Victor Jiao

Graphics, Data Analytics, Games

vjiaoblack@gmail.com
vjiaoblack.github.io
github.com/vjiaoblack

Education

The University of Chicago '18
BS/MS in Computer Science

Courses
- Self-Driving Vehicles
- Advanced Data Analytics
- Computational Linguistics
- Statistical Machine Learning
- Speech Technologies
- Scientific Visualization
- Computer Graphics
- Game Construction
- Distributed Systems
- Parallel Computing
- Advanced C++

Activities
- ICPC Regional top 10%
- Voices in Your Head
  - semi-pro a cappella group
  - 3x top 3 nationally in ICCA

Stuyvesant High School '14

Activities
- USAJMO // top 250 nationally
- USAPhO // top 400 nationally
- Codeday NYC Co-organizer
  - promotes teen CS education
  - coordinated venues and events
  - mentored teens in programming
  - grew event 20 to 150 people

Experience

Magic Leap Graphics System Engineer July 2018 - now
- Enhanced blend functions of compositing systems to improve text clarity.
- Resolved bugs in C and C++ based systems, architecture, and algorithms.
- Gave a team-wide presentation on C++ Templates and its applications.
- Worked on researching and designing future features.

Facebook Software Engineering Intern Summer 2017
- Created a new data pipeline for storing features within Facebook's payment fraud detection system.
- Designed, researched, and coded novel data compression algorithms.
- Created a new feature generation system on top of the existing system, reducing the required feature count by an order of magnitude.

Google Software Engineering Intern Summer 2016
- Implemented the first 3D shadow mapping algorithms for Skia, Google's 2D graphics engine
- Designed novel modifications to conventional shadow mapping to allow several types of lighting
- Wrote comprehensive unit tests to analyze performance over a variety of rendering contexts.

Skills

C++, **C**, **GLSL**, Python, Haskell, Bash, Javascript
SDL2, OpenGL, NumPy, scikit-learn, MPI, MapReduce
Git, Linux, gdb, valgrind, gprof

Projects

Terrain Generation C++ | SDL2 2017 - now
- Built a flexible and powerful framework for supporting procedural terrain generation.
- Models climate, erosion, moisture, ray-casted shadows
- Runs with an efficient implementation of a ECS design pattern written with C++ templates.

Shape Defense C++ | OpenGL | SDL2 2018 - now
- Creating a tower-defense game, along with the game engine that it runs on.
- Implemented an efficient quadtree collision system for physics; optimized with CPU profiling tools.

Terrain Rendering C++ | OpenGL | Computer Graphics
- Rendered GBs of heightmap data using a LOD algorithm
- Grass, water, and rain animations; fog; and detail mapping

Ray-Tracer C | pthreads | Scientific Visualization
- 3D CPU ray-tracing engine for data, with field convolution, rendering, Marching Squares, alpha blending, line integrals
- analyzed and minimized float arithmetic error

Author Identification Python | scikit-learn | NumPy 2017
- 80th percentile in Kaggle's Spooky Identification challenge
- identify author (out of 3) of short 100-character snippets
- Used Naive Bayes, n-grams, TF-IDF, SVMs to analyze data
- using statistical methods provided human-readable results

Weather Modeling Python | scikit-learn | NumPy 2017
- mined and cleaned public weather records from airports
- applied hidden markov models and data transformations to create a weather predictor; it self-learned pressure systems

Multi-Paxos Python | Distributed Systems
- Implemented multi-paxos, a distributed algorithm for consistent and fault-tolerant key-value storage.
- more efficient variant of the classic Paxos algorithm.

Parallel Work Queues C | pthreads | Parallel Computing
- designed and implemented a system to handle balancing work loads over multiple threads
- tested it against different types of load imbalances using slurm, and bash scripts