

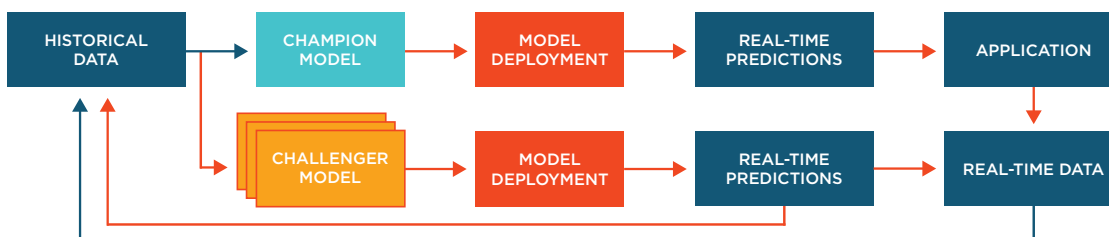
# CHAMPION/CHALLENGER TECHNIQUES IMPROVE AI PERFORMANCE

To successfully operationalize machine learning (ML) algorithms, data science teams must be able to continuously update their models so they can improve their predictive performance. The champion/challenger approach is a well-documented method for optimizing models and making adjustments that accounts for changes in the nature and quality of data inputs. Altair's ML products make it easy to incorporate champion challenger processes into data analytics workflows.

## Champion Challenger Supports Continuous Improvement

Champion/challenger techniques help data science teams test new models and update their systems as needed. Champion challenger is like A/B testing methods often used to tweak marketing and advertising campaigns, but instead of randomly distributing traffic to two or more models, data scientists implement a “challenger” model (a new model) and compare its performance to the “champion” model (the existing model) based on the same set of data. The team can compare each model's outputs and determine if the challenger is outperforming the champion and, if so, replace the champion with the new algorithm. Of course, a champion-challenger process can become complex and involve several challengers, various algorithm selection methods, and multiple success criteria, but the basic concept is simple.

To support efficient testing and the updates required for the champion/challenger framework, the ML platform must support multi-model deployments, a variety of traffic routing options, easy model replacement that doesn't cause downtime, and built-in feedback loops that capture changes in input data and model predictions over time.



The software sends the same set of model testing data to the champion and challenger models. Most users begin champion/challenger testing after their first model is up and running with feedback loops in place to store a useful number of predictions. At that point, they introduce a challenger model and test it against the champion using the latest data. If the challenger model outperforms the current champion, they then promote the challenger and remove the old champion model from the workflow. In Altair® SmartWorks™ Analytics, promoting a challenger model requires only a single click.



Implementing an efficient champion/challenger process is mission critical for any large enterprise using machine learning models. It's far beyond a 'nice-to-have' capability – it's an essential component in the successful operationalization of AI technology.”

Sam Mahalingam, CTO, Altair

Learn more about Altair's ML capabilities:  
[altair.com/machine-learning/](https://altair.com/machine-learning/)

## The Altair Solution for Champion/Challenger Implementations

The Altair platform approach also supports the complex traffic routing option required of champion/challenger methods, and automatically scales to handle any surges of traffic at the endpoint. Built-in feedback loops make it easy for data science teams to identify model degradation issues and take quick corrective action.

### Altair's comprehensive ML offerings enable clients to:

- Register any model in the model repository so they can use it in model deployments regardless of source, including popular model types such as sklearn, PySpark, TensorFlow, and existing Altair® Knowledge Studio® models
- Deploy a single champion model, add a new challenger, or seamlessly convert a champion to a challenger without interrupting the flow of predictions from the system
- Automatically scale their predictive services up based on changing requirements
- Capture live data and model outputs from both the champion and challenger models and produce reports comparing model performance
- Use the feedback loop to gather model predictions and join them with ground truth data to add new data for model training

Models built using Knowledge Studio's intuitive visual interface are fully compatible with [SmartWorks Analytics](#). With it, teams simply upload their models and the system automatically adds them to a centralized model registry. They can then use the model in a secured model endpoint with built-in autoscaling to generate predictions in a production environment.

### Enterprise-Wide Applications

Champion/challenger frameworks offer numerous benefits for enterprises in a wide range of industries. They give data science teams a thorough understanding of the real-world impact of their models, quantify costs, reduce risk, and support continuous high-quality process improvement in a governed environment.

### Use cases include:

- Anomaly detection
- Anti-money laundering (AML) regulatory compliance
- Capacity planning
- Credit and loan approvals
- Customer lifetime value (CLV) assessment and prediction
- Fraud detection
- Predictive maintenance

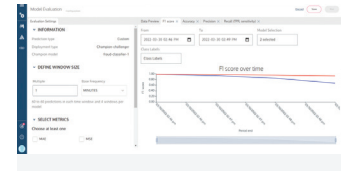
### Altair: A Comprehensive Range of Data Analytics Tools

Altair gives teams the power to use data analytics and AI to gain competitive advantages and drive next-level business results:

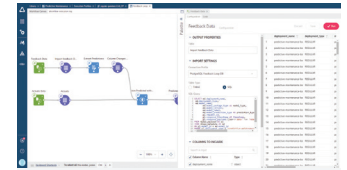
[Artificial Intelligence and Machine Learning](#): Our industry-leading visual approach to analytic modeling minimizes repetitive tasks, shares knowledge across enterprises, and reuses steps within connected model workflows for faster analysis and shared insight.

[Data Preparation](#): Access, cleanse, and format data from a wide variety of sources (including Excel, CSV, PDF, TXT, JSON, XML, HTML, SQL databases, Big Data like Hadoop, and more) without any manual data entry or coding.

[Stream Processing and Data Visualization](#): Connect directly to streamed sensor data from MQTT, Kafka, Solace, and other message queues and build complex stream processing applications with a simple drag-and-drop interface. Build and publish sophisticated real-time dashboards without writing any code.



Feedback loops are essential for capturing changes in input data and model behavior. SmartWorks Analytics provides built in feedback loops for model deployments.



Data science teams often monitor the performance metrics of champion and challenger models over time. SmartWorks Analytics provides built in reports for tracking metrics relevant to model type being assessed.