Anomaly Detection

How to Improve Core Product Accuracy and Efficiency with IoT

Predictive analytics can help improve product or service efficiency and accuracy. A good way to do so is developing anomaly detection, as it enables to identify items, events or observations which do not conform to expected patterns. Fraud detection, system health monitoring, event detection in IoT are just a few examples of what automated anomaly detection can help improve. But each and every application of anomaly detection is nevertheless oriented towards one thing: improving the core product quality.
Anomaly Detection to Improve Core Product Accuracy & Efficiency with IoT

**Challenge**

**Improve Speed Limit Reliability**

Coyote’s IoT devices and apps rely heavily on the accuracy of incoming data. Of particular interest are the driving speed limits within their embedded maps. Keeping them accurate and up-to-date is a big challenge for Coyote’s quality teams. In terms of data analysis, Coyote needed an automated algorithm-based solution that would correct speed limit data. Ideally, the solution would leverage the high volume of incoming data from their IoT devices (billions of rows with anonymized speed and position of their users) to turn them into actionable insights and predictions. By association, this also meant that Coyote needed to install a data-driven approach within the company — decisions needed to be based on real-world data rather than standards analytics reports. In order to meet these challenges, Coyote approached Dataiku. The two companies already enjoyed a long-term relationship — in 2015 Coyote deployed a churn project developed using Dataiku Data Science Studio. Given the project’s success, Coyote decided to extend their use of predictive analytics to their core product development.

**Solution**

**Machine Learning to Detect & Refine Speed Limit Data**

Armed with Dataiku DSS, Coyote used its Machine Learning capabilities to detect anomalies in their speed limit referential, within specific datasets. Coyote developed an algorithm to leverage vast amounts of IoT-derived data. It segments roads into sections and analyzes patterns in each section. This enabled Coyote to build a predictive model that estimated the speed limit of the road section. The Machine Learning process facilitated the detection of speed limit anomalies and, consequently, enabled Coyote to estimate the global quality & reliability of the displayed speed limit. The entire process wouldn’t have been possible without Dataiku DSS’ collaborative functionalities. Thanks to the platform’s focus on teamwork & cooperation, which enabled employees with differing skill-sets to work together, Data Mining & Visualization are now widespread within the company and there is a growing awareness of Smart Data issues.

**Results**

**Significant Improvement of Speed Limit Referential**

Using Dataiku Data Science Studio enabled Coyote to improve their core product’s accuracy & efficiency while establishing a data-driven spirit within the entire company. Key accomplishments include: Speed limit reliability increased by 9% on analyzed datasets; Automation of the speed limit correction process; A global data-driven spirit within the company; Increased customer loyalty.

“Speed limit reliability has been increased by 9% on analyzed datasets”

Florian Servaux
Smart Data Team Leader
Coyote

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### Coyote & Dataiku Overview

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<th>Technology</th>
<th>Time</th>
<th>Team</th>
<th>Model</th>
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<td>Vertica, Python, PostgreSQL</td>
<td>4 Months</td>
<td>3 Data Scientists 1 Data Analyst</td>
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- **Technology**: A single platform for data scientists, analysts and business users
- **Time**: Fast iteration to optimize a random forest algorithm
- **Team**: Real-time IoT data ingestion to follow traffic evolution
- **Model**: Daily automated re-training to improve accuracy

### Coyote & Dataiku: Anomaly Detection Application Results

- Easy access by Coyote product owners to the algorithm’s output
- Speed limit detection automated to increase data reliability

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