

Stephen Sequenzia

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A Machine Learning Engineer, Data Scientist, Data Engineer, and Python Developer who advances data, analytics, and statistical maturity within an organization with a portfolio of innovative and unique frameworks. Possesses an ideal foundation for data science: an understanding of the business perspective, statistics for analytical thinking, knowledge of the data lifecycle, and development experience to turn ideas into tangible solutions.

EXPERIENCE

Applied Theta

Machine Learning Engineer | Python Developer | Data Scientist | Owner

Orlando, Florida

Feb 2016 - Present

Create analytic opportunities with a portfolio of frameworks and models designed to accelerate development and ensure the integrity of applied Artificial Intelligence/Machine Learning models meeting domain-specific needs of financial markets. Although initially developed for internal use, many of the models and frameworks are now open source.

- Developed the entire technology strategy, roadmap, and solutions using agile software development.
- Developed several python-based frameworks and libraries.
- Utilized Machine Learning algorithms to produce financial models and algorithmic trading systems.
- Built advanced data pipelines to handle data from various market sources and time resolutions.
- Standardized codebases to utilize leading data science frameworks like TensorFlow, Keras, NumPy, and Pandas.
- Provided Machine Learning based consulting, design and development to other companies.

Photon ML Framework [Project: Internal]

A Machine Learning framework that extends the functionality of other frameworks such as TensorFlow and Keras. Photon ML is built to apply neural network and ensemble modeling techniques for deep learning financial algorithms. The framework supports the entire lifecycle of a Machine Learning project including data preparation, model development, training, monitoring, evaluation, and deployment.

Project Repo: github.com/sequenzia/photon

Technologies & Methods: Python, Neural Networks, Deep Learning, Distributed Training

Frameworks & Libraries: TensorFlow, Keras, NumPy, Pandas, Apache Arrow, Apache Parquet, Scikit-learn

Key Features of Photon ML:

- Streamlines the development and implementation of end-to-end Machine Learning systems.
- Custom object-oriented API with built-in subclassing of Keras and TensorFlow APIs.
- Built-in custom modules such as models, layers, optimizers, and loss functions.
- Highly customizable interface to extend built-in modules for specific algorithms/networks.
- Detailed logging and analysis of model parameters to increase interpretability and optimization.
- Works natively with TensorFlow distributed strategies.
- Real-time data preprocessing; dataset splitting, normalization, scaling, aggregation, and time series resampling.
- Custom batching, padding, and masking of data.
- Designed to be model/algorithm agnostic and to work natively with container services.
- Natively shares input and output between multiple networks to streamline deep ensemble learning.
- Simple interface for saving, serializing, and loading entire networks including learned and hyperparameters.
- Custom dynamic learning rate scheduling.

Modeling/Algorithm Research & Development [Project: Internal]

An evolving collection of data models and algorithms used to model financial markets including equities, options, futures, and crypto assets. The project has grown from only traditional statistical modeling to Machine Learning based modeling which includes deep neural networks and probabilistic reasoning networks.

Project Repo: github.com/sequenzia/dyson

Technologies & Methods: Deep Learning, Neural Networks, Regression, Classification, Probabilistic Reasoning, Deep Ensemble Learning, Back-Propagation, Statistical Analysis, Financial Modeling

Frameworks & Libraries: TensorFlow, Keras, Pandas, NumPy, Seaborn, Matplotlib, Statsmodels, Scikit-Learn

Algorithms & Models: CNNs, RNNs, Transformers, Attention Mechanisms, Temporal Conv Networks, Autoencoders, Bayesian Neural Networks, ARIMA, Structural Time Series

- Developed algorithms that used sequence-based modeling to make predictive inferences of assets future prices.
- Utilized advanced generalization and regularization techniques to increase the performance of models.
- Developed custom optimizers and loss functions to address the unique complexities of time series market data.
- Conducted extensive exploratory data analysis (EDA), feature engineering, data scaling/normalization, resampling, and principal component analysis (PCA).

Machine Learning Preprocessing & Pipelines [Project: Internal]

Developed a set of custom libraries to handle the unique characteristics of acquisition, preparation, and storage of financial market data. These libraries include WebSockets/RESTful API data connectors to access data, detect anomalies in hundreds of millions of data points, then cleanse and pre-process to provide high-integrity data modeling. Also included is a set of tools for domain-specific feature engineering and labeling of financial market data.

Project Repo: github.com/sequenzia/maxwell

Technologies & Methods: Data Preprocessing and Cleaning, Feature Engineering, Machine Learning Pipelines, Data Labeling, WebSockets/RESTful APIs, Nvidia CUDA GPUs, Python Data Structures, and Storage

Frameworks: Pandas, NumPy, Numba, Rapids AI, DASK, Apache Arrow, Apache Parquet, Scikit-learn, Seaborn, Matplotlib

- Utilized domain knowledge to engineer features based on technical indicators and statistical markers.
- Processed over 20 years of both trading and book market data with multiple time resolutions.
- Increased data storage and retrieval speed and efficiency, utilizing Apache Arrow for in-memory columnar storage and Apache Parquet for persistent on-disk storage.
- Produced a wealth of useful tools for managing the flow of data for various modeling and algorithmic trading, orchestrating Machine Learning pipelines, providing a high level of fluidity to feature extraction, and helping to increase the integrity of the data.
- Designed custom procedures to label time series data with algorithmic trading attributes such as stop losses, long/short price targets, ATR, and VWAP values.
- Processed and stored data from high-volume real-time market data APIs.
- Automated data labeling, binning, one-hot encoding, scaling, and normalization of time series market data.

Algorithmic Trading System [Project: Internal]

Developed a set of tools and libraries designed to interface with market brokers and execute algorithmic trading. The algorithmic trading systems execute both buy and sell orders in equities, options, futures, and crypto markets. The tools also support backtesting of trading algorithms, applying predictive models to historical data to evaluate their accuracy.

Technologies & Methods: Python, C++, Algorithmic Trading, Financial Models

Frameworks: NumPy, SciPy, Pandas, Numba, Seaborn, Matplotlib, Statsmodels

- Developed utilizing object-oriented programming in Python and C++ for increased performance.
- Designed a set of libraries that work with both rules-based and Machine Learning based models and algorithms.
- These same libraries can be used for both live executions of algorithmic trading systems and backtesting.
- Produced a highly functional and efficient algorithmic trading and backtesting system; able to trade various assets in various markets and provide increased exposure to key trading metrics.

Machine Learning Consulting & Development [Project: Data Analytics Company]

Worked with the company owner, a data professional, to make the shift from only traditional statistical analysis to Machine Learning based modeling. This shift delivered significant improvements in the quality of inferences and the accuracy of predicting the outcome of future sporting events—the core of the company's business model. Saw significant accuracy increases by utilizing attention-based transformers to make predictive inferences.

Technologies & Methods: Deep Learning, Neural Networks, TensorFlow, Predictive Modeling, Transformers, Autoencoders, Statistical Analysis

- Developed a custom pipeline to extract Machine Learning focused features from a dataset with many manual attributes built into the data.

- Designed and developed a TensorFlow/Keras based variational autoencoder neural network to reduce the dimensionality of the data.
- Designed and developed custom TensorFlow/Keras based models, algorithms, and an attention-based transformer network to make inferences/predictions in a highly stochastic environment.

Zia Technology Group Inc

Data Engineer | Python Developer | IT Consultant | Owner

**Orlando, Florida
Mar 2010 - Aug 2020**

Collaborated with senior and executive leadership on defining and implementing technology strategies and roadmaps to resolve a variety of data and information management challenges. Worked as a consultant, architect, and lead developer on solution design and development, utilizing various technologies and agile software development.

- Designed and developed complex data integrations across multiple business applications.
- Deployed many SQL/No SQL databases and designed custom data schemas.
- Designed and deployed data pipeline architectures across multiple data sources and developed ETL processes.
- Full-stack development of several custom web-based applications and reporting systems.
- Designed and implemented highly available virtual infrastructures, fully cloud-based and hybrid co-lo/cloud.

Data Warehousing & Integrations [Project: National Court Reporting Firm]

Worked with the CFO and department heads of a national court reporting firm to resolve severe operational data integration challenges. Operational data silos created issues with the workflow between systems, data quality, information visibility, and ultimately business process efficiencies. As the architect and lead developer, built technology solutions to break down silos and enable systems and data integrations. With intense business process focus, simultaneously helped to streamline and automate many accounting functions, processes, and procedures.

Technologies & Methods: MS SQL Server, ETL, Data Warehousing, Batch Processing, MS Integration Services

- Budget management, training, and supervisory responsibilities (employees and consultants).
- Designed and implemented a system to batch process large data sets and store them in a cloud-based data warehouse.
- Reverse engineered the database structure of a closed system and developed internal schemes and documentation.
- Delivered a product that provided real-time data integrations across business applications and the backend storage systems (MSSQL Server, Salesforce API, and QuickBooks Enterprise).

Data Modeling, Analytics & Reporting [Project: National Court Reporting Firm]

Worked with the CFO and department heads of a national court reporting firm to meet critical needs for information during a period of rapid growth. As an architect and developer, created models to predict future revenue, a dashboard to expose and track key performance metrics, and a reporting system to deliver consolidated financial reporting and provide information to external financing stakeholders. Delivered a robust analytics dashboard for executives and a custom reporting system for accounting.

Technologies & Methods: Model Development, Data Analytics, Reporting, Data Visualization

- Developed models to predict future revenues during high growth in many new geographic areas. Utilized multiple linear regression and other predictive modeling strategies to accurately forecast future revenues.
- Took on an expanded role, diving deep into the business side of the project.
- Blended business knowledge and revenue models with a very strong understanding of multi-dimensional data analysis to develop models and an analytical dashboard to support corporate acquisition strategies.

Web Portal & SQL Databases [Project: National Court Reporting Firm]

Developed a custom web app that was used as a hub for connecting four backend systems across multiple lines of business.

Technologies & Methods: SQL Databases, Search Algorithms, PHP, Node.js, XML, WebSockets

- Designed and developed the entire technology stack including SQL databases, and PHP/JavaScript interfaces.
- Integrated real-time data from external databases utilizing Node.js and WebSockets.
- Integrated data from QuickBooks Enterprise utilizing a custom-developed XML/PHP framework.
- Designed several search algorithms, including binary search and fuzzy match search.

Auto Leads Database & Web App [Project: Data Marketing Company]

Designed and developed a custom MS SQL database and a web-based app for providing customers leads to car dealerships.

Technologies & Methods: SQL Databases, ETL/DTS Packages, Data Architecture, Search Algorithms

- Implemented MS SQL database and designed data scheme that was used to house over 300 million leads.
- Designed ETL packages that pulled data from multiple sources into a single SQL database.
- Utilized advanced SQL Indexing to increase the speed of the retrieval queries.
- Designed several search algorithms that provided users with more granular access to the data they required.
- Developed a PHP-based front-end for the end users to use to access the leads database.

Thinksys Incorporated

Developer | DBA | IT Consultant | Owner

Orlando, Florida

Jan 2007 - Mar 2010

Worked directly with senior leadership—company owners and CFOs—to understand the business needs and deliver the right technology solutions and robust IT data infrastructures. Acted as a consultant, DBA, and lead developer on several robust business critical projects.

- Set up, deployed, and managed many MS SQL Servers and databases for both custom and 3rd party applications.
- Designed and developed complex data integrations across multiple business applications.
- Developed and deployed web-based interfaces for access to back-end data sources.
- Managed a small team of network engineers and developers.

EHR Implementations & Data Migrations/Integrations [Projects: Private Practices]

Worked with several private healthcare organizations. Provided IT Consulting, implemented EHR systems, performed data migrations/integrations, and spearheaded migrations to cloud systems.

Technologies & Methods: EHR Software Packages, SQL Databases, ETL/DTS Packages, Amazon Web Services (AWS)

- Implemented EHR systems and performed SQL-based data migrations and integrations of healthcare-related data.
- Designed, procured, and implemented enterprise servers across data centers and Amazon Web Services.
- Migrated various parts of the technology infrastructures for practices to Amazon Web Services.
- Developed new workflow procedures and transition processes to electronic workflow procedures.

Biziteks Incorporated

Network Engineer | Developer | DBA | Owner

Orlando, Florida

Dec 2001 - Jan 2007

Provided full-stack IT consulting, support, and development for small to medium-sized companies various in industries.

- Managed a team of 15 technicians and network engineers.
- Set up, deployed, and managed many MS SQL Servers and databases for both custom and 3rd party applications.
- Set up, managed, and supported hundreds of client networks and applications.
- Developed web-based applications and dynamic websites.

Financial Integrations & Reporting [Project: Public Healthcare Holding Company]

Worked directly with the CFO and comptroller of a publicly traded healthcare holding company that was in the middle of a major acquisition phase. Deployed Microsoft Dynamics GP and developed consolidated financials across all subsidiaries.

Technologies & Methods: MS SQL Server, ETL/DTS Packages, Dynamics GP, Consolidated Financials

- Set up SQL databases and MS Dynamics software for corporate and over 30 subsidiaries.
- Wrote custom DTS packages to perform ETL tasks to streamline the data flow between subsidiaries and corporate.
- Designed consolidated financial reports that were the basis for various financial regulations reporting.
- Trained and provided support for 15 accounting professionals and upper management.

CERTIFICATIONS

Google: TensorFlow Certified Developer

September 2022

Details: <https://sequenzia.com/certs>