

Julius Hernandez-Alvarado

Data Analytics Engineer | Sacramento, CA | j.data.engineer@gmail.com | 1-408-890-8044

My Portfolio App:

calgeek.com

I'm a Tableau Data Analyst, MySQL Developer & Python Engineer immensely passionate about quality assurance, building interactive data visualizations, & engineering automated data processing systems

I have 8 years of Software Development, Analytics & Engineering experience.

Willing to relocate: Anywhere

Authorized to work in the US for any employer

Work Experience

Analytics Engineer

Apple | Cupertino, CA | Jan.2021 – Present

I worked in a Data Collections team for the Siri Artificial Intelligence and Machine Learning Engineering Group. I helped collect & process terabytes of text, image, and video data across a cluster of 12+ machines located in The United States & China. I utilized my skills in Data Engineering, Data Analysis, and Quality Assurance to help implement systems that compute statistics, help operationalize machine learning algorithms, and stream files on disc to our Amazon Web Services s3 buckets.

Here are high-level descriptions of a few projects I've worked on at Apple:

- I built a data pipeline in Python to generate the correct permutation of specifications set by our Machine Learning engineers. It then uploaded these files to the cloud. I took thousands of videos and pictures of app clip codes (similar to QR codes) at different angles, lighting, distance, etc. After generating this data, I used Python to make sure all specifications were met, generate a report, and merge sort the files in the correct order to upload to iCloud.
- I built many data visualizations using the Tableau platform to render various statistics, metrics, and key performance indicators for our machine learning

algorithms and data processing systems so that leadership could analyze the results of our data collections projects.

- I re-factored a pre-built data processing system in Python that scanned thousands of videos on disk and uploaded to AWS S3 & MySQL. This system initially ran a single process to scan data from a single machine on our cluster. This required hours for our processing system to complete. I re-wrote it to become a multi-processor script so that each scan could run in parallel. Rather than each nodes' data being scanned one at a time, all the nodes' data were scanned in parallel. I also implemented a logging system so we could monitor the progress.
- I've written thousands of lines of SQL to analyze the results of data pipelines for our data collections projects and to compute statistics for leadership to analyze. This includes stored procedures, tables, common table expressions, prepared statements, aggregations, window functions, and views (for Tableau).

These are my responsibilities at Apple:

- Data Collection & Management for the AI/ML Engineering Operations Group.
- Contributing to the development of AI/ML algorithms across all of Apple's products.
- Driving critical data collection projects that provide data at scale for engineering teams to build robust ML algorithms for features to be released to millions of users worldwide via the Apple platform.
- Developing data collection protocols.
- Managing programs with external vendors and internal participants.
- Using data-validation tools.
- Working with engineering teams until the ML algorithm is accurately implemented.

The primary tech I use:

Core Computer Science Data Structures & Algorithms (i.e., leetcode), Python, pandas, NumPy, MySQL, Excel, Tableau Desktop, Tableau Server, Statistics, AWS, and Airflow

Data Engineer & Data Analyst

Unemployed | Sacramento, CA | July 2020 to Dec.2020 (6 months)

Aug.2020-Dec.2020.

I was Applying to jobs while balancing 10-19 hours of study&practice a day on:

- Cloud Engineering: Google Cloud Platform (e.g., Kafka, IAM, VMs, etc.)
- Big Data: BigQuery, Hadoop, Spark
- Software Engineering: PHP, Python, Scala
- Data Visualization: Data Studio,
- Data Analysis: Python (PySpark, Pandas) & SQL(Spark/Hadoop/MySQL/BigQuery)

- Computer Science: DC/DP Recursion, Graph Theory, Tree's, Problem Solving,
- Applied AI/ML: Google's AI Platform, BigQueryML
- Math: Probability & Statistics,
- Certifications (studied, not taken): Zend Certified PHP Engineer, Google Certified Data Engineer.

June 2020-August 2020.

I built a coder match cloud app (github.com/Hack-Match). How I built it:

- I used a PHP micro framework called slim3 to build the API.
- I implemented the matching with $O(n)$, $O(1)$, and recursive algorithms.
- I used PDO to make client-side SQL queries.
- I used SQL (MySQL/MariaDB) to manage the remote and local db server
- I used session to maintain state across multiple requests.
- I built the UI in AngularJS 1.7 and Material design.
- I had to learn cloud engineering on the Google Cloud Platform to get everything to work. This included learning how to manage instances of Cloud SQL, App Engine, Identification and Access Management, Operations (such as logs and tracing), the cloud shell, billing, and a ton of other stuff.

July 2020.

I got hired for a few freelance jobs. The software I built for these jobs:

- StaticSound.co: a single digital product micro e-commerce site. I built it in 4 days using a 3rd party payment API, Bootstrap & native PHP.
- Custom file uploader app: after a user uploaded a CSV, PHP Extracted the file from disk, transformed it to an in-memory data structure and loaded it into a sql db. The app then used a JavaScript UI component library to render the data in HTML. I built it in 8 days using Laravel & React.
- Excel spreadsheet scraper: nightly upload of employee clock ins/outs that PHP Extracted, Transformed, and Loaded. I built it in 2 days using PhpSpreadsheets.

Data Engineer

Redstone Print & Mail | [Sacramento, CA](#) | [May 2018 to June 2020 \(2 years\)](#)

In June 2020 I lost this job due to the corona-virus pandemic)':

Redstone did not need big data tech for any practical business problems. We printed & mailed 2,000,000 to 4,000,000 pieces of mail a month. Day to Day I did a bit of web development, a bit of software engineering, a bit USPS data work, a lot of data analysis, a lot of scripting, and a lot of learning. I helped wire up, process, and manage the Inventory, Accounting, Mailing, and Customer data to their internal business systems. So, I had to learn a LOT about Inventory, Accounting, USPS & Direct Mail, and their

customers. I used SQL a lot! I also used PHP to do what Python/R/Scala/Java are typically used for. I found that PHP can do anything Python/R/Scala/Java could do so there was no need to use them. Programming languages are just hammers to fix business problems, what matters is who is wielding the hammer. My primary task was automation.

These were the skills I used to reduce costs & save time:

- **User Interface Engineering:** for custom software, dashboards, data visualizations, reporting systems, and tools I built. This was so my co-workers and bosses had a GUI to interact with my server side scripts and algorithms.
- **Bot Development:** to crawl sites, scrape data, download files, and type into forms. This was to automate repetitive time-consuming tasks, retrieve information from the web, and assist the automated data processing systems.
- **Server and File System Engineering:** to build Command Line Interface and Application Programming Interface apps that extracted, transformed, loaded, created, read, updated, and deleted records from files on disk and SQL Server. This was to build data pipelines that interfaced with our internal web application on Linux and our data lake on Windows 10 Server. This code was invoked from either PowerShell scripts, batch files, the windows task scheduler, user interaction, or responses from 3rd party API's.
- **Database Scripting:** via saved template SQL queries in SQL Server Management studio and stored procedures. I also built Data Model Classes in PHP 7 to interact with SQL Server and files on disk(eg .csv, .pdf, .txt, .xls) as well. This was to automate tasks, reports, and audits. These scripts also did statistical computing against our internal jobs data to help company stakeholders make business decisions.
- **Algorithm Implementation:** that always had a time complexity of $O(n)$, $O(n^2)$, $O(\log(n))$ or $O(1)$ or a combination of the aforementioned. I implemented recursive & iterative algorithms in PHP 7 for custom extraction, transformation, and loading operations. This was to help the company process and integrate hundreds of weekly raw CSV, text, and PDF files into our data pipeline.
- **Data Management, Analysis, & Processing:** via Microsoft Excel and other data software (for mailing, inventory, and accounting), Transact-SQL, SQL Server Management Studio, PowerShell Scripts, and xBase/FoxPro. This was to make sure addresses in data files were accurate, forecast inventory needs, and determine costs.
- **Quality Assurance:** by Unit Testing the software I wrote using PHPUnit to detect bugs and prepare for edge cases using Test Driven and Behavior driven practices to the best of my abilities. This was to increase the reliability of the software systems I built.

Full Stack Engineer

Mhetadata | Sacramento, CA | May 2018 to July 2019 (1 year 2 months)

This was my part time job. I helped this company generate revenue by re-building variable image software that downloaded about 500,000+ images per month. Each customer usually paid for about 10,000 images. The company had software that was being used to do this before I was hired, so I studied that software's source code and re-built it from the ground up.

Metrics (1. Original software VS. 2. My re-build):

1. 24 mins to download 2,000 images
 2. 2 mins to download 2,000 images
-
1. 100,000 downloads per month
 2. 500,000+ downloads per month
-
1. Roughly 45 mins to manually run 1 job using a web interface (making manual requests per queue, moving files around, and renaming files via manual SQL queries)
 2. Less than 4 mins completely automated (automated batch processing, automated file system ops, and client-side queries in PHP to rename files)

I used the following skills to do this:

- **Product Development:** via AngularJS 1.6.5, PHP 7.1, T-SQL, SQL Server Database Engine, HTML/ CSS/JS, Material Design, API development, Open-Source PHP Libraries via composer, and computer science algorithms & data structures.
- **Algorithm Implementation:** that had a time complexity of $O(n*x) + O(1)$... n is the number of elements in the data set and x is the number of columns(which was always less than 50). I used calculus to figure out a formula to maintain a constant offset between batch downloads (Series & Sequences from Integral Calculus).
- **Asynchronous Programming:** to make heavy use of Concurrent non-blocking IO. This is how I decreased the download times of the application.
- **User Experience Engineering:** to create an intuitive and beautiful user interface that customers interacted with when making an order. I built custom animations, on hover events for navigation, and utilized 2-way databinding for real-time DOM manipulation.

Full Stack Developer

Lab 916 | Sacramento, CA | December 2017 to April 2018 (5 months)

Built a MySQL database on Google Cloud SQL. Built an application programming interface to Create, Read, Update, and Delete data from Amazon API Web Services.

Wrote database scripts & SQL queries to parse & manage data. Made a Data Reporting system via Google Data Studio that I wired up to our Cloud SQL database. Made a web app using Amazon authentication for clients to login to and see KPIs. Made both basic web forms & highly advanced animated web forms for marketing. Analyzed data in Microsoft Excel to extract useful metrics. Built a lot of sales websites for our digital marketing campaigns.

Web Developer

Freelance | Manteca, CA | January 2015 to December 2017 (2 years 11 months)

I worked for The San Joaquin County Department of Education, Australian Products Co., T3 Direct Marketing, and multiple web development agencies & small businesses. I also volunteered for a few startups. According to [GitHub.com/ideaguy3d](https://github.com/ideaguy3d), from 2015-2017, I worked on about 30 personal projects (to learn in hopes of finding a job). Over these 3 years that accumulates to about 3,000-6,000 hours of experience (4-8 hours per day over 3 years).

Tools I have experience using to build web applications during this time was:

C#, Node.js, JavaScript, jQuery, HTML5, CSS3, SASS/LESS, webpack/grunt/gulp, PHP 5, PHP 7, Slim, ASP.NET, Heroku, AngularJS & Angular, React, Express, Photoshop, Adobe XD, Illustrator, Unity3D WebGL exports, MongoDB, MySQL, Firebase, FTP, Various Web Hosting Providers, WordPress/Drupal/other content management systems, Laravel, TypeScript, and endless amounts of plugins/modules/libraries/etc. for the core tech (e.g. PHP, JavaScript/Node.js, C#, Unity3D)

From Aug.2016-Oct.2016:

I was in The US Navy's Bootcamp in the Advanced Electronics & Computer Field (AECF rate). I didn't make it past bootcamp. Upon my return from bootcamp I was immediately hired by the San Joaquin County Department of Education.

Virtual Reality Engineer

Sci Interactive LLC. | San Jose, CA | November 2013 to December 2014

This was my Start Up Company. I dropped out of college to build this software. I used C#, Blender3D, and Unity3D to develop a virtual world to build vocabulary. I used to use a TON of vocabulary builder apps to of course... build my vocabulary. All the vocabulary

builder apps I used were 2D. So, I was going to combine the best aspects of all the apps I was using and re-build them in 3D.

To build this software I implemented physics algorithms(for rotation, orbit, 3D grids systems, velocity, vectors, etc.) in C#. I implemented graphical user interfaces in 3 dimensions using C#. I built 3 dimensional quizzes, flashcards, etc. and copied features from other apps and combined them. The user was a 3D avatar, so it felt like a game, but it wasn't (although there were some game aspects e.g., a point system, rewards, etc.). The user would walk around a 3D world to learn new vocabulary.

I did all the 3D modeling & animation in Blender3D. I used adobe software for textures and sprites (for the User Interface). Then would import into Unity3D to write code that would use these 3D assets.

The most important feature of the app I was trying to implement in C# was the ability for a user to type a sentence using a word they just learned and have the app verify the word was being used correctly. I spent roughly 400 hours studying the Oxford English Grammar textbook to learn how to parse natural language. I did figure out how to get custom Natural Language Processing algorithms to work most of the time if the verb tense didn't change.

Say the user just learned the word 'verisimilitude', The app would ask the user "Now use the word 'verisimilitude' in a sentence"...

The user would then type into a 3-dimensional text area, click "Enter" and if the user used the word correctly the app would say "Good Job", if the user used the word incorrectly the app would fix the sentence and explain why the sentence was wrong. I didn't know it at the time, but this is actually a field of Artificial Intelligence called NLP. I just thought it would increase the sales of my app if I could get this feature to work. I spent well over 1,000 hours trying to get it to work. In a way, this feature also made me a self-taught artificial intelligence engineer. Natural Language Processing was the most mind-bending engineering problem I've ever tried to solve. I realized how amazing natural human language is... to us, natural language just "makes sense", to a computer program it is incredibly complex stuff to make sense of natural language.

Overall, I spent 4,000+ hours working on this startup over these 14 months. All the investors (Y Combinator, Angels, etc.) rejected my application for investment because I couldn't figure out how to get an online demo up and running for them to use it.

Education

Master's degree Equivalent in Software Engineering

Via an Autodidactic Education | Internet | Jan.2016 to Dec.2017

Over 3,000 hours of Study, Practice, and Experience in 2 years

Bachelor's degree Equivalent in Computer Science

Via an Autodidactic Education | Internet | Dec.2012 to Dec.2015

Over 4,500 hours of Study, Practice, and Experience in 3 years

Dropout in Computer Science

San Jose State University | San Jose, CA | January 2012 to August 2012 (9 months)

Took 20 Semester Units (About 1,600 hours of lecture, study & practice)

Transfer in Computer Science

California Community Colleges | California | Aug.2007 to Dec.2012 (5 years 4 months)

Took 70 Semester Units (About 5,600 hours of lecture, study & practice)

1 unit = 1 hour of lecture + 4 hours of study & practice outside of lecture over 16 weeks(a semester)

Military Service

Branch: US Navy

Rank: E3

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