AI Observability
With Explainability

www.fiddler.ai
AI Observability with Explainability

Executive Summary

Artificial Intelligence (AI) is being increasingly applied to business-critical use cases across industries, but operationalization of ML applications presents significant challenges to achieving successful business outcomes. The unique operational issues and inherent opaqueness of Machine Learning (ML) models requires a new solution.

Fiddler provides the first AI Observability solution that offers monitoring integrated with explainability to inspect and address a comprehensive range of operational ML insights and issues, saving teams time and money.

The Need for AI Observability

AI is becoming increasingly applied at companies across industries with businesses doubling their spending in AI systems from a projected $35.8 billion in 2019 to $79.2 billion by 20221.

But, AI is not the easiest technology to deploy. AI tools have emerged to help enterprises successfully productionize AI projects. However, productionizing AI is only the first step: companies must then monitor their models to ensure risk-free and reliable business outcomes, especially with the opaqueness of ML models.

ML models are unique software entities trained for high task performance. Their performance can degrade over time due to changes in the data feeding the model after deployment. Revalidating their business value requires continuous monitoring on an ongoing basis.

Although monitoring provides real-time issue visibility, it is often insufficient to identify the root cause of issues given the AI system’s complexity. Observability, a means to deduce internal state from its external outputs, is therefore critical to know the ‘why’ for a quick resolution.

The recent news stories about alleged bias in credit-lending, hiring, and healthcare AI algorithms demonstrate what can go wrong when there is a lack of transparency and visibility into AI solutions. Explainability enables this observability by unlocking black-box AI to provide much needed visibility, insight, and trust.

Operational Challenges in AI

Today, there are two approaches to monitor production software:

- Service or infrastructure monitoring used by DevOps to get broad operational visibility and service health.
- Business metrics monitoring via telemetry used by business owners to track business health.

Neither approach provides the critical ML model level insights that a Data Scientist or ML developer needs to operationalize a deployed model.

ML models have these 5 unique operational challenges:

1) **Model decay.** Unlike other software, ML model performance can decay over time. Monitoring for correct model outcomes, when available, provides immediate business impact change notifications.

2) **Data drift.** Although ML Models are trained with specific data (e.g. age 20-60), they can encounter different data in production (e.g. age 60-80) and consequently make suboptimal predictions.

3) **Data integrity.** Business data is dynamic and its composition is constantly changing. This can have an adverse performance impact on ML Models, especially with automated data pipelines. Data inconsistencies can often go unnoticed in deployed AI systems.

4) **Outliers.** Deployed ML models can run into data that is far outside the training distribution. These outliers can cause isolated performance issues difficult to debug globally. Pinpointing them in real-time can provide insights into addressing issues right away.

5) **Bias.** Even after monitoring for data changes, its true impact on protected groups might change despite...

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1 The Wall Street Journal, April 1, 2019.

Fiddler Labs AI Observability with Explainability

Founded in October 2018, Fiddler Lab’s mission is to enable businesses of all sizes to unlock the AI black box and deliver trustworthy AI experiences for their customers. Fiddler’s next-generation Explainable AI Engine enables data science, product and business users to understand, analyze, validate, and manage their AI solutions, providing transparent and reliable experiences to their end users. Our customers include pioneering Fortune 500 companies as well as emerging tech companies. For more information please visit www.fiddler.ai or follow us on Twitter @fiddlerlabs.
model validation i.e. an ML model could become biased after deployment.

What is AI Observability?
A robust AI monitoring system requires integration with model serving infrastructure to guard against these 5 operational challenges. It allows users to easily review real-time monitored output for spotting KPI and other issues or act on alerts.

Investigating operational ML issues that are flagged often takes a lot of effort. The black-box nature of ML models makes them especially difficult to understand and debug for ML developers.

An AI Observability system extends traditional monitoring to provide deep model insights with actionable steps. With observability, users can understand the problem drivers, root cause issues, and analyze the model to prevent a repeat. This helps save considerable time.

Building a comparable homegrown solution with an open source dashboard solution can be resource prohibitive and create compliance risk.

Our Approach to AI Observability
The need to continuously validate the business value of AI, in light of its unique challenges, calls for a new AI Observability approach that is operationally simple, covers monitoring metrics exhaustively and provides exceptional model insights.

Simple. Fiddler’s out-of-the-box integrations are easily pluggable with your existing data and AI infrastructure, and works across top ML frameworks. It automatically monitors all metrics - from raw data to production models - to save time and ensure consistent high performance.

Comprehensive. Fiddler’s extensive suite of monitoring capabilities covers the 5 aforementioned operational challenges of ML models with intuitive user interfaces for both technical (model developers, ML Ops) and non-technical (analysts, business owners) stakeholders.

These capabilities collectively complement each other to uncover issues otherwise difficult to identify individually.

Actionable. Fiddler’s industry-leading explainability powers the AI Observability with insights behind the production issues. Live explanations with model analytics are essential to learn the ‘why’ and ‘how’ behind the model behavior.

Our analysis tools, including the industry-first ‘Slice and Explain’, provide extensive explanations into the issues behind changes in model operation statistics and any corresponding alerts triggered. Fiddler’s user interfaces enable these explanations to be shared across all AI stakeholders bringing transparency into AI operational issues. This support helps ML developers ensure models are back running smoothly and preempts further issues.

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