

# Townsend Saunders III

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## Summary

**ML Engineer** with **5 years** of experience in **Machine Learning**, **AI**, **LLMs**, **Cloud Computing**, **Full Stack Software Development**, and **Data Visualization** within **e-commerce**, **finance**, and **manufacturing** industries. Specialized in **Software Engineering**, most notably demonstrated by the creation of a **unified Cloud** inventory management system that optimized product handling for 95% of products (over 6 million items) across 50+ subsidiaries at Reliance Inc. Proficient in **Python**, **SQL**, **Statistical Analysis**, **IoT Analytics**, and **end-to-end ML pipelines**, with a strong focus on **Optimization** and bridging the gap between technical teams and non-technical stakeholders. Experienced in **leading teams** through **lean product development (0-1)** in both **software** and **hardware** domains, connecting the dots across the entire product lifecycle, including **design**, **prototyping**, **testing**, **launch**, **marketing**, and **production**.

University of California, Berkeley | College of Engineering

Aug 2015 – Aug 2019

*Bachelor of Science, Engineering Mathematics and Statistics, Software Engineering Focus*

- 1 of 4 graduates.
- Berkeley Undergraduate Scholarship Recipient
- Tim Vorenkamp Award Recipient

USA Department of Treasury | Bureau of the Treasury

Dec 2024 - Present

*ML Engineering Research*

Dec 2024 – Present

*Taxpayer AI Assistant*

- **Led the maiden effort** to develop an **AI Agent** to help taxpayers navigate the cumbersome US tax system. Utilized **Llama 3.1** as the base **LLM**, **RAG** for document embeddings, and the entire IRS Manual as data.
- Migrated legacy **sklearn random forests fraud detection** and taxpayer **regression and classification pipelines** from on-prem to the cloud via **Databricks**.

Tree Ring Design | Online E-Commerce Fitness Startup

Sep 2023 – Present

*Lead ML Engineer*

Sep 2023 – Present

*Olympic Gymnastics Rings*

- Built Tree Ring Design's **online retail web app** with 2024 Olympic team member, Dominique Parrish, and led the launch of her signature product.
- Made use of **Dall-E 3** for product images and assets, allowing for **agile smoke tests** and **market research** without the need for a physical product. **Directed AI-driven marketing strategies**, leveraging **Dall-E 3** and **Google Ads** to achieve a **261% increase in impressions** and a **57% boost in CTR** within 1 month, demonstrating the potential of AI in product promotion.
- **Developed interactive dashboards** using **Python** and **deployed them to the Cloud with Streamlit**, providing **real-time insights** into manufacturing cost vs. profit scenarios, **aiding in data-driven decision-making**, and leading to the **reduction of manufacturing cost by 67%**.
- Designed a set of "Blue Ocean" product features **minimizing competition** and maximizing untapped market space.
- **Negotiated a 30% contract discount** with a 3rd party Engineering and Product Design firm saving precious capital while ensuring the development of a safe and manufacturable design.

Reliance Inc. | Manufacturing giant involved in global metals distribution

Feb 2020 – Sep 2023

*Senior ML Engineer*

Feb 2022 – Sep 2023

*Inventory Mastering Lead Engineer*

- **Built a unified Item Master solution**, streamlining inventory management across 50+ subsidiaries and 6 million products, **allowing for inventory sharing**, **improved efficiency**, and **reduced customer churn**.
- Collaborated with stakeholders to deliver a standard inventory labeling system using **Agile workflows**, **Python**, **Spark (PySpark)**, **AWS tools**, and various statistical modeling and **Machine Learning techniques**.
- Applied **NLP techniques** such as **tokenization**, **stop word removal**, and **term frequency-inverse document frequency (tf-idf)** to convert industry/company-specific language into concise product descriptions. Employed tools such as **NLTK**, **spaCy**,

Gensim, Hugging Face Transformers libraries (BERT), and Scikit-learn for stemming, lemmatization, text preprocessing and feature generation.

- Automated **real-time model optimization, deployment, and algorithm evaluation** via **AWS Sagemaker** and held the leadership role on a team consisting of internal Data Scientists, Data Engineers, and external Deloitte analysts.
- Wrote rigorous documentation and testing via **Python scripts, Jupyter Notebooks, and GitHub** for long term code maintenance, explainability, and debugging.

## ML Engineer

Feb 2021 – Feb 2022

### *Anomaly Detection and Predictive Maintenance*

- Spearheaded an **anomaly detection** system for warehouse machinery, preventing costly breakdowns and hazards.
- Interfaced with supervisors, creating **real-time alert systems** based on **critical telemetry data** from 30+ Bosch XDK's.
- **Mentored our Junior Data Scientist** on the ins and outs of Machine Learning projects and provided guidance on how to effectively communicate timelines and deliver results.
- Employed **AWS** for data streaming, analysis, and **TensorFlow** for **Deep Learning (Long Short Term Memory Networks)** as well as **Principal Component Analysis (PCA)** and **Latent Factor Analysis** for preprocessing enabling diagnostic, predictive, and prescriptive insights, including machine shutoffs and preventative maintenance.
- Preempted multiple breakdowns, expanding its application across various warehouses.

### *Serverless Forecasting Web Application*

- **Enabled large-scale forecasting for 50 companies' entire product lines.**
- Designed a serverless Data Lab web app using **AWS tools, Docker, GitHub, Sagemaker, and Python** allowing for an interactive forecasting experience for non-technical stakeholders.
- Developed a UI for non-tech users to query our **Data Warehouse** via **Snowflake's Snowpark** and try a multitude of statistical forecasting methods (**Decision Trees, Neural Networks, Random Forests, Linear and Logistic Regression, ARIMA, etc.**) without the end user having to write a single line of code.
- Established an **ML pipeline** for time-series data, with visualizations using **Streamlit, Plotly, Lambda, matplotlib, seaborn, Altair, and Pandas.**
- **Created a Data Lake in Amazon S3** featuring **millions of data points scraped** from sources across the internet.

## Data Scientist

Feb 2020 – Feb 2021

### *Automating Customer Support*

- Automated manual dashboard reloads that were performed hourly from 6:00 AM to 3:00 PM 365 days a year by a team of 8 BI developers: monitoring loads of 60+ dashboards with **end users in China, India, Europe, and the US.**
- **Saved tens of thousands of dollars in wasted man-hours per year.**

### *Cleaning Supplier Data*

- Implemented a **probabilistic matching process** that matched unknown Reliance Suppliers to their corresponding DUNS numbers, **accounting for millions of dollars** of previously unknown purchasing figures.

## Skills

### Programming Languages

- Python
- Java
- SQL
- C
- JavaScript
- Ruby
- HTML, CSS
- MATLAB
- R

### Tech Stack

- AWS
- Azure
- Databricks
- Jupyter
- Streamlit
- GitHub
- Docker
- Snowflake
- Tableau

### Machine Learning

- PyTorch
- TensorFlow
- Scikit-Learn
- Pandas
- PySpark, Snowpark
- SageMaker
- Hugging Face
- Llama 3.1
- ChatGPT, GPT-4, GPT-4o

## Demographics

### Citizenship

US Born Citizen

### Primary Language

English Native

### Secondary Language

Spanish Conversational

### Gender

Male

### Race

Multiracial