(916) 673-8854 **Daniel Bolya** dbolya@ucdavis.edu
Website • GitHub Davis, California

TECHNICAL SKILLS

Programming Languages
C++, Python, Java, JavaScript, Lua

Other Languages
SQL, HTML, CSS, MATLAB, LaTeX

Libraries
C++ Caffe, CUDA, OpenCV, SDL, OpenGL,
Py PyTorch, TensorFlow, Numpy
JS Node.js, jQuery

Utilities
Git, PostgreSQL, AWS

Interests
Computer Vision, Machine Learning, Computer Graphics, Game Engine Development, GPU Acceleration

RESEARCH

Single Shot Segmenter (June 2018 – Ongoing) [Code]
- Real-time instance segmentation using a novel prototype-based approach
- Based on SSD, but general enough to be added to most object detectors
- Currently four times as fast as the current state-of-the-art, and twice as fast as the previous

Daniel Bolya, Fanyi Xiao, Yong Jae Lee. *SSS: Single Shot Segmenter*. In Progress.

Handwritten Math Equation Solver (November 2015 – April 2016) [Code, Abstract]
- GPU accelerated pipeline starting with an image of the problem outputting computed answer
- Supports basic arithmetic, stacked multiplication, long division, fractions, and exponents
- Uses a total of 57 convolutional neural networks in 19 committees trained on modified inputs
- 1st place computer science in the Sacramento STEM Fair, finalist at the Intel International Science and Engineering Fair, and honor's mention at the California State Science Fair

Daniel Bolya, Dylan McLeod. *Using Artificial Intelligence Systems for Autonomous Visual Comprehension and Handwriting Generation*. Presented at ISEF 2016.

PROJECTS

3D Software Renderer (September 2018 – December 2018)
- 3D mesh renderer made from scratch in C++ and access to a pixel buffer
- Supports arbitrary vertex and fragment shaders, textures, and obj file loading
- See website for sample renders

3D Voxel Game Engine (March 2015 – July 2016, Team of 2) [Code]
- Optimized procedurally-generated game engine in C++ using SDL and OpenGL
- Uses in-house scripting based on Lua for higher level programming
- Spans 20,000 lines of code and supports custom terrain generation with our own noise library, plant generation, efficient entity collision, animation, custom rendering, and more
- Runs at over 40 FPS on a Chromebook (Acer C720) and 1000 fps on a GTX 1070

Data Mining Lead Programmer for Trivia App (June 2016 – September 2018, Team of 3)
- Mining gigabytes of data from Wikipedia dumps and storing them in SQL databases
- All operations multithreaded and in C++ and multiprocessed in Python
- Wrote an in-house DB query language to easily convert data into questions

Alexa-Enabled Trigram Compliment Generator [HackDavis] (January 2017, Team of 3) [Code]
- Animated interface to an Amazon Alexa skill called Proton Positivity Generator
- Programmed the front-end and back-end in Node.js and the trigrams in JavaScript
- Managed the Amazon web services used (EC2, Lambda, Alexa Voice Service)
- Made in 24 hours at Davis Hackathon [DevPost]

AWARDS

Intel International Science and Engineering Fair (ISEF) Finalist **2016**
Sacramento STEM Fair 1st Place Category Award in Math and CS **2016**
Sacramento STEM Fair 3rd Place Grand Prize Award **2016**
California State Science Fair Honerable Mention **2016**
Intel Excellence in Computer Science **2016**
Handwritten Math Equation Solver
HackDavis Honorable Mention **2017**
Alexa-Enabled Trigram Compliment Generator

EDUCATION

University of California Davis **September 2016 – March 2019**
Bachelor of Science, Computer Science Major 3.98 Total / 4.00 Major GPA
Mathematics Minor

Relevant Coursework

[A+] ECS 171 (Machine Learning) MAT 67 (Modern Linear Algebra) [A+]
[A] ECS 174 (Computer Vision) MAT 167 (Applied Linear Algebra) [A+]
[A] ECS 189G (Natural Language Processing)
[*] ECS 175 (Computer Graphics) * In Progress

EMPLOYMENT

University of California, Davis **June 2018 – Ongoing**
Undergraduate Student Researcher