Fernando Gómez Herrera

https://gomezhyuuga.github.io/

Summary

I am a BSc. & MSc. Software Engineer with wide experience in web technologies and recently with Machine Learning. I have been working both in startups and as a freelance for almost 4 years creating robust web applications. Solid background in Computer Science, leading small teams, working either remotely or on-site, and enthusiast of open-source. I love to practice yoga; to take long walks; I'm a bookworm, geek, anime fan and tech entrepreneur.

Education

MSc Computer Science – Tecnologico de Monterrey, Mexico December 2018
Summer internship – Stevens Institute of Technology, New York Area June 2017
BSc Computer Science – Tecnologico de Monterrey, Mexico December 2016

Professional Certifications

- **IBM Master the Mainframe Part 2** – IBM, Acclaim, 2018
- **React.js Intermediate Level** – Wizeline, 2018
- **Google Cloud Platform Essentials** – Qwiklabs, 2018
- **HTML5 & IE9 Developer Fundamentals**– Microsoft, 2012
- **R, Python for Data Science, Ruby on Rails** – Data Camp and CodeSchool

Specialization Overview

Operating systems	macOS, Linux/Unix, Mainframe z/OS, MS-Windows
Languages	Typescript, JavaScript, Python, Ruby, Java, Clojure, Erlang, C#, C, SQL
Internet / Web	nginx, Apache, Heroku, Github Pages, Tomcat, Glassfish
Programming/Tools	vim, VS Code, Webpack, Gulp, Babel, Prettier, Rubocop, Pylint, TSLint, ESLint, Jekyll
Distributed Systems	REST, SOAP, EJB, RMI, CORBA, JMS, IBM MQ, WBI
Libraries	React.js, Redux, Redux Sagas, Ruby on Rails, Express, Lodash, jQuery, Jest, Mocha, Enzyme, ant design, Semantic UI, Bootstrap, Hibernate
Machine Learning	Deep Learning, Keras, Weka, Scikit-Learn, Numpy, Pandas, Tableau Prep, Tableau, One/Two Class Classification, Image Classification
Databases	MySQL, PostgreSQL
NoSQL	Firebase, MongoDB, CouchDB
Cloud	Google Cloud Platform: GCE, Stackdriver, App Engine, Cloud Functions, and networking AWS: EC2, Route 53, SES, S3, Lambda functions, EBS, RDS

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Professional Experience

Project: Web Bot Detection January 2016 – December 2018

https://gomezhyuuga.github.io/thesis

Technologies: J48, Binary Classification, One Class Classification, Pattern Mining, Tableau, Tableau Prep, Python, Jupyter, Pandas, Numpy, C#

Thesis project. Detection of Sophisticated Invalid Traffic (SIVT) for websites using Machine Learning algorithms. In addition, using pattern mining to support marketing experts in Web traffic segmentation analysis.

- Binary Classification to detect well-known bots. Achieved a ROC AUC of 0.844.
- One-Class Classification to detect abnormal traffic. Achieved a ROC AUC of 0.923.
- Classification algorithms programmed in C# and Python.
- Used Keras to perform classification experiments.
- Performed training and validation with k-Fold-Cross-Validation.
- Data pre-processing using Python, Pandas and Tableau Prep.
- Data Exploratory Analysis using Tableau.

Project: Bank Transactions Application May 2018

https://gomezhyuuga.github.io/bank-app

Technologies: React 16, Ruby, Sinatra, Clearbit's API, Plaid API, RSpec, Capybara, Typescript

Application to list bank transactions using Plaid as account provider. It connects to the Plaid service to gather bank transactions and then uses Clearbit's Enrich API to fetch more information about the company who charged the transaction.

- Developed both Front and Back-end using React 16 and Sinatra, respectively.
- Included Unit testing with RSpec.
- Covered Integration testing with Capybara.

Project: Strategic Pricing Prediction June 2018 – May 2018

Technologies: Python, Scikit-Learn, mlxtend, Regression algorithms, Optimization Algorithms, Tableau, Pandas, Numpy.

Machine Learning solution for product pricing prediction at convenience stores.

- Regression problem. Created a model to predict a continuous value given time series data.
- Combined multiple regression models like Linear Regression, ADR, Random Forest Regressor and SVM Linear, using ensemble methods.
- Created a stacking regressor and then using a Sequential Least Squares Programming (SLSQP) optimizer to obtain the price in which individual products should be sold, thus, optimizing the gross profit.
- Proposed new data attributes by using Feature Engineering.
- Implemented several business constrains in the optimizer.

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Project: Toxic Comment Classification June 2018 – May 2018
Technologies: Keras, Python, Deep Learning, Pandas, Numpy, ML Classification, Tableau

Classification of online *negative* text comments into a group of *toxic* categories: *toxic, severe toxic, obscene, threat, insult, identity hate*. This project was part of Kaggle's *Toxic Comment Classification Challenge.*

- Used Deep Learning techniques to build a classifier that would be capable of categorize comments into seven categories.
- I created the model with Keras using the *orthogonalization method* in order to improve the performance (high precision, low variance).
- The best configuration was a LSTM 64-layer network, using L1 regularization, and Adam optimizer. Testing accuracy of 90.2%
- Training the model took 33.33 minutes.

Project: Web Traffic Visualization Tool | Client: NIC México June 2017 – January 2018
https://gomezhyuuga.github.io/thesis
Technologies: React.js, Redux, Cytoscape, D3.js, Python, Flask, PHP, Matomo

Web application that reads Web Analytics data from Matomo (a Google Analytics open-source alternative) and combines multiple reports into a single one, providing information about website visit interactions, goal pages and overall site metrics.

- It was part of my Master's thesis project
- Sold to a big Mexican Internet services provider
- The application was used successfully to visualize and contrast Bot vs Human traffic
- I developed both Front-End (using React.js) and Back-End (Flask server)
- Created the visualizations using Cytoscape as library to render graphs
- Integrated a feature to explore in detail individual visits and create a navigation graph
- I started the tool in my internship at Stevens Institute of Technology

Project: IQR Knapsack Hyper-Heuristic Research Paper October 2017
https://gomezhyuuga.github.io/IQR-knapsack
Technologies: Java, Statistics, Machine Learning algorithms

Research paper presented at the *16th Mexican International Conference on Artificial Intelligence*. Co-authors: Rodolfo A. Ramírez-Valenzuela, José Carlos Ortiz-Bayliss, Ivan Amaya, and Hugo Terashima-Marín.
The article proposes a novel approach for solving the Knapsack 0-1 problem; a Hyper Heuristic that uses information of the items profit and weight distributions and choses the best item so at the end you would be able to get the optimal maximum profit achievable.

- I got the idea and implemented two of the three heuristics presented in the paper.
- Main-author of the paper. Led the writing and presentation on the conference.

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Project: Vehicle Simulator for a toll system | Client: Thales August 2016 – December 2016
Technologies: React.js, Node.js, RaspberryPi, PLCs

Thales is a French multinational company that designs and builds electrical systems and provides services for the aerospace, defense, transportation and security markets.

I created a simulator able to perform volume tests automatically for a toll system. The simulator was connected to Thales's PLCs (Programmable Logic Controller) which received information from various sensors for pre-classification and post-classification of vehicles. Create a simulator that is able to perform volume tests automatically

- Developed a REST server which connected and controlled the PLC, sending information about several vehicle sensors.
- Designed the application.
- Led the client meetings and requirements acquisition.
- Setup and configured a RaspberryPi to deploy the final product.

Software Engineer Contractor July 2016 – November 2016
Hewlett Packard Enterprise
Project: Value at Risk Portfolio Analysis July 2016 – November 2016
Technologies: JavaScript, Node.js, C++, Express, Grommet UI, React.js, InVision, Sketch

Hewlett Packard Enterprise Palo Alto Research Labs. Value at Risk Analysis to improve portfolio investments.

- Designed the Front-End views using Sketch
- Integrated Sketch designs into InVision to create an interactive prototype
- Implemented the design into a web application using React.js and Grommet UI (developed by HPE) as UI framework
- Back-end server developed using Node.js and Express
- Designed the main application architecture
- Leading the presentations of the product to the research team
- Collaboration with Ph.Ds. researchers on Machine Learning
- Development collaboration to integrate existing ML models in C++ with Node.js
- Deployed the application internally in the HPE Labs servers

Front-End Developer July 2015 – September 2015
Intelimétrica
Project: House Pricing July 2015 – September 2015
Technologies: JavaScript, React.js, Google Maps API, Selenium, Ruby on Rails

Intelimétrica provides business solutions that take advantage of current business data and make it *actionable*. House pricing solutions for a government sector was the main project I was involved into:

- Development of real estate dynamic pricing maps using React.js and the Google Maps API.
- Leading a Quality Assurance culture. Implementation of E2E (end-to-end) tests to ensure quality of the main business product.
- Use of Selenium to perform acceptance tests.

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Full-Stack Developer June 2013 – August 2015
Summa Di Saas
Project: Karuna (OBGYN system) July 2013 – August 2015
Technologies: JavaScript, jQuery, Ruby on Rails, CouchDB, AWS, Capistrano, Basecamp, Bootstrap

Karuna is a system for obstetricians and gynecologists, helping the medic in keeping track of patients, making appointments, monitor pregnant women and schedule childbirths.

- Lead developer supporting bugfixes and creation of new modules for the system.
- Advisor for the company about web technologies and support with the client.
- Introduced AWS to the company and used it as a standard to deploy this and other projects.
- Setup of all AWS services: EC2, SES, Route 53, and S3.
- Achieved to become Product Manager and own the project later on as a freelance.

Project: MUTEC August 2013 – September 2013
Technologies: Django, Python, JavaScript, Jinja, jQuery, HTML5, CSS, Bootstrap

Official website for the Museum (MUTEC) of the Mexican country-level electric power supplier.

- HTML and Jinja implementation of design mockups
- Developed a CMS-like for the museum news
- Deployed the application in AWS

Freelance and personal projects July 2013 – Current
Involved in several projects including: web design, e-commerce sites, full-stack development, and acting as a consultant for tech-starters.

Project: Text Adventure Game January 2016 – May 2016
https://gomezhyuuga.github.io/text-adventure
Technologies: Sinatra, Ruby, SQLite, jQuery, JavaScript, HTML

Web application that allows playing the revised and improved version of "*Werewolves and Wanderer*" text adventure game as explained by Tim Hartnell in the first 15 chapters of his 1983 book entitled: *Creating Adventure Games on Your Computer*.

- Enforced a better game architecture using Design Patterns (like State Pattern, Composition, DSL).
- Designed the UI for the game, trying to be very close to the original game.
- Developed the core logic for the game and basic player actions like fighting, consume items from inventory and pick up items from the game rooms.

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Project: MedHauss (formerly Rogeri) June 2015 – August 2015
https://medhauss.com.mx/
Technologies: Shopify, Liquid, JavaScript, HTML, CSS, jQuery

E-commerce website selling scrubs and nursing uniforms.

- Development of the business' e-commerce website
- Created a custom layout using Liquid template system
- Implemented payment methods using Conekta (a Mexican provider)

Project: Dots and Boxes January 2015 – May 2015
https://gomezhyuuga.github.io/dotsboxes
Technologies: HTML, JavaScript, Node.js, MongoDB, REST

Implementation of the *Dots and Boxes* game as a web application.

- Integrated both a web app and a CLI application to play the game.
- Created it as a multiplayer game.

Project: PCM Website October 2014 – November 2014
http://www.pcm1.com.mx/
Technologies: HTML5, CSS3, JavaScript, Bootstrap

Polietilenos Comerciales de Mexico (PCM) is a Mexican company dedicated to the manufacturing, printing, sale and distribution of plastic bags, rolls, films, and packages of biodegradable polyethylene of high and low density.

- Designed and implemented the official website
- Coordinated the photography sessions of the company facilities

Project: Deterministic Finite Automata October 2014
https://gomezhyuuga.github.io/dfa
Technologies: Angular v1, JavaScript, HTML

Deterministic Finite Automata (DFA) application to test validity of inputs against an *alphabet* and a *transition function*.

Project: SiRASS January 2012 – June 2012
http://serviciosocial.uacm.edu.mx/
Technologies: Ruby on Rails, MySQL, Bootstrap, JavaScript, jQuery

Information System developed and deployed for a Mexican University called Universidad Autónoma de la Ciudad de México (UACM). The system helped the university to reduce considerably times of administration processes such as student time tracking for their social service reports and also communicate effectively with their audience.

- The system reduced considerably the times of both administrative processes, and student reporting tasks.
- As Project Manager I led the requirements acquisition, client meetings and product prototype presentations, which turned out into a successfully product delivery
- Coordinated the design and development team to integrate the requirements and finish the system on time
- Developed several modules of the system: authentication, student tracking and student program registration

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Project: Hycons July 2011
https://gomezhyuuga.github.io/hycons
Technologies: Sketch, Photoshop, Inkscape

Multi-platform icon set. Originally developed for the KDE Desktop Environment but I ported it to macOS and Windows. This iconset reached the top #1 iconset at KDE-Look.org.
I personally designed each icon, walking through many iterations. Initially, every icon was crafted using Inkscape but then I migrated them to Illustrator and Photoshop.

Technology Stack

HTML5	5 years
CSS3	5 years
JavaScript	4 years
React.js	4 years
jQuery	4 years
Typescript	2 years
Ruby	2 years
Rails	2 years
Python	2 years
Node.js	2 years
Docker	2 years
Sketch	2 years
AWS	2 years
GCE	2 years
Keras	1 year