



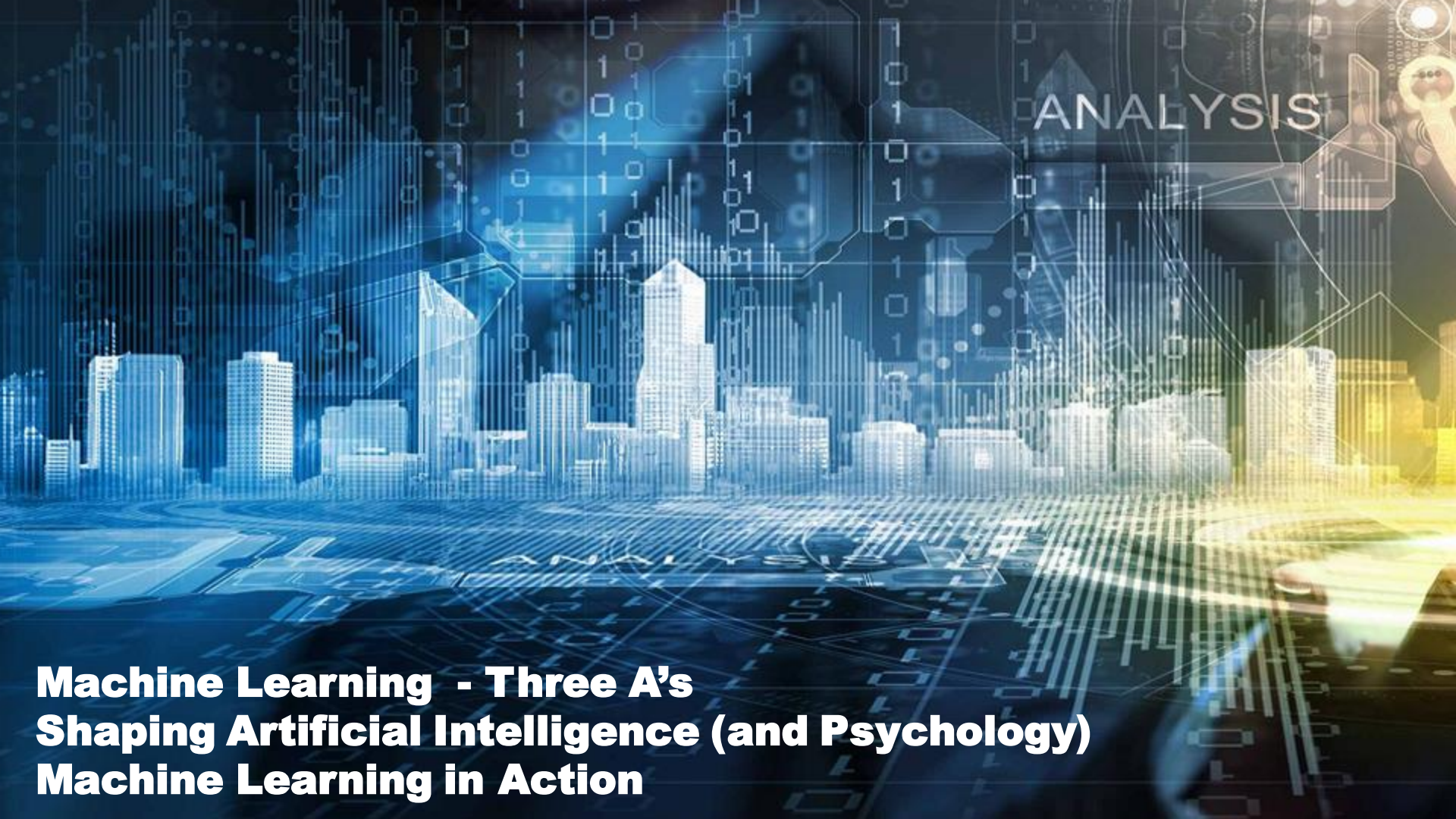
SAS® FORUM
PORTUGAL 2016

Welcome

Machine learning: Today and Tomorrow

Andrew Pease

Global Technology Practice



ANALYSIS

**Machine Learning - Three A's
Shaping Artificial Intelligence (and Psychology)
Machine Learning in Action**

What is

MACHINE LEARNING?



Machine Learning in the Analytic Landscape

"A field of study that gives computers the ability to learn without being explicitly programmed."

-- Arthur Samuel, 1959



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Supervised Learning

Linear Regression

Logistic Regression

Generalized Linear Models

Decision Tree

Neural Network

Forest

Gradient Boosting

Factorization Machine

Support Vector Machine

Evaluate and Implement

Assess

Scoring

FOREST

Forest or PROC FOREST used for classification models.

Generates many trees from different samples of training data.

Mode of all predictions is final prediction

Forest Competitive Differentiators

- Distributed and massively parallel
- Faster, more memory-efficient, and more scalable algorithm
- Deployable – Generated rules





Supervised Learning

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Gradient Boosting

Gradient Boosting or GRADBOOST used for classification models.

Also generates many trees from different samples of training data.

Optimization of a loss function for model.

GB Competitive Differentiators

- Distributed and massively parallel
- Faster, more memory-efficient, and more scalable algorithm
- Deployable

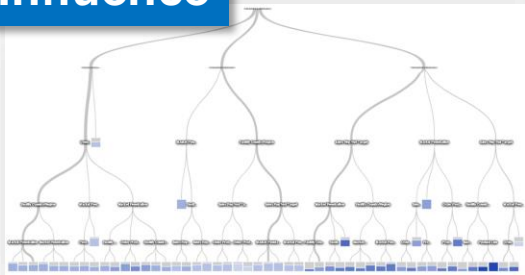


AUTOMATION: AVOID RECODE, BUILD FEEDBACK

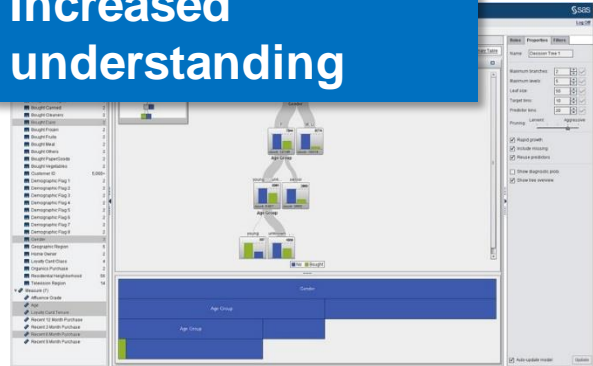


ACCESSIBLE BOTH CREATORS AND CONSUMERS

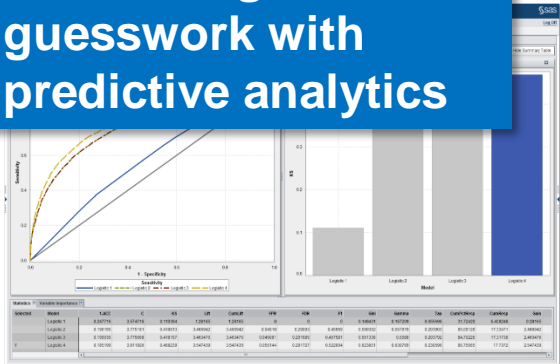
Influence



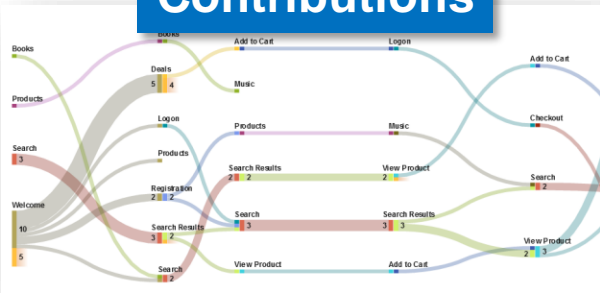
Increased understanding



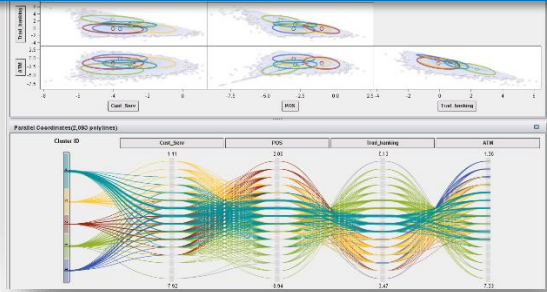
Eliminating guesswork with predictive analytics



Contributions



Data driven exploration





Olivier Goethals @Oligobe · 13 okt.

Machine learning. @AndrewPease123 Be careful never to confuse Data for Lore. Get ethics right! #SFBL16 @SASbelux



← 2 ❤️ 8 ⋮





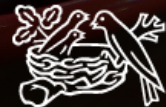
What can we do?

- Be informed consumers
- Educate as producers
- Question our methodology
- Think through scenarios
- Automate
 - Deployment
 - Testing
 - Recalibration
 - Monitoring

Social media and supply chain mean big data opportunities



Nestle has a global approach to analytics with SAS



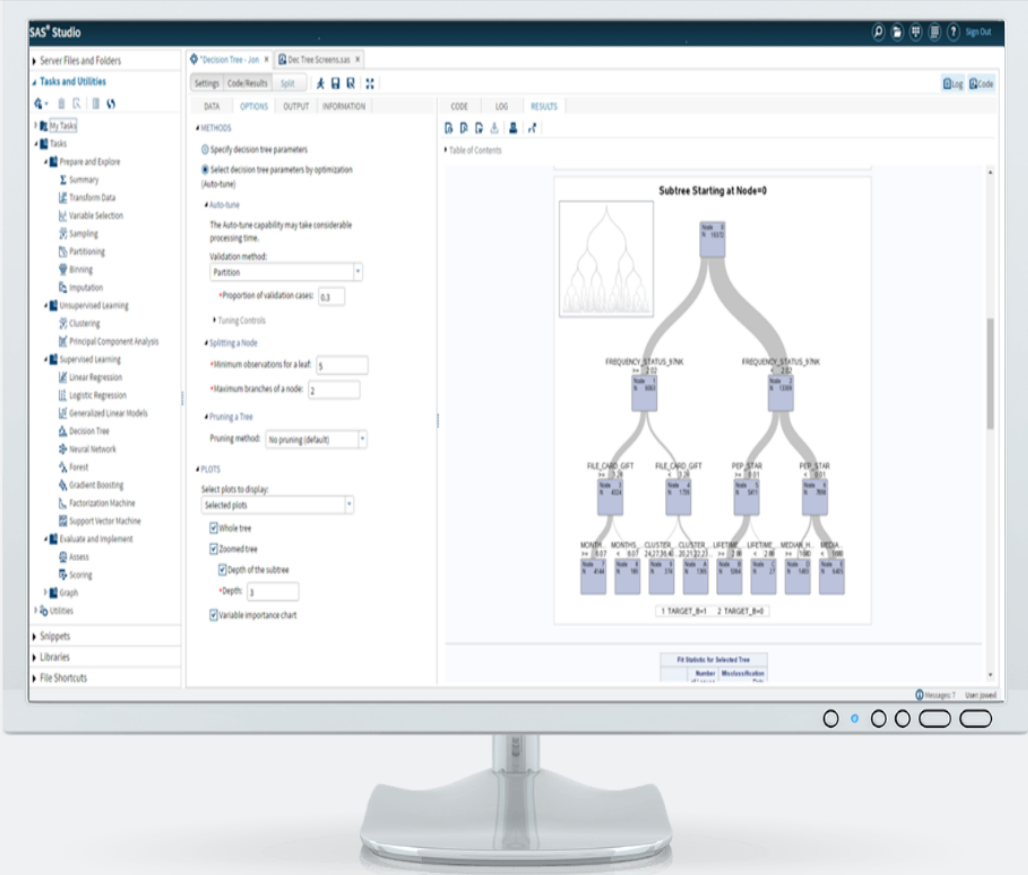
Nestlé

Using sensor data to keep the world rocking



Barco uses SAS for predictive asset maintenance.





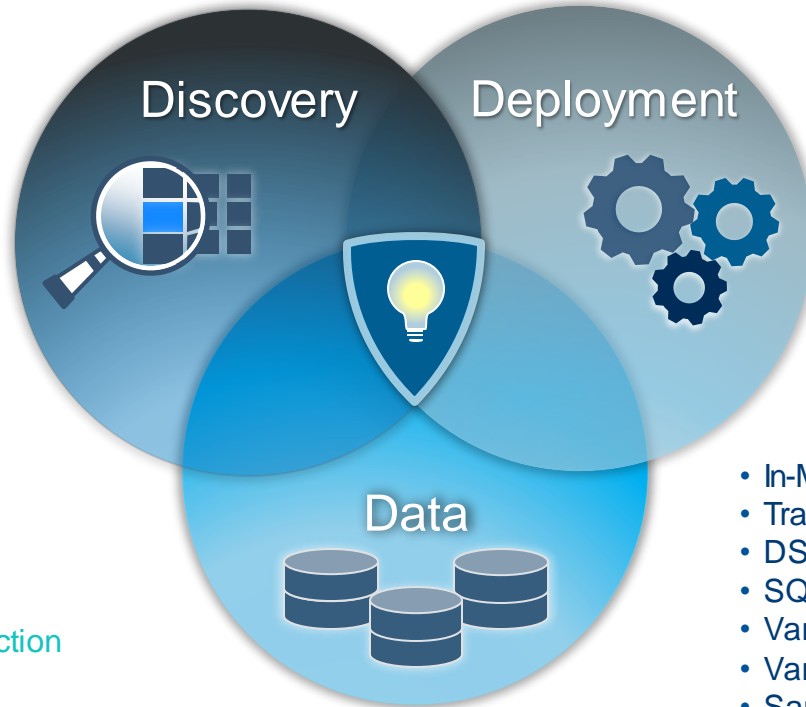
Solve complex analytical problems faster.

Get breakthrough performance from predictive modeling and machine-learning capabilities running on SAS® Viya™, our new in-memory platform. In-memory data persistence eliminates the need to load data multiple times during iterative analysis. Multiple users can collaborate easily, exploring the same raw data and building models simultaneously. You'll measure processing time for analytical modeling in seconds or minutes – not hours – and find solutions to challenging problems faster than ever.

SAS ANALYTICS IN ACTION - VDMML



- Logistic Regression
- Linear Regression
- Generalized Linear Models
- Nonlinear Regression
- Ordinary Least Squares Regression
- Decision Trees
- Partial Least Squares Regression
- Quantile Regression
- K-means and K-modes Clustering
- Principal Component Analysis
- Random Forest*
- Gradient Boosting*
- Neural Networks
- Support Vector Machines*
- Factorization Machines*
- Network Analytics/Community Detection
- Text Mining
- Boolean Rules
- Auto-tuned Hyper-parameters



- Assess Supervised Models
- Analytic Item Store*

- In-Memory Data Step
- Transpose
- DS2
- SQL
- Variable Binning
- Variable Cardinality Analysis
- Sampling and Partitioning
- Missing Value Imputation
- Variable Selection

Thank You

