

Outreach builds end-to-end NLP model with Amazon SageMaker and MLflow



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Executive Summary

Outreach, a Seattle-based startup, set out to revolutionize the sales process. Its platform allows sales representatives to create tailored, automated sequences to communicate with prospects. While sales reps have been historically evaluated on their response rate—how many emails were replied to or calls returned—Outreach wanted to go one step further. The data science group built a natural language processing (NLP) model using Amazon SageMaker and Databricks MLflow that extracts the intent of a reply from prospects. So instead of holding sales reps accountable for a response rate of 10 percent, the model can help Outreach clients determine the breakdown within that rate, because there's a big difference between a reply asking to unsubscribe and a reply looking for more information.

Small team sought a managed ML service to get up and running

Just a few years ago, Outreach was only a few individuals with a small IT team. But today, roughly 20 employees handle the company's machine learning (ML) production engineering. To build and deploy an NLP model that measured the intent of clients' emails, the team sought a fully managed solution that would support the entire lifecycle of the model—from annotating emails based on the intent of the message, to model deployment. "We didn't have the resources to build it ourselves," said Yong Liu, principal data scientist at Outreach. "We're a small team and we wanted to ship features rather than doing infrastructure work."

Handled entire ML lifecycle with SageMaker and MLflow

Using Amazon SageMaker Ground Truth for data labeling, Liu and his team first annotated a training dataset stored in Amazon Simple Storage Service (Amazon S3). Then, with MLflow running on Databricks, the team experimented with different ML models, narrowing down which version worked best and productionalizing it. Through a Databricks API, the team loaded the trained model and deployed it to a SageMaker endpoint. "We adopted Databricks because it can handle the massive data processing and analysis we needed for this high volume of emails," Liu said. "And with the capabilities of MLflow, we found a lot of productivity gains."

About Outreach



Outreach, a leading enterprise-ready sales engagement platform, accelerates revenue growth by optimizing every interaction throughout the customer lifecycle. The platform manages all customer interactions across email, voice and social, and leverages machine learning to guide reps to take the right actions.

CHALLENGE

With a small data science team, Outreach sought a managed ML solution that handled the heavy lifting of a natural language processing model.

SOLUTION

Using Amazon SageMaker and Databricks MLflow, Outreach built an end-to-end model that extracts the intent of sales emails.

RESULT

- **Built an end-to-end NLP model**



“With the capabilities of Databricks MLflow, we found a lot of productivity gains.”

Yong Liu
Principal Data Scientist,
Outreach

Built standout features that win clients

Augmenting the Outreach platform with ML intelligence has enabled the company to further differentiate its product and stand out amongst competitors. “This is a gamechanger for the entire sales industry,” Liu said. “Before they had no visibility into a sales rep’s performance, and now they have a level of insight they’ve never had before. Our clients are very excited about this feature.”

Optimized costs with SageMaker endpoint

SageMaker offers support for both GPU and CPU computing in its endpoints. This enabled Liu and his team to determine an appropriate model response time that struck a balance between costs and speed. And because the endpoint is within Outreach’s AWS account domain, the team didn’t have to worry about managing compliance on their own. Amazon S3 maintains compliance programs, such as PCI-DSS, HIPAA/HITECH, FedRAMP, EU Data Protection Directive, and FISMA.

Pinpointed decision makers for better sales

Following the momentum of their intent model, Liu and his team have their sights set on another ML project—to further classify responses by the sender’s department and seniority. While the Outreach platform can extract names and phone numbers from email signatures, this model would use ML intelligence to determine the level of decision-making power of the sender, which is key information for sales reps. “We think of it as a flywheel for our clients,” Liu said. “We’re adding more insights and actionable things into our product and they love it.”

About Partner

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