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Role: Data Science Engineer

Tools

- Language AI (LLM): LangChain, LangSmith, GroundTruth & SageMaker
- Observability: OpenTracing, Lightstep, Splunk, Tableau, Grafana
- Data Science: Pandas, PyTorch, PySpark, Geospatial, sklearn
- Engineering Stack: Python, Linux, Flask/Django REST API, SQLAlchemy, Angular, AWS, Docker, Kubectl, Rancher

Notable successes

- new CPAL LLM Chain - first causal LLM chain. Tweet by LangChain
- new algorithm to reduce LLM inference load by 80% and 10x ground truth
- new observability system for two companies
- new language AI feature for one company
- new microservice paradigm for one company
- new geospatial human inequality metrics (PhD research)

Style

- tackle cross-silo, ambiguous, high impact problems
- tackle process friction with innovation
- dive into the semantic nuances of the data

Job experience

AI Engineer at Intuitive Systems, 2023

Intuitive System's is an early stage start-up building language AI applications for vendor management and customer complaint triage.

- canonicalization algorithm and data curation
- prediction evaluation
- inference server system design
- high-level advice to founder

AI Technical Product Manager, consultant at SimpleLegal, 2022-2023

SimpleLegal is a legal billing analytics company.

Before I arrived, my employer's new language AI feature for flagging suspicious invoice lines was stuck for one year because of bad performance, even after investing in more human annotation. My job was to increase AI performance. The result was we launched the AI feature and won an AI Excellence Award.

I changed the direction from data quantity to data quality.

- I asked the President to convene an Amazon 6-pager meeting to share the results of the gathering mission, outlined below.
- I built relationships with five experts across the conglomerate.
- The annotation expert opened my eyes to treat the offshore annotators as creative partners. Success depended on getting their feedback for the continuous improvement of the annotation guidelines and AI flag definitions.
- I nudged the data scientists to articulate the biggest issue as *"garbage in, garbage out"*.
- I connected with a Founder (VP of Product) at a sister company who translated for me the customer meaning behind the legal invoice line-item data.

I managed the offshore annotators.

- I included the offshore annotators and subject-matter expert into a continuous improvement collaboration on AI flag definition and annotation guidelines.
- I changed the annotation process to small batches
- I started inter-annotator performance metrics and reviews.
- To build cognitive empathy, I labeled several hundred sentences. As a result, I identified convoluted annotation guidelines as the root cause of our poor labeling quality.

I led the Senior Data Scientist and the subject-matter expert.

- I added the subject-matter expert to our team.
- The technical vision I set for the data scientist and I was to launch an MVP in six months by discovering "low-hanging fruit" that could scale back the machine learning effort. This resulted in scaling back our machine learning from eleven to three redefined classifiers. The triage was to kill one classifier that was never needed, replace two with expert rules, and stop the labeling on five whose performance was sufficient.
- To increase clarity, I coached the team to understand the customer meaning behind the data and the AI flags.
- To increase clarity, I crunched the knowledge of the Data Scientist's metrics analysis into a working paper, which was continually shared at the weekly check-ins.
- I wrote the data scientist a stellar performance review, highlighting his acumen at articulating complex concepts to executives.

I led the engineering tasks.

- I assigned Jira issues to engineers.
- 1:1 meetings with the VP of Engineering.
- After one engineer left for another company, I stepped in to refactor the inference server.

Lead Analytic Endpoint Engineer at Sight Machine, 2018-2021

Sight Machine is a manufacturing analytics company.

- To get the company's biggest public-facing feature, Recipes, across the GA line, I worked across silos (Customer Success, DevOps, Data Engineers). I wrote high-level design papers to help the Product and Customer Success teams understand the time cost of competing technical design decisions, arming them with a conceptual framework to gather more information from the customer on her priorities.
- I started a new checklist process to lock down successful sales demos.
- I nudged the engineering team to move from a delivery team to a product team. The Director of Engineering and I started a new process where the engineers fleshed out their own Jira issues. The new technical design autonomy reduced engineering toil and increased creativity.
- I built the first distributed tracing (Lightstep), which made debugging system downtime easier.
- I proposed and delivered a new standardized frontend development environment. The innovation made debugging and on-boarding easier.
- I coached junior engineers in systems thinking.

Lead Data Engineer at HiQ Labs, 2015-2018

HiQ Labs was a people analytics company.

- I led the move from a monolith to a microservice paradigm. I led a Data Engineer to guide the Data Scientists to refactor each component of their monolith into a docker container service. I explained to management the technical and human vision behind the microservice paradigm.
- I owned the scraping part of the pipeline. The puzzle for the CTO and I was to figure out how to get around LinkedIn's bot detection in order to scrape millions of HTML public profiles, the raw data for our prediction pipeline.
- I led a Junior DevOps engineer to build a Splunk observability system that was used to track performance and experiments on different spider configurations.
- I trained a Junior Data Engineer to maintain the scraping system.
- I shadowed the Data Scientists to see what I could automate for them.
- I migrated the Data Scientists from Mongo queries to PySpark.

Start-up partner and full-stack developer at Map Decisions, 2014

Map Decisions was an asset management company for city Public Works departments.

- I built a mobile app to automate street sign inspection.

Start-up partner and analytics developer at Geoscore, 2014

Geoscore was a company for demographic analytics.

- I made the analytic endpoints.
- I ran Google Ad experiments around comparing SEO strategies.

Developer at Urban Mapping, 2011-2013

Urban Mapping provided geospatial analytics to Tableau.

- I created KPIs.
- I built the CI pipeline (Jenkins).
- I built the observability system (Splunk, Tableau BI Dashboard).

Misc leadership roles

- I gave technical vision to students in Medellín, Columbia to make ClusterPy.
- I coached graduate students and taught spatial statistics, as a PhD.
- Kids snowboard instructor at Vail Resorts, CO.
- Restaurant Assistant Manager at Vail Resorts, CO.
- Lead analyst at California Business Magazine. CA.
- Counselor for emotionally disturbed children. Seneca Institute. CA.

Open source code and writing

- Langchain PR: Causal Program-aided Language (CPAL)
- Normalize tables using a LLM
- *How can language AI performance be raised with cognitive empathy?*
- A play Ethereum MEV bot
- Small commit to shell-ai
- A git bare approach to version control your dot files
- Work papers
- Geoscore (repo)
- PhD thesis. *Assessing Inequality using Geographic Income Distributions*
- *Spatial Econometrics* entry. Encyclopedia of Human Geography. 2009.
- *Interactive spatio-temporal modelling of health systems*
- *σ-convergence in the presence of spatial effects*
- *Integrating Econometric and Input-Output Models in a Multiregional Context*