as the Lead Programmer.
- Lead a team of **five engineers** responsible for three products:
 - VRSG Scene Generator, Scenario Editor, and Terrain Tools
- A clustering system in C++ using a hierarchical round-earth spatial subdivision.
- Created a web-based performance and regression monitoring system using AWS.

HOWARD HUGHES MEDICAL INSTITUTE, Ashburn, VA, *Neuroscience*.

2009 – 2011

Senior Software Engineer - C++, Python, Linux.

- Non-profit research center devoted to Neuroscience research.
- The project was FlyEM - electron microscopy imaging of the fruit fly brain.
- Extended an existing interactive image-based tool to support arbitrarily large images.
- Python using OpenGL on Linux/Mac. Rendered at 60Hz with background paging.
- Quadtree enabled viewing image stacks as large as 45000x45000x1700 (3TB)
- Created 2D and 3D visualizations of the reconstructed neurons.
- I was a co-author of a Nature paper related to this work, published in 2013.

MVRSimulation (formerly MetaVR), Brookline, MA, *Simulations*

2006 – 2009

Lead Software Engineer- C++, Python, DirectX, Windows.

- First time working at MVRSimulation.
- Added features to their flagship product: VRSG - Virtual Reality Scene Generator.
- Skinned Animation feature allowed 1000+ characters to be on screen using GPU.
- Added scenario creation tools to record and edit scenarios with vehicles and humans.
- Added embedded Python scripting engine to next-general scene generator.

HARMONIX MUSIC SYSTEMS, INC., Cambridge, MA, *AAA Console Games*

2003 – 2006

Lead Programmer - C++, Windows, PlayStation 2, Graphics.

- Implemented 2D and 3D game elements using C++.
- Lead Programmer on Guitar Hero, PlayStation 2 game published Fall 2005.
- Coordinated with game programmers, system programmers, QA, design, leads.
- Wrote a CI system to detect asset build problems and notify the submitter.
- Guitar Hero franchise had over \$1B in sales by January 2008

EDUCATION

B.S., Computer Science, HARVEY MUDD COLLEGE, Claremont, CA.