Benjamin Lewis

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Profile

I am a hard working software engineer who enjoys striving to solve complicated problems. Many of the skills which I have acquired have been self taught. However, I have a formal education in Software Engineering at NCSU, which is ranked as one of the best Universities for Software Engineering. At this school I have learned about data structure and algorithms, along with the intricacies of operating systems specifically in linux, and formal software development workflows, along with minor introductions to artificial intelligence. I have a proven track record in system architecture and in computer graphics. My previous boss described me as someone who needs very little guidance, learns quickly, goes above and beyond, and works well with others.

Technical Expertise

My expertise is in point clouds and computer graphics associated with them. This involves using data structures and algorithms along with the GPU to perform complex actions on them, such as ICP to align similar clouds, interval trees to segment sections of 4D clouds based on time, octrees for quick location and exploration of points with object detection, and 2D projection to determine if two clouds of construction components will fit together correctly. As of late, I have been getting involved in Gaussian Splatting and creating AI algorithms for utilizing them in industrial settings.

Education

North Carolina State University - B.S. in Computer Science
Graduated May 2023 - 3.5 GPA
Awards: Computer Science Honors, 1st place MATLAB Cody Competition, Dean's List, 1st Place In First Year Engineering Design Day (FEDD)

Work Experience

Founder - Envision Realty Dec 2023-Present

About:
Envision Reality is a company that utilizes extremely cutting edge technology to give interior designers the ability to create photorealistic 3D renderings of rooms with no CAD experience, then utilize AI suggestions to speed up the design process through recommendations and room modification tools.
Key Responsibilities & Achievements:

- Invented brand new technology such as object detection in 3D Gaussian Splats and brand new algorithms for real time manipulation of millions of points of data.
- Researching and reading research papers relating to the tech.
- Contributing to open source libraries to remove roadblocks from the company.
- Integrated with Stripe to support subscription based payment plans.
- Opened communications with some of the companies that provide support API and communicate with them to help resolve bugs in their software.
- Created a microservice architecture that integrates with multiple third party platforms and my API.

Tech Stack:
TypeScript, Python, GLSL, MongoDB, React, Threejs, AWS, S3, Lambda, Tweenjs, Python, Tensorflow, webGPU, Nextjs, Mantine, Sendgrid, Stripe, oAuth, styled-components.

Software Engineer - Startup First Hire - PowerN Jan 2022-Dec 2023

About:
PowerN is a company that helps facilitate the construction and management of the construction process through 4D visualization and management tools, along with additional features to help with the efficient creation and correctness validation of prefabricated parts. I was hired as the first developer and created the core system which they use. Overtime, my role grew and I would manage others along with helping with hiring new developers.

Key Responsibilities & Achievements:

- Lead the technical development of the 4D visualization engine.
- Designed the file system that allows contractors to communicate with one another through a google-doc like filing system and keep tabs on failed inspections and things that are on the punchlist.
- Oversaw the development of the API and back end structure.
- Designed highly efficient algorithms that used interval-trees and argumentation for updating multiple GBs of data to reflect in the 4D engine with colors in O(log(n)) time.
- Managed a team of contractors, and PhD researchers and conducted weekly sprint meetings.
- Created an API that used AI to determine the correctness of millions of points generated from a LIDAR scan of prefab building components
- Designed a window based web UI.

Tech Stack: Javascript, Python, SQL, React, Django, AWS, S3, Lambda, Threejs, Ifcjs, Potree, styled-components, MUI

Software Developer - Advanced Security System for Childcares - Ottery Jan 2021-Dec 2023

About:
Ottery is an advanced security system designed to ensure the wellbeing of children in daycares, churches, and schools. This project awarded me the computer science honors at NCSU. The system was successfully implemented by two different organizations before its operations were discontinued to allow me to focus on more complex technology.

Key Responsibilities & Achievements:

- Led the development process, including designing a scalable architecture to handle numerous HTTP requests for secure communication between organizations.
- Designed Ducktyper for end to end input validation and well defined schemas.
- Utilized Figma for designing a user-friendly UI interface.
- Developed an email automation system to keep parents informed and engaged.

Tech Stack: JavaScript, TypeScript, React-Native, DuckTyper, Nestjs, MongoDB, AWS, S3, Figma

Open Source Contributions/Modifications:

Threejs - DragControls: added rotate mode - https://github.com/mrdoob/three.js/pull/27689
IFCjs - Raycaster improvements - https://github.com/ThatOpen/engine_components
Lumaapi - Updated client to work with aws lambda - https://github.com/envisionreality/lumaapi-python

Personal Project

DuckTyper - DTO validation tool **-** https://www.npmjs.com/package/ducktyper

- Provides runtime asserts in JS/TS projects to ensure that data follows a defined schema.
- Utilizes functional programming to provide support in both Class and Function validation.
- Successfully tested and used in Industry settings.

Tech Stack: Typescript, Class-validator, Jest