

# Francisco Gutierrez

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## BRIEF

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Software Engineer with 15+ years of experience. Proficient in Haskell and Python, interested in Julia, but comfortable with most popular languages. Currently excited about LLMs and generative AI. Best at the intersection between math and software. Looking to work remotely on mathematical applications such as AI, NLP, Machine Learning, Data Science, Quantitative Finance, Bioinformatics, Statistics, etc.

## EXPERIENCE

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### Tontine Trust

Miami Beach, FL

*Haskell Software Engineer / Quantitative Analyst*

Nov 2023 – Present

- Developed financial actuarial models for a tontine, a new retirement product.
- Developed quantitative finance forecasts and simulations in Haskell for robo-actuary software.
- Skills: Haskell, Functional Programming, Quantitative Finance, Forecasting, Simulations, Statistics, Nix, Julia, Python, Spreadsheets.

### Independent Study

Miami Beach, FL

*AI Research Engineer*

Feb 2023 – Nov 2023

- Generative AI with LLMs, chatGPT, GPT-4, the OpenAI API, and the DeepLearning.AI classes.
- Natural Language Processing Coursera specialization.
- Skills: Generative AI, LLMs, NLP, RAG, OpenAI, Vector Databases, Python, Julia, Haskell, Javascript.

### NFTYEA

Miami Beach, FL

*CTO / Co-founder*

Jan 2022 – Jan 2023

- Main developer and technical co-founder for web3 artificial intelligence startup to aggregate, categorize, and summarize information from public sources for NFT/crypto investors using GPT-3.
- Managed team of front end Javascript developers. Took application from idea to production.
- Skills: Haskell, Functional Programming, IHP, LLMs, OpenAI, Web3, Nix, Javascript, Typescript, Julia, Python, Software Architecture, Leadership, Engineering Management, Entrepreneurship.

### Capital One

San Francisco, CA

*Master AI Software Engineer*

Apr 2018 – Jun 2021

- Functional programming in Haskell. Wrote simulations/agent based models to generate synthetic data that matches real distributions. Evangelized Haskell internally, mentored other developers on the use of Haskell and functional programming techniques.
- Machine learning. Developed models for synthetic data product, mentored coworkers, led internal machine learning reading group, led team in reinforcement learning competition.
- Internal entrepreneurship. Part of team that took synthetic data product from idea to production.
- Five patent applications around agent based models and synthetic data, main author in two of them.
- Skills: Haskell, Functional Programming, Python, Simulations, Agent Based Models, Probabilistic Graphical Models, Synthetic Data, Machine Learning, Reinforcement Learning, Mentoring, Leadership.

### Independent Study

San Francisco, CA

*Deep Learning Engineer, Haskell Functional Programmer*

2017 – 2018

- Deep Learning with Andrew Ng's classes, Coursera certification, and book by Goodfellow et al.
- Deep Reinforcement Learning with class by Sergey Levine, and book by Sutton and Barto.
- Haskell with book by Allen and Moronuki.

- Skills: Haskell, Deep Learning, Reinforcement Learning, Linear Algebra, Statistics, Python.

**CollabRx**

San Francisco, CA

*Software Architect*

2016 – 2017

- Designed and developed precision medicine knowledge graph database to recommend cancer treatments based on cancer cells genotype.
- Skills: Elixir, Phoenix, Neo4j, Python, Ruby, Graph Databases, Knowledge Engineering, Biology.

**Gumroad**

San Francisco, CA

*Machine Learning Engineer*

2015 – 2016

- Main developer and maintainer of machine learning application for risk scoring and fraud detection.
- Skills: Machine Learning, Fraud Detection, Python, Ruby, Scikit-learn, Numpy, Pandas, Flask.

**Liquid Labs (Now Gigster)**

San Francisco, CA

*CTO / Co-founder*

2013 – 2014

- Main developer for all ideas in fast idea to prototype cycle. Projects included contact management tool, webRTC video chat application, experts exchange, and online stock market game.

**Tapjoy**

San Francisco, CA

*Senior Software Engineer / Data Scientist*

2012 – 2013

- Developed collaborative filtering model to recommend mobile apps, and an A/B testing framework using Octave, R, and Ruby.

**Kabam**

San Francisco, CA

*Lead Backend Engineer*

2011 - 2012

- Developed production code for fast growing online game, Dragons of Atlantis, using Ruby on Rails.

**Biemedia**

Denver, CO

*Senior Software Engineer*

2009 - 2010

- Developed web and command line applications for order management, data scraping and aggregation, process management, automated link clicking, search, and automated video generation in Ruby.

**Mercurio Marketing LLC**

Denver, CO

*Owner / President / CEO*

2008 - 2010

- Software development and consulting services.
- Management of modeling agency, production of rock in Spanish concerts, and nightclub events.

**Inspekt Security**

Denver, CO

*Principal Scientist*

2007 - 2008

- Developed statistical pattern recognition software to detect hacking attempts in computer systems from abnormal activity patterns using Ruby and R.

**Collective Intellect**

Denver, CO

*Director Of Research / Cofounder*

2005 - 2006

- Developed NLP machine learning software to extract sentiment, detect topics, and identify influencers in online message boards using Ruby, Python, and R.

**Dante Group / WebMethods**

Denver, CO

*Senior Software Engineer*

2002 - 2005

- Developed statistical anomaly detection, failure prediction, and real time OLAP software for analysis engine of business activity monitoring and business intelligence product in Java and Python.

**Quark**

Denver, CO

*Product Manager*

1999 - 2000

- Developed ad and content personalization technology for publishers leading a team of three people. Authored a patent application on the personalization technology.

**MicroStrategy**

Falls Church, VA

*Associate*

1997 - 1999

- Associate program for recent college graduates included a 6 week bootcamp where we studied SQL, Data Warehousing and Decision Support Systems in depth, and then we had a rotation through different areas of the company. I worked in marketing, product management, and web development.

**First Quadrant**

Pasadena, CA

*Equity Research Assistant*

Summer 1995, 1996 - 1997

- Analyzed historical market data to create computational financial models.
- Wrote genetic algorithms in C++ during summer research internship.

**Japan Development Bank**

Tokyo, Japan

*Summer Intern*

Summer 1996

- Wrote and presented report on Internet commerce, business opportunities created by the Internet, uses of the Internet in traditional businesses, and impact of the Internet on the global economy.
- Experienced Japanese culture, customs, language, and business practices.

**EDUCATION**

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**California Institute Of Technology**

Pasadena, California

*B.S. Double Major: (1) Engineering & Applied Science, (2) Economics*

1992 - 1996

- Double major with emphasis in physics, applied math, computer science, and quantitative finance.
- Coursework included classical, statistical, and quantum mechanics, electromagnetism, relativity, thermodynamics, physics research, chemistry, biology, computer science, circuit design, linear systems analysis, signal processing, vector and multivariate calculus, probability, statistics, linear and abstract algebra, differential equations, real and complex analysis, microeconomics, macroeconomics, econometrics, political science, cooperative and non-cooperative game theory, corporate finance, accounting, option pricing theory, stochastic calculus, investment analysis, and laboratory work in electrical, mechanical, computer, and software engineering.
- Research work included developing molecular dynamics simulations in C for the physics department, and genetic algorithms in C++ for internship through the economics department.

**ITESM**

Monterrey, Mexico

*M.S. Computer Science, Intelligent Systems*

2000 - 2002

- Computer science program focusing on practical applications of artificial intelligence, machine learning, robotics, and automation in general.
- Coursework included Bayesian networks, neural networks, genetic algorithms, simulated annealing, reinforcement learning, search and heuristics, logical inference systems, fuzzy logic, autonomous agents, decision trees, multi-agent systems, robotics, knowledge engineering, expert systems, rule-based systems, learning classifier systems, data mining, algorithm analysis, and statistics.
- Published paper: "Biometrics and Data Mining: Comparison of Data Mining-Based Keystroke Dynamics Methods for Identity Verification", Springer-Verlag Heidelberg, ISSN: 0302-9743, Volume 2313 / 2002, Book Title: MICAI 2002: Advances in Artificial Intelligence : Second Mexican International Conference on Artificial Intelligence Merida, Yucatan, Mexico, April 22-26, 2002. Proceedings

**University Of Colorado Denver**

Denver, CO

*M.S. Applied Math Classes*

2004 - 2010

- Coursework included Bayesian statistics, graph theory, linear algebra, stochastic processes, information theory, computational biology, bioinformatics, and biology.

**Coursera, DeepLearning.AI**

San Francisco, CA

*Deep Learning Specialization, Issued Apr 2018*

2017 - 2018

- Neural Networks and Deep Learning. Issued Sep 2017
- Improving Deep Neural Nets: Hyperparameter tuning, Regularization and Optimization, Sep 2017
- Structuring Machine Learning Projects. Issued Oct 2017
- Convolutional Neural Networks. Issued Feb 2018
- Sequence Models. Issued Apr 2018

**Coursera, DeepLearning.AI**

Miami Beach, FL

*Natural Language Processing Specialization, In Progress*

2023 – Present

- Generative AI with Large Language Models. In progress
- Natural Language Processing with Classification and Vector Spaces. Issued Apr 2023
- Natural Language Processing with Probabilistic Models. Issued Jul 2023
- Natural Language Processing with Sequence Models. In Progress
- Natural Language Processing With Attention Models. In progress