ALEX HAGIOPOL

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EXPERTISE

- Technical Leadership (listening and influencing, org-scale roadmap development and execution, talent development).
- Software Engineering (modern C++, CUDA, Python, systems design, implementation, optimization, code review, refactoring, unit testing, large codebase maintenance, version control).
- Research and Development (scientific literature review, algorithm development, algorithm implementation, algorithm evaluation, technical communication in reports and presentations).

EXPERIENCE

Meta (https://tech.fb.com/ar-vr/) — San Francisco Bay Area, CA
Staff / Principal Software Engineer, Reality Labs — Mar 2020 - Present

- Contributed technical leadership and production software to unannounced augmented reality consumer products. Led engineering efforts across multiple teams to deliver product-critical software systems. Contributed production code and technical direction in areas such as general software engineering in modern C++, performance optimization for CPUs and GPUs, classical and machine learning based computer vision algorithms.
- Led the development of a depth estimation system from research (Python prototypes of scientific papers) to delivery onto an unannounced consumer hardware product (on-device, optimized, unit-tested C++ code running in real time). Aligned with needs of partner teams building on top of the system, designed the system, wrote development roadmaps for the multiple teams developing the system, contributed much of the implementation and performance optimization, and reviewed code from >40 engineers who also contributed. Achieved a >800X end-to-end performance acceleration by reimplementing and refactoring legacy system components. Contributed to a linear systems solver, a computational geometry library, a machine learning based segmentation algorithm, and a visualization subsystem.
- Created the software engineering and documentation standards used by my >50 person org and multiple other partner teams at Meta. Individually mentored >30 engineers on programming and documentation standards.

Microsoft (https://www.microsoft.com/en-us/hololens) — San Francisco Bay Area, CA
Software Engineer, AI Perception and Mixed Reality Group — Oct 2017 - Nov 2019

- Developed scientific research into features for HoloLens 2. Contributed machine learning and computer vision research in addition to production software in modern C++, CUDA, Python, and TensorFlow.
- Created a GPU-accelerated dense 3D scene reconstruction system. Designed and implemented algorithms based on linear algebra, image processing, computational geometry, computer vision, and machine learning. This system replaced a legacy implementation in 20X fewer lines of code with 10X faster performance.
- Designed and implemented a machine learning system for high-precision human segmentation based on research in statistical learning and deep learning. Advanced the group's state-of-the-art in the problem domain and published a granted patent, US10902608B2 Segmentation for Holographic Images.
- Refactored and unit tested legacy algorithm codebases as they moved from research to production. Pioneered the group's unit testing system and deleted >3,000,000 lines of code through refactoring.

DroneDeploy (https://www.dronedeploy.com) — San Francisco Bay Area, CA
Software Engineer, Computer Vision Group — May 2016 - June 2017

- Shipped the core technology of a Series B startup to >3000 customers which helped secure Series C funding.
- Contributed to a 3D reality capture system that computes photorealistic 3D maps using 2D aerial imagery captured by drones. Unblocked shipping by increasing the reliability of this system in production from < 50% to 99.9% in 6 months.
- Contributed product features such as a CNN-based classifier for map regions of interest and a real time 2D map preview capability based on classical feature detection and matching.

PUBLICATIONS

- U.S. Patent 10902608B2, *Segmentation for Holographic Images,* 2020 (link).
- *Cracking The Coding Interview Solutions with Automated Unit Tests,* 2020 (link).
- *Review of Dense Surface Reconstruction*, 2019 (link).
- *Image Segmentation with Gaussian Mixture Models: A Hands-On Tutorial*, 2019 (link).

EDUCATION

Georgia Institute of Technology (https://www.cc.gatech.edu) — Atlanta, GA
M.Sc. in Computer Science (GPA: 3.8, Full Scholarship, Dean's List) — Dec 2016

Studied Computer Vision, Machine Learning, Computational Photography, Advanced Algorithm Design & Analysis, and Robotics.

B.Sc. in Mechanical Engineering (GPA: 3.9, Full Scholarship, Dean's List, Faculty Honors, Vice President of Tau Beta Pi)

Studied Linear Algebra, Calculus, Statistics, Numerical Methods, Data Structures, Algorithm Design & Analysis, and Robotics.