

Nathan Chortek

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EDUCATION

University of Pennsylvania

2025 - Present

M.S.E. Computer Graphics and Game Technology

University of Chicago

2015 - 2019

B.S. Computer Science, June 2019

GPA: 3.46

PROGRAMMING SKILLS

Languages: C++, GLSL, C#, TypeScript/JavaScript, Python, SQL, HTML, CSS

Tools/Frameworks: OpenGL, GLM, .NET, Ember.js, Git, JIRA, Bitbucket, Visual Studio, Qt Creator

PROJECTS

OpenGL Renderer (C++, OpenGL, GLSL, GLM)

Fall 2025

- Implemented a real-time renderer with support for a polar spherical camera model
- Created various shaders, including Blinn-Phong shading, MatCap shading, and a vertex deformation shader that dynamically offsets UV and vertex positions using Worley noise
- Added post-processing support, including a Gaussian blur filter and a Sobel edge-detection filter
- Created a custom water surface effect using fractal Perlin surflet noise combined with noise gradient computations to simulate shifting specular highlights, caustics, and model distortion

CPU Rasterizer (C++, GLM)

Fall 2025

- Implemented a real-time CPU rasterizer using intersection testing of pixel rows and triangle edges, optimized with pixel-space bounding boxes
- Added support for normal mapping, configurable anti-aliasing, texture mapping, Lambertian reflection, perspective-correct interpolation, z-buffering, and interactive camera controls

Curve Editor (C++, Eigen)

Fall 2025

- Implemented algorithms to generate control points and interpolate over various types of Bezier curves and splines, enabling animation of position, color, and orientation over time
- Added support for cubic Catmul-Rom, Hermite, and quaternion splines

PROFESSIONAL EXPERIENCE

3DL UChicago (Python, Nvdiffrastr, Kaolin, Xatlas)

Volunteer Research Assistant (Part-Time)

August 2023 – April 2024

- Investigated the impact of distinct differentiable rendering libraries on generative model outputs
- Reimplemented 3DL's *Text2Mesh* framework in Python, using Nvdiffrastr in place of Kaolin for differentiable rendering and Xatlas for mesh parameterization

Alarm.com (C#, SQL, JavaScript/TypeScript, Ember.js, .NET)

Software Engineer II

March 2020 – May 2025

- Updated a camera notification pipeline to support simultaneous object detections, requiring changes to device message processing, video file processing, and user notification services
- Implemented legal agreement tracking to enable compliant metadata gathering from video clips submitted by users as product feedback
- Managed an intern as a direct report, and trained new hires as a recurring presenter on patches, hotfixes, and late check-in processes as part of a Software Engineering onboarding initiative