

Is Accurate Forecasting or Anomaly Detection Essential for your business?
Transforms Time Series into Reliable Insights in Just Seconds

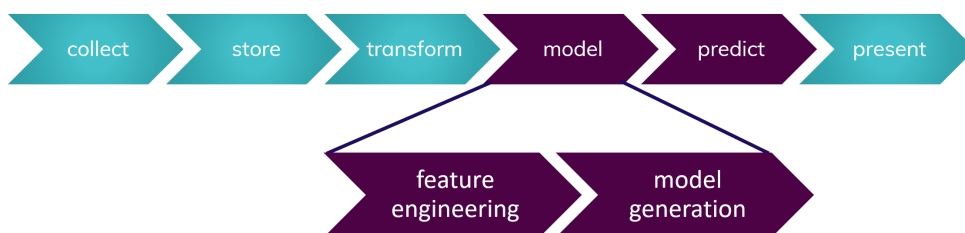
A Breakthrough Automatic Model Generation Technology

TIM™ Overview

TIM™, Tangent Information Modeler, is a predictive modeling engine that automates the forecasting and anomaly detection process by analyzing time-series data and generating accurate models based on the patterns it detects. TIM™ can be deployed as a standalone Cloud-based Web application or as a Web service that can be easily integrated with your existing business applications through a simple API interface. Your TIM™ -enabled end to end solution can be deployed entirely in the cloud, on premise, or using a hybrid approach.

To build a model all you need to do is feed your historical data into TIM™, and in just minutes it creates a predictive model ready for validation and deployment.

- Driving Digital Transformation through Artificial Intelligence (AI) and Machine Learning (ML)
- Focussing on Predictive and Prescriptive analytics
- From Hindsight to Insight and Foresight



TIM™ Design Criteria

Automated feature engineering

Other modeling tools require tedious, manual “feature engineering” that requires a domain expert to select which combinations of input data over what time delays are potential predictors and are relevant to the machine learning process. This compute-intensive trial-and-error process can take weeks, since the number of combinations grows exponentially with the number of input variables and time intervals. TIM™ is different. It automates the feature engineering process by analyzing the historical input data and determining which data is relevant to the predicted output. For example, if a machine’s vibration is sensitive to condensation, which is related to a hot, humid day following a cool day- TIM™ will spot this pattern and incorporate it into the model.

Accuracy that rivals finely tuned hand-crafted models

Seeing is believing. Many of our customers had existing models that were built and tuned manually with months of effort. Imagine their surprise when TIM™ created a model in minutes with equivalent or even better accuracy. It’s no wonder that Tangent Works was a winner at the recent [IEEE GEFCom 2017](#) competition for energy demand forecasting accuracy.

Scalable in every way

TIM™’s underlying technology is extremely compute-efficient and therefore can process huge data sets in minutes. That means you can automatically create models for hundreds or even thousands of individual assets or customers- and update those models as frequently as you’d like. TIM™ also helps your organization scale to handle the increasing demand for predictive models by automating the most tedious aspects of model-building and fully leveraging your existing resources.

Explainable AI – see and understand how your model works

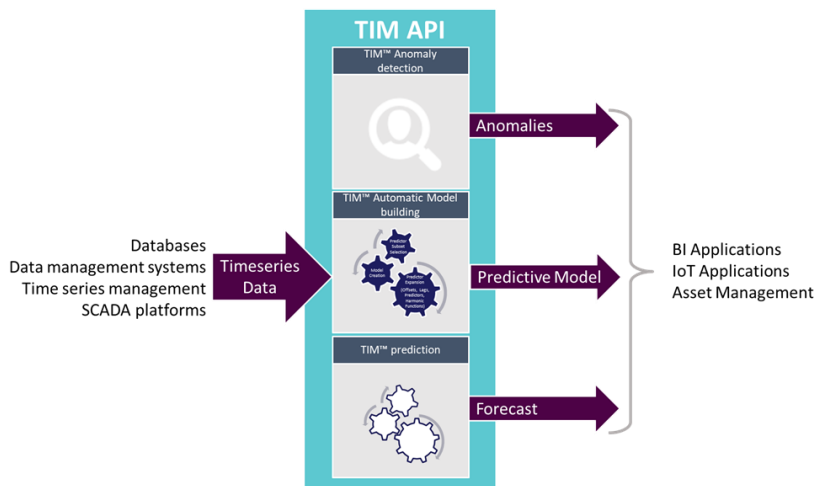
A challenge with any predictive model is how to explain it to the people who depend on it for forecasting. TIM™ creates its models in human-readable format, as both an equation and as a visual map that shows the weighting and relationships of all the input variables. For example, you’ll see that the machine vibration is directly related to the sequence of hot, humid days and cool days, but is also related to the time since the last routine maintenance.

Easily integrated with your existing applications

TIM™ was architected for rapid integration with your existing databases, BI tools and other enterprise applications since all of its functions are easily accessible through its REST API. It also gives you the utmost deployment flexibility with support for cloud-cloud, on-premise and hybrid configurations. Most integration projects take just a few days to complete.

- Allowing Data Scientist to focus where they make the difference
- Offering easy to implement and integrate solution for IT
- Business decision makers can embark on predictive/ prescriptive analytics in days and obtain real explainable AI

- Easy integration
- Remove the manual process of model selection



TIM™'s Breakthrough Technology

Any time a software product automates a tricky manual process the question comes up- how does it do that? There's a lot of buzz about AI these days, and technologies like Deep Neural Networks (DNN) or Convolutional Neural Networks (CNN) are often mentioned in the news. While these techniques are great for image classification and speech recognition applications, they don't work very well on time-series data that is the basis for energy forecasting, anomaly detection and predictive maintenance-- applications where TIM™ really shines.

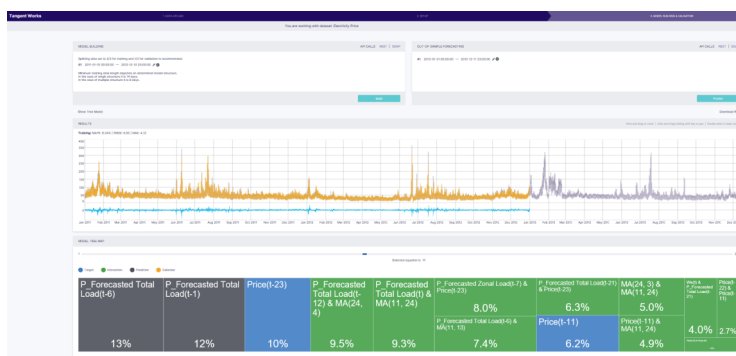
TIM™'s "secret sauce" is based on a field of mathematics known as "information geometry", which was originally developed in Russia and Japan in the 1950s-1980s, but only recently put into practice by Tangent Works. You'd have to be a research mathematician to understand the underlying concepts, but if you're curious about terms like "Riemannian manifold", "Bayesian inference" and "Tangent space", you can look it up on Wikipedia. The real proof of TIM™'s technical approach is that it just works. Hence the company name - Tangent Works.

Advanced Forecasting and Anomaly Detection

Automatic model generation for time-series data goes hand in hand with anomaly detection. As TIM™ analyses the historical data it looks at each input variable and its relationship to the target output variable. In doing so it also calculates the normal distribution for each variable. The anomaly detection module compares those historical distributions against incoming production data and can issue anomaly warnings when there is a significant discrepancy.

Easy To Use—Easy To Integrate

TIM™ comes with an easy to use API to integrate with your solutions. You can also use the TIM™ webapp that allows business users to run predictive / prescriptive analytics scenarios with full insight in the automatically generated model offering real explainable AI. TIM™ also integrates easily in tools such as Microsoft PowerBI, Tableaux, ClickView,....



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