Brian Carlson

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EDUCATION

BS / Computer Science + Math Minor

BS / Computer Engineering

University of Kentucky, *2019*

TECHANICAL SKILLS

Program Languages:

- Python
- C++
- Java
- PHP
- MySQL
- C
- Mathematica

- **Additional Languages**: Perl, bash, Angular 6, Rust, HTML, CSS, Visual Basic, Prolog, Lisp, Kotlin, C#/.NET
- **Operating Systems**: Windows, Arch, Ubuntu, Raspbian, Kali Linux, Fedora
- **Tools**: Amazon Web Services, Google Cloud, Docker, Kubernetes, Tensorflow, Keras, MongoDB
- **Electronics Experience**: Raspberry Pi, Arduino Uno, Particle Photon, ESP8266, Xilinx FPGA, ARM
- **Other**: CUDA, Agile, Flask, CMake, Unity, Autodesk Inventor, Verilog

Software engineer with a background in both software and hardware applications. Focus on integrating machine learning and artificial intelligence into software. Seeking automation role to free up repetitive software or hardware tasks for accelerating higher-level processes.

PROFESSIONAL EXPERIENCE

Lucra Machina / August 2019 – Present

- CEO and founder of early stage startup focused on an AI – first approach to an automated cryptocurrency investing platform
- Built the technology, meeting with partners from eTrade and Uber

Don Fishback: ODDS / February 2019 – Present

- Used Artificial Intelligence to improve stock options trading strategies. Using data from the OVS database, I developed a returns prediction engine for evaluating the feasibility of options trading strategies.
- Created a backtesting framework to improve stock option ranking metric.
- Designed machine learning models for risk management

Institute for Pharmaceutical Outcomes and Policy / February - September 2019

- Developed machine learning models for detecting anomalies in healthcare charge records. Performed analysis on 20% of the US's medical records
- Created interactive data visualizations showing the movements of opioid buyers trying to circumvent the restrictions present in their regions.

84.51° / June 2018 – August 2018

- Developed the orchestration layer of a tool for enabling a cloud-based data science pipeline. Product was built to integrate with multiple data sources using Google Cloud computational resources.
- Led inter-team communication between my team and the teams building the services our product used.
- Participated in discussions with data scientists and engineers about product including security, optimization, and product integration

TWW Family Holdings L.L.L.P. / January 2018 – May 2018

- Built a high-availability, highly parallel, intelligent cryptocurrency bot trading platform from the ground up
- Process involved stress testing, parallel programming, cloud computing, machine learning, and artificial intelligence
- Framework was fully autonomous. Implemented fail-safes, exit strategies, arbitrage exploitation, and a simple AI for risk management

United States Court of Appeals for the Sixth Circuit / June 2017 – August 2017

- Developed and assessed the security policies and the SSP for the IT Security Scorecard of the Sixth Circuit. After the OPM breach in 2015, changes were finally being implemented into the Federal court system. I was responsible for ensuring that measures were in place to prevent such a breach through the court system.
- Developed document generation software for accelerating completion of required security policy documentation for the 22 lower District Courts
- Released open source software for templated document generation

Belcan Engineering / January 2017 – May 2017

- Assessed jet engine specifications for quality assessment
- Developed tools to accelerate the anomaly detection process to ensure designs met government and industry requirements
- Automated error reporting, saving my division 7 hours each day

Carlson Software / May 2015 – August 2015 / May 2016 – August 2016

- Built CAD-like polyline drawing capabilities into a commercial graphics engine that is used for software
- Designed optimization algorithms used in mining engineering software
- Developed faster algorithms for 3D point clouds using a custom KD-tree used in mining software.

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LEADERSHIP/INVOLVEMENT

Vice President of the UKY Association for Computing Machinery
August 2017 – May 2019

- Organized social and technical events such as workshops, movie night, etc.
- Fostered a positive and inclusive "hacker" and "maker" computing culture

UKY Hackathon Organizer: CatHacks
January 2019 – May 2019

- Kentucky's largest MLH hackathon
- Gathered sponsors, marketed to students, managed finances, led organizing team

March Hack Madness Lead Organizer
August 2018 – March 2019

- Arranged technical workshops for the month of March
- Helped students build coding portfolios through projects

UKY ACM ICPC Programming Team
August 2015 – May 2019

- Solved algorithmic programming practice problems
- Competed in competitions ranging from ACM ICPC to IEEEXtreme
- Won 6th place in the USA in IEEEXtreme 2017

PROJECTS/HACKATHONS

Distilled: An ERP system for distilleries / January 2019 – May 2019

- Angular 6 frontend and Java Spring backend, hosted on AWS Beanstalk
- Manages resource tracking, planning, and prediction for barrels, grains, and products o Backend provides APIs for extensibility

AlgoCraft: Teaching Algorithms with Minecraft / December 2018 – May 2019

- Present o Project Malmo and Minecraft provide a platform for teaching basic programming, algorithms, and reinforcement learning
- Packaged into Docker container, deployed to Google Cloud, spawns a new container instance for each user

K9 Robodog / October 2017 – December 2018

- Building a robotic dog that can find its charger, act autonomously, and learn actions
- Implemented the TAMER framework for teaching the dog
- Using OpenCV and Convolutional Neural Networks for facial recognition

Pokébot / October 2017 – December 2017

- Building an agent to automatically login, pick a team, setup a match, and play matches on pokemonshowdown.com
- Uses interactive machine learning tools to allow it to learn optimal gameplay from demonstration and from positive/negative reward.

Lightswitchd / HackTheHome September 2017

- Built IoT device that interfaces with AC power mains to allow complete control wirelessly
- Built custom gesture system using a Pimoroni Skywriter and their python library
- Built React.js UI controls with cross-platform compatibility
- Built webserver to handle custom API requests and allow internal networking
- Team of 5, I played a part in all designs and brought them all together

DocxMerge, DocxTemplateManager / Summer 2017

- Created libraries for managing and merging word documents. Available on PyPi.
- Created scripts that allowed a user to pass templated docx files and an Excel spreadsheet to generate documents, tracking changes.

Confluency / Summer 2017

- Created a simple library for accessing the Confluence REST API. Available on PyPi
- Uses simple caching to accelerate repeated requests

Photoshoplifting: Automated Content Aware Fill / CatHacks III April 2017

- Built an automated version of Adobe Photoshop's content aware fill using Mathematica cloud, Django, and scikit-image
- Won an award for "Best use of Wolfram Technologies"

MedCheck: Alexa-enabled medication assistant / VandyHacks III October 2016

- Led a team of 4 to build an Alexa app, a website, a Telegram bot, an IoT pillbox, and the infrastructure to support communication between all these services and devices
- Built AWS Lambda functions that for interfacing with Firebase database and Amazon Alexa
- Combined the different components into one unified and working project
- Won an award for "Most Impactful Hack"

RealiType / January 2015

- Developed a program in Unity that used the Kinect V2 and Oculus DK2 to allow the user to interact with a virtual environment using natural gestures without the need for a controller
- Led a team of 3 over the course of 3 weeks with no previous Kinect, Oculus, or Unity experience