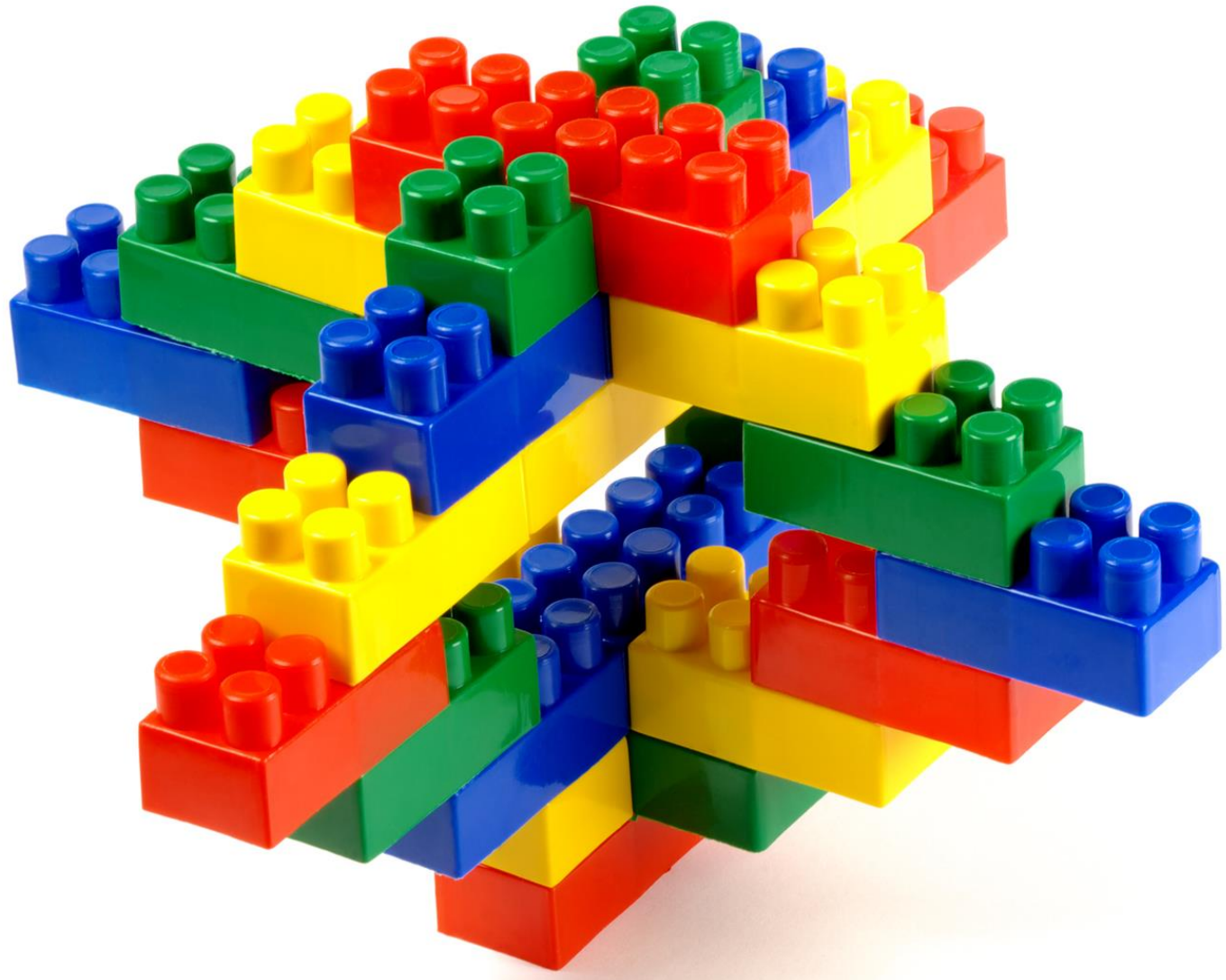
Building AI Applications using SAS

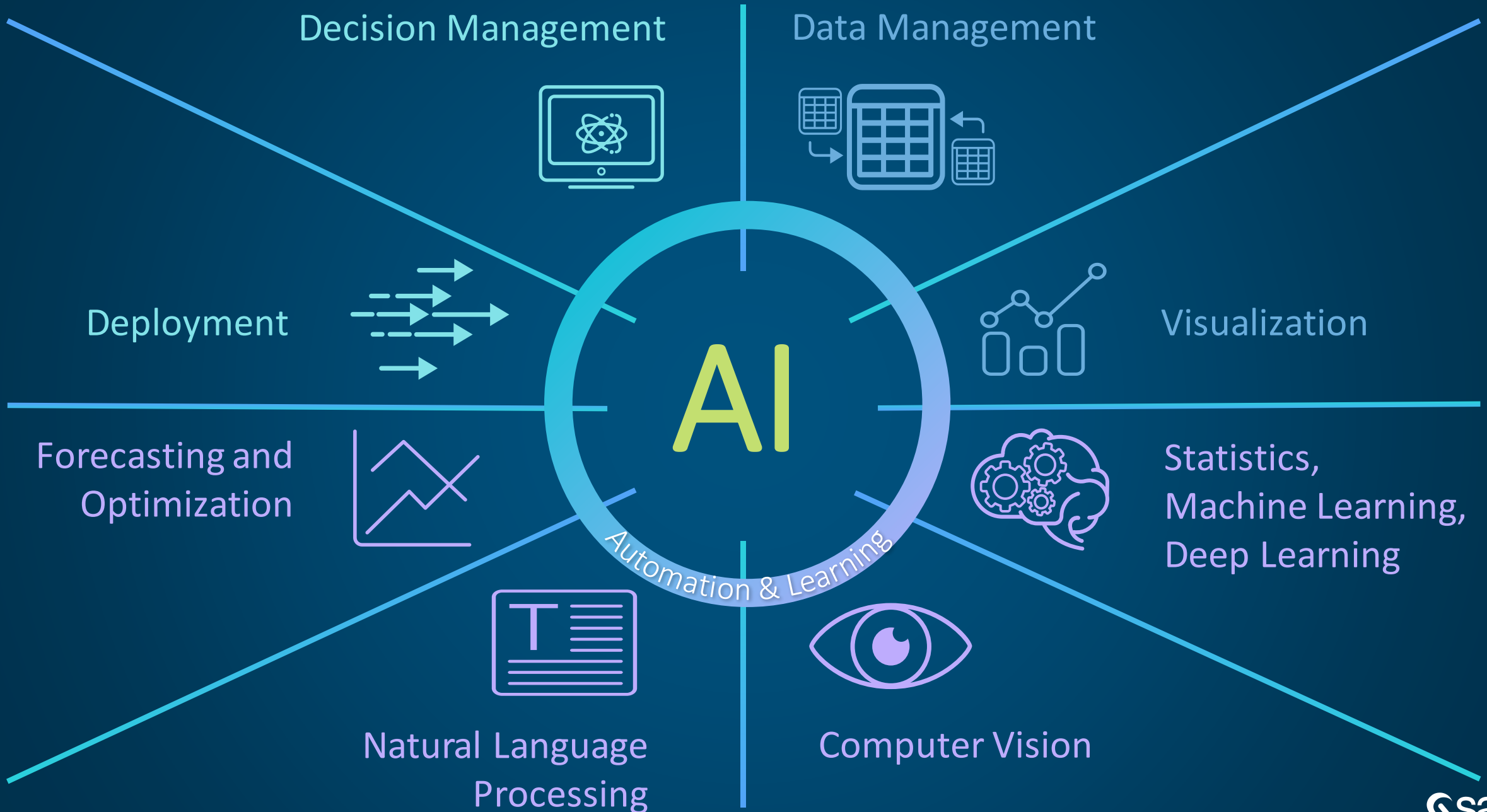
Felix Liao

Head of Analytics Platform

SAS Australia & New Zealand

#Road2AI





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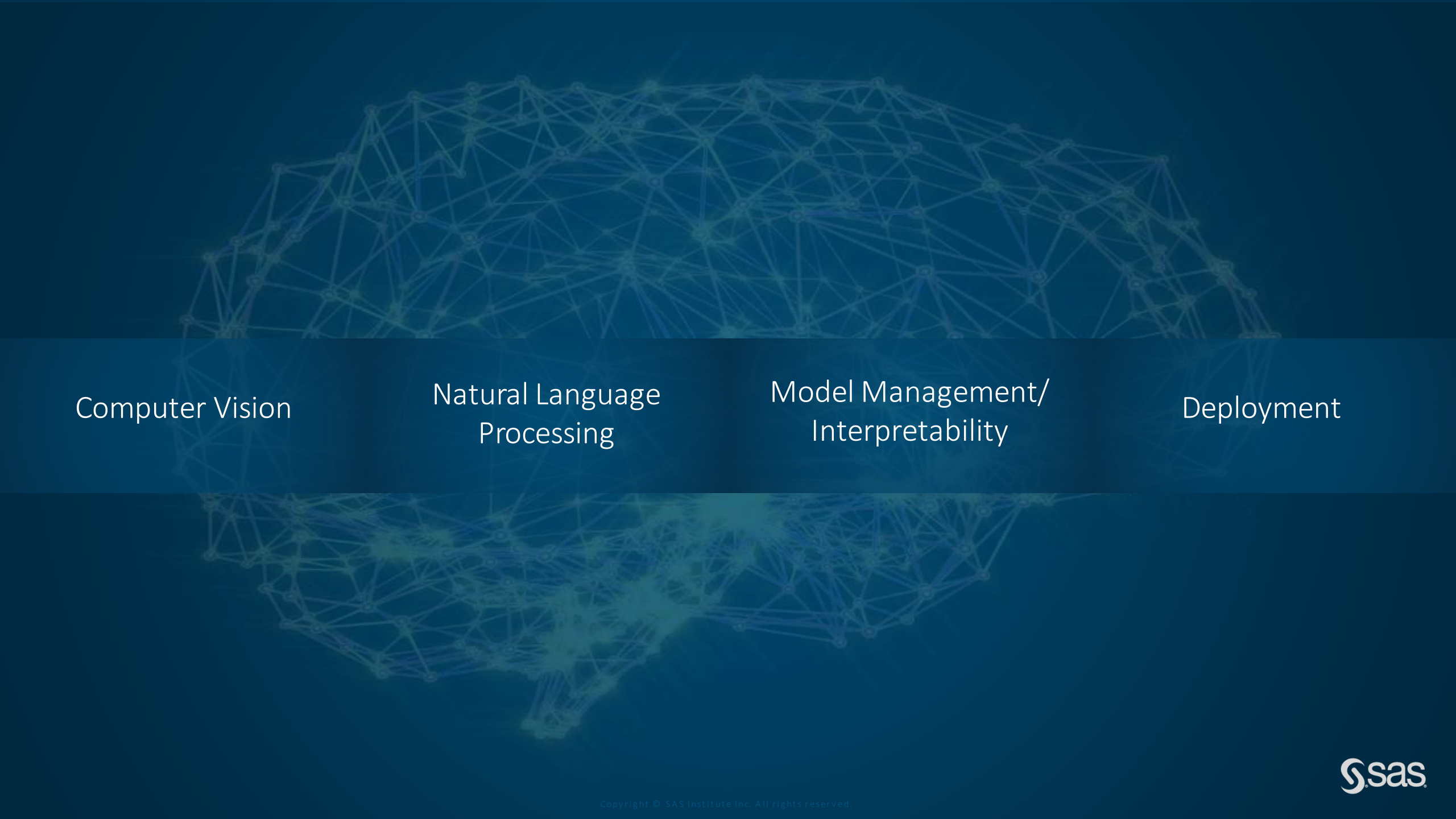

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What is Deep Learning?

Deep Learning is a type of machine learning used in recognizing speech, identifying objects in images and more.

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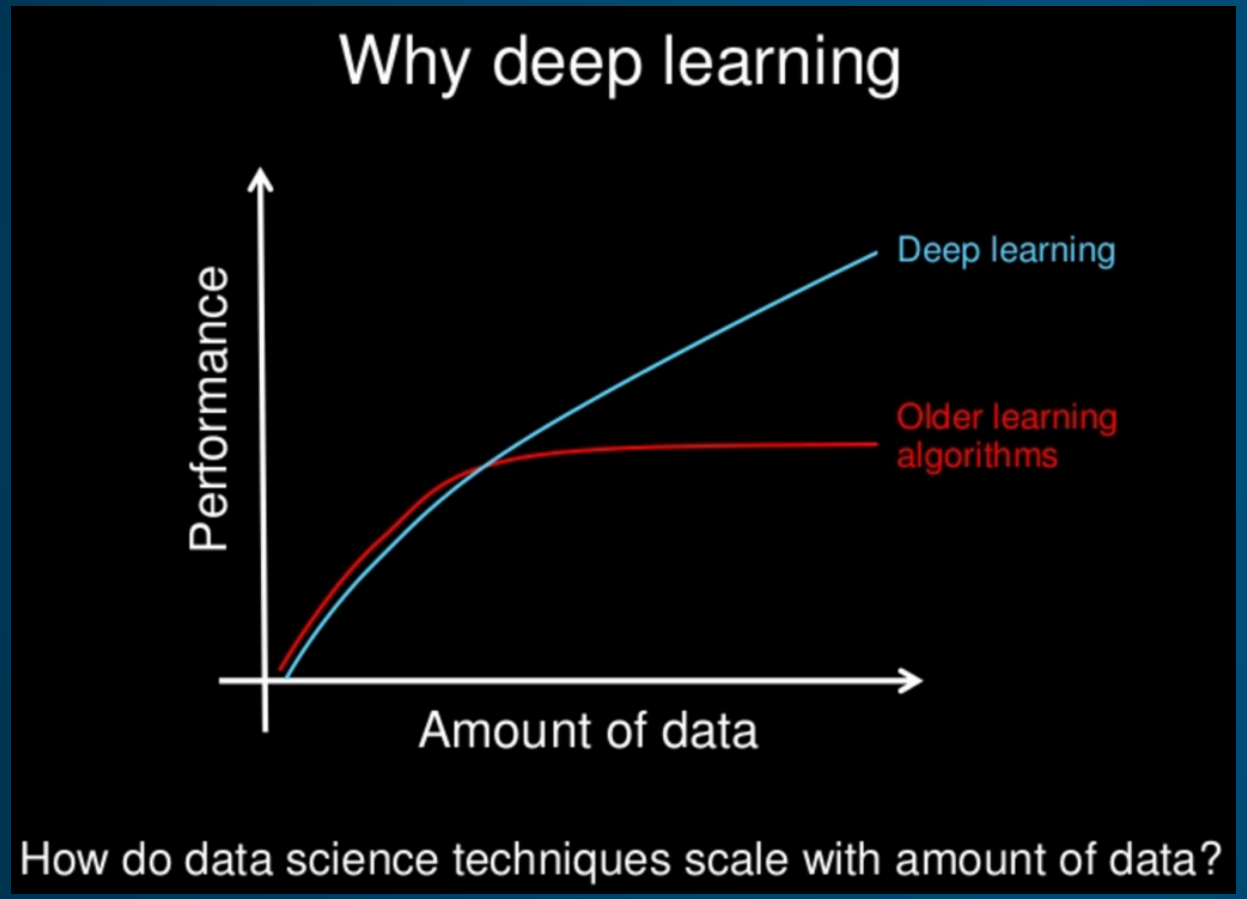
Why Deep Learning/Neural Network?



Natural Language

Computer Vision

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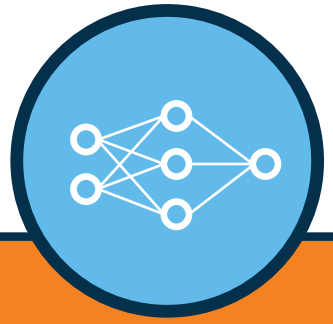
SAS Deep Learning Capabilities

- Tabular
- Sequence
- Time Series
- Image
- Audio
- Text

- Batch Norm
- Concatenate
- Convolution
- Fully Connected
- Pooling
- Projection
- Recurrent
- Reshape
- Residual
- Scale



- VGG
- DenseNet
- CNN
- ResNet
- Yolo v1
- Yolo v2
- Vanilla RNN
- LSTM
- GRU
- Bidirectional RNN

- Regression
- Classification
- Forecasting
- Auto-encoder
- Object Detection
- Keypoint Detection
- Speech-to-Text
- Sequence labeling
- Text generation

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sassoftware / python-dlpy

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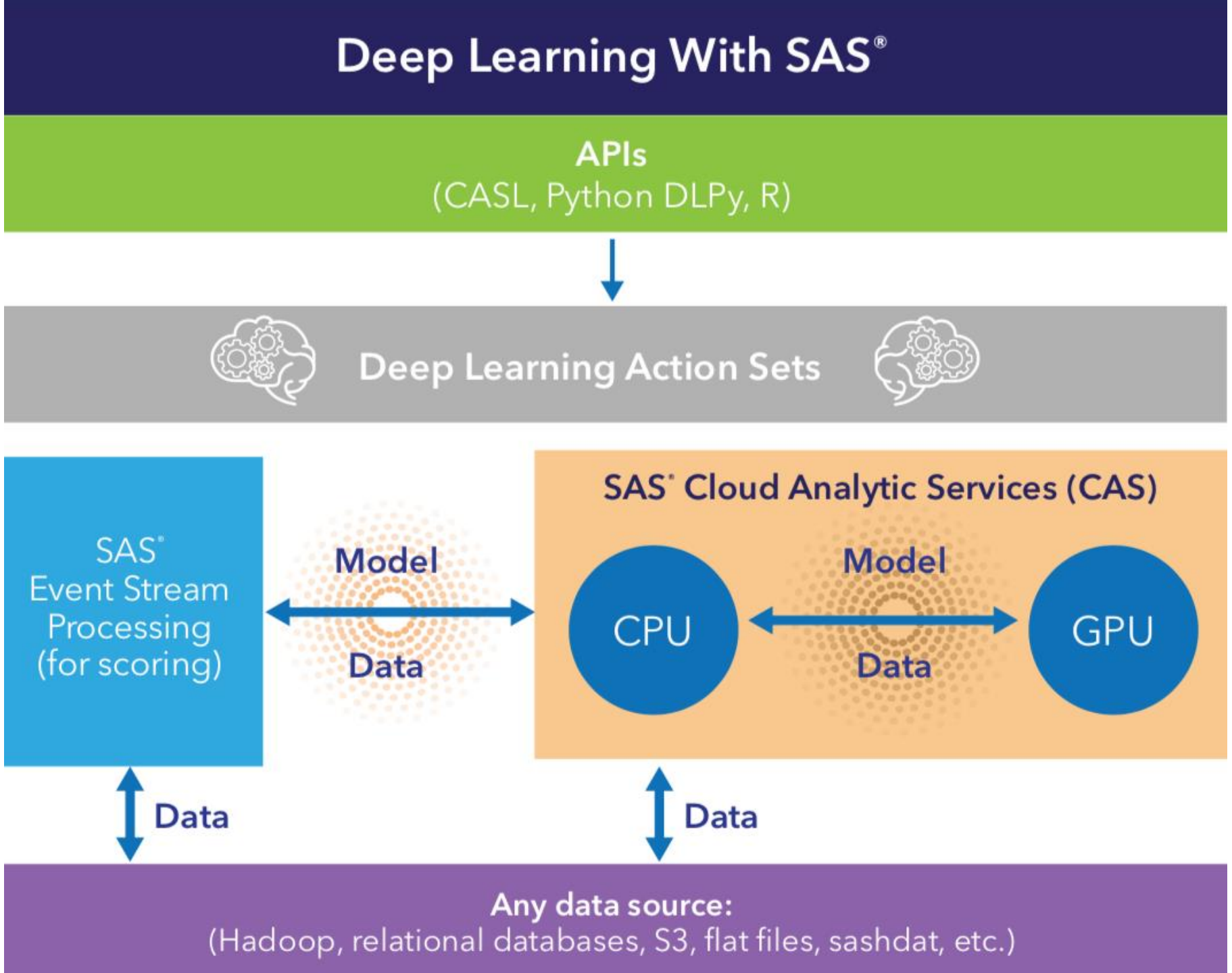
The SAS Deep Learning Python (DLPy) package provides the high-level Python APIs to deep learning methods in SAS Visual Data Mining and Machine Learning. It allows users to build deep learning models using friendly Keras-like APIs.

791 commits | **2** branches | **10** releases | **15** contributors | Apache-2.0

Branch: **master** | New pull request | Find File | Clone or download

ethem-kinginthenorth fixes #197 — Latest commit 8ea0885 2 days ago

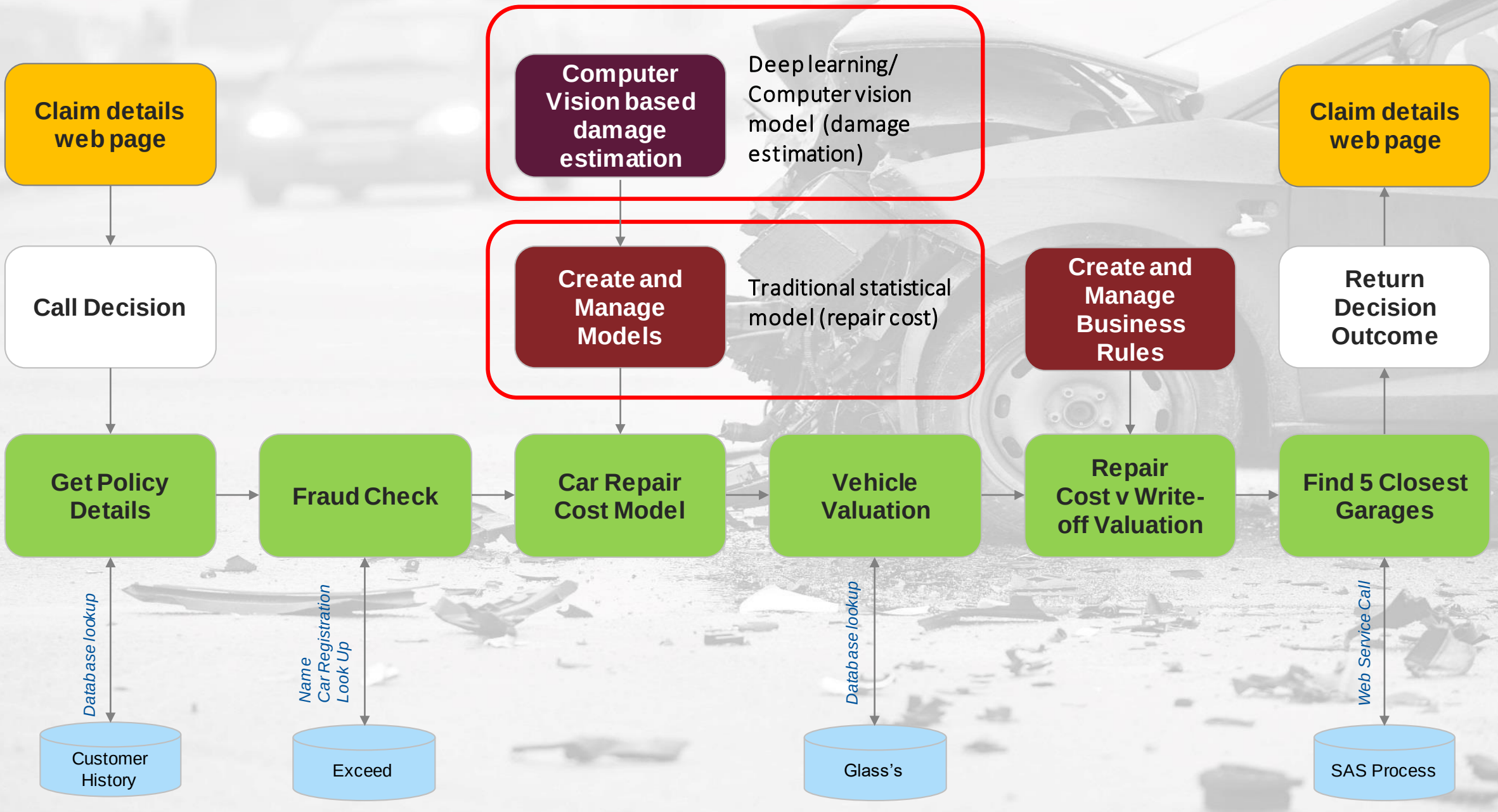
dlpy	fixes #197	2 days ago
doc	- pre release stuff	20 days ago
examples	table of contents fix	25 days ago
.gitattributes	Review and reformat docstrings; add Sphinx directory; add contributor...	2 years ago
.gitignore	adding an item to gitignore	3 months ago
CHANGELOG.md	- pre release stuff	20 days ago
CONTRIBUTING.md	initial push to dlpy v1	10 months ago
ContributorAgreement.txt	Review and reformat docstrings; add Sphinx directory; add contributor...	2 years ago
LICENSE.txt	Review and reformat docstrings; add Sphinx directory; add contributor...	2 years ago


Deep Learning With SAS®
APIs
(CASL, Python DLPy, R)
Deep Learning Action Sets
SAS® Event Stream Processing (for scoring)
Model
Data
SAS® Cloud Analytic Services (CAS)
CPU
Model
Data
GPU
Data
Data
Any data source:
(Hadoop, relational databases, S3, flat files, sashdat, etc.)

Computer Vision

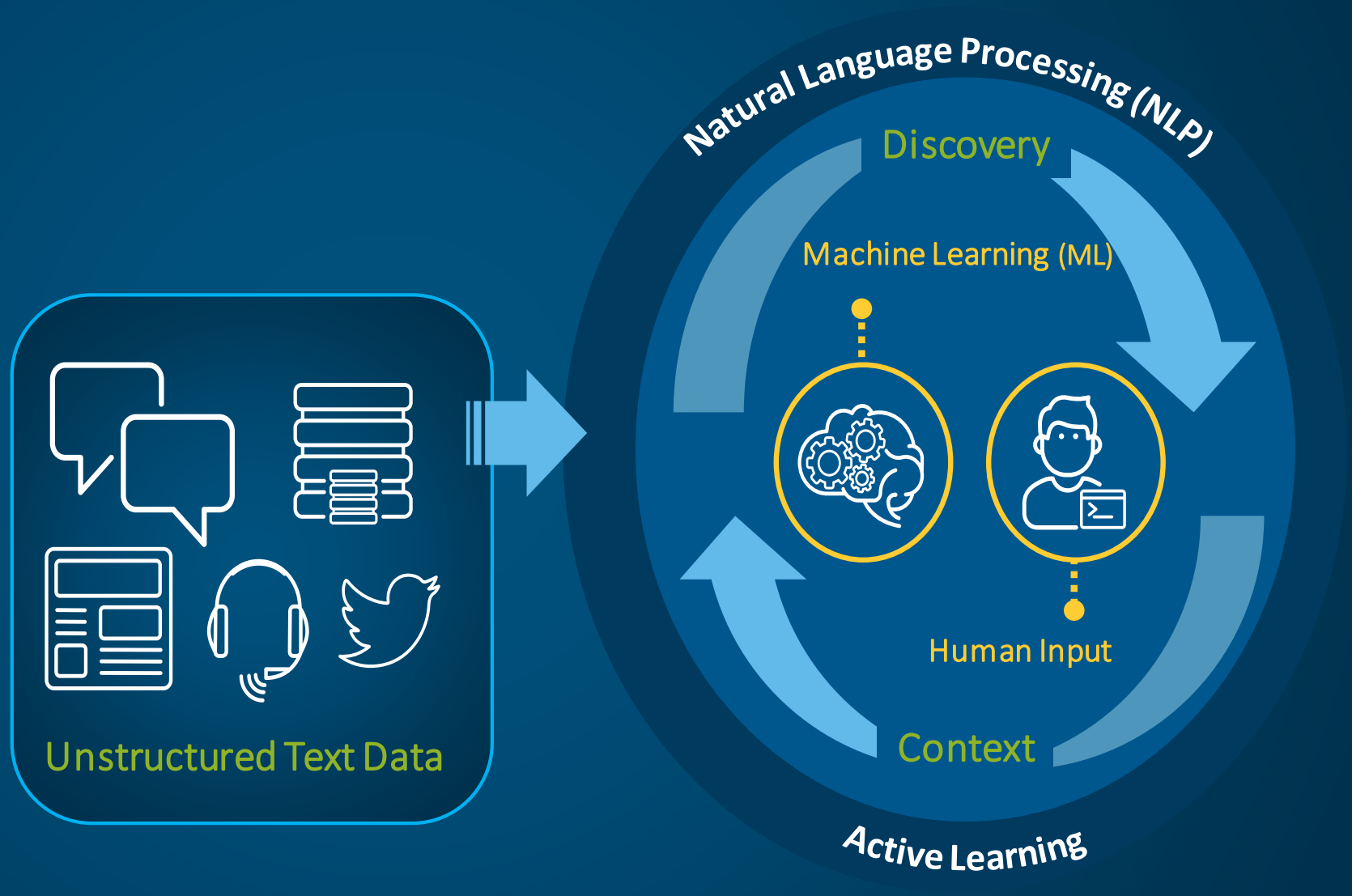
Computer Vision enables systems to see, identify and process images or videos in the same way that human vision does

REAL-TIME CLAIMS - FIRST NOTIFICATION OF LOSS DECISIONING



Natural Language Processing (NLP)

NLP enabled computers to understand, interpret and manipulate human language.

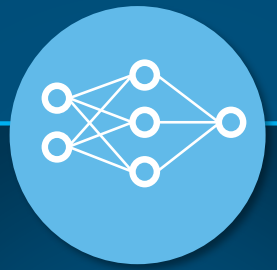


Hybrid Approach to Text Analytics

Rule Based

Segmentation
Tokenization
Lemmatization
Part-of-Speech tagging
Concept extraction
Sentiment analysis
Categorization

Supervised



Language modeling
Part-of-speech tagging
Named entity recognition
Sentiment analysis
Categorization
Rule generation
Text Summarization

Unsupervised

Topic Recognition
Component Analysis

Deep Learning

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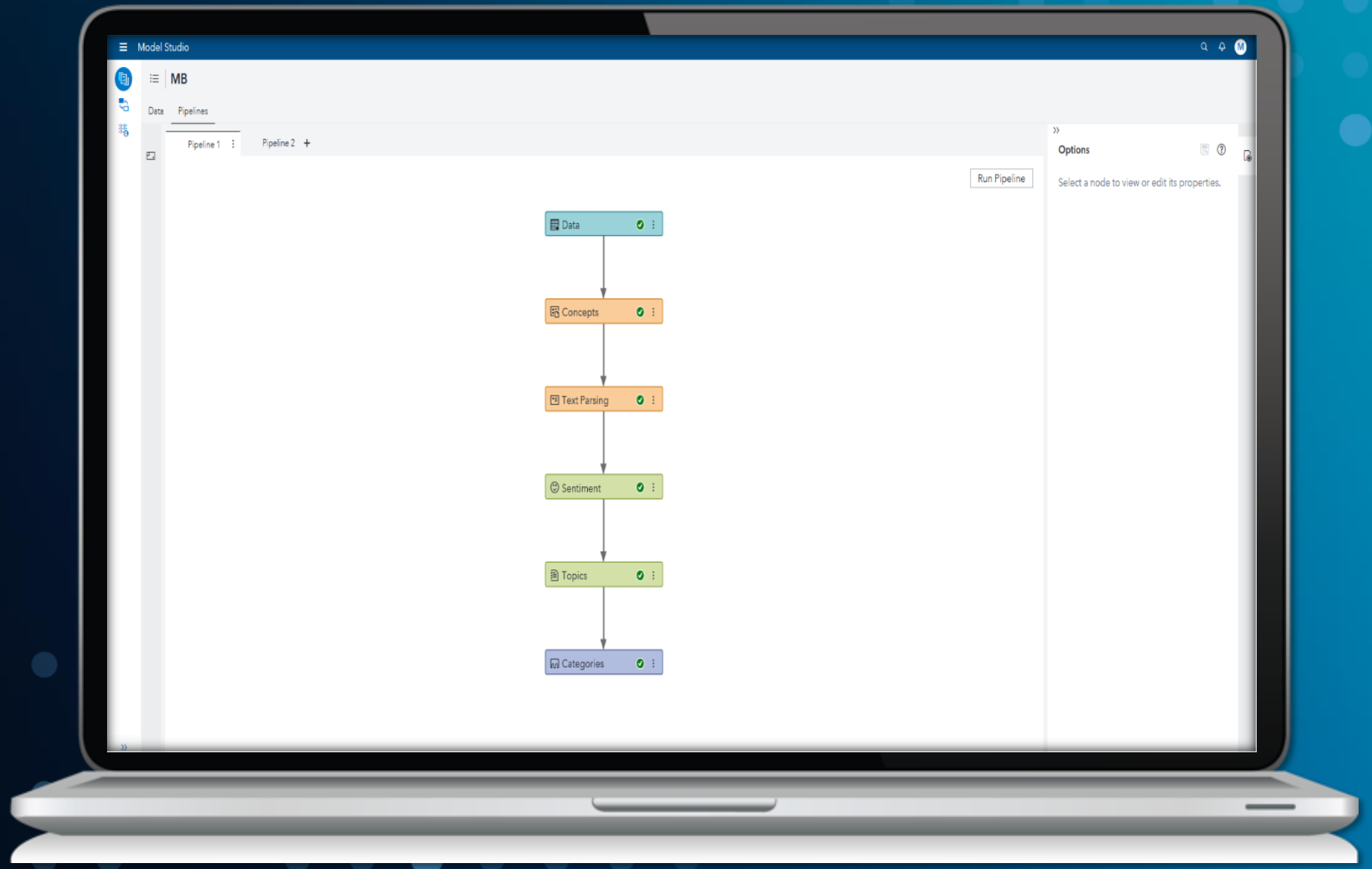
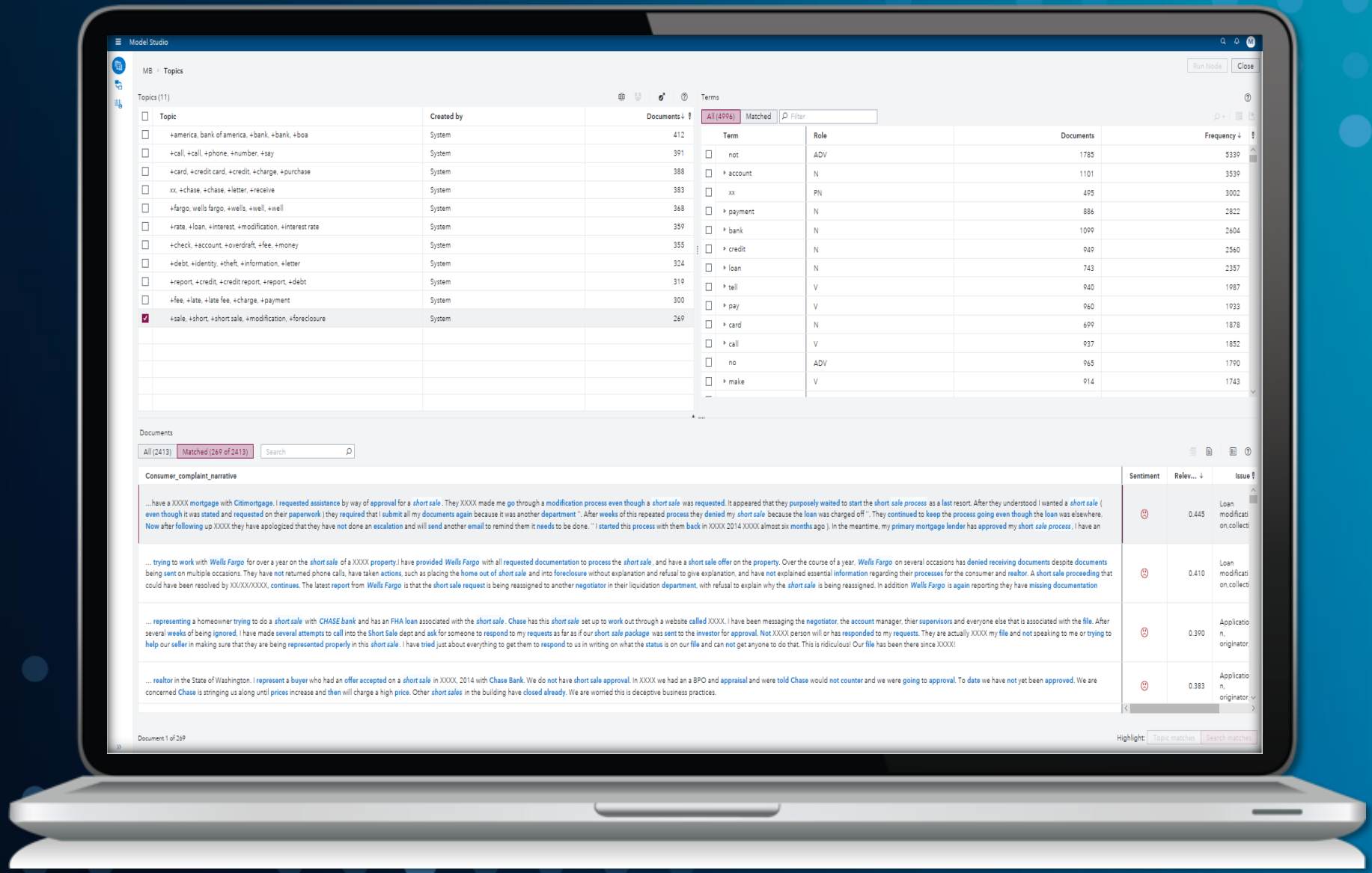
Pipeline based development paradigm

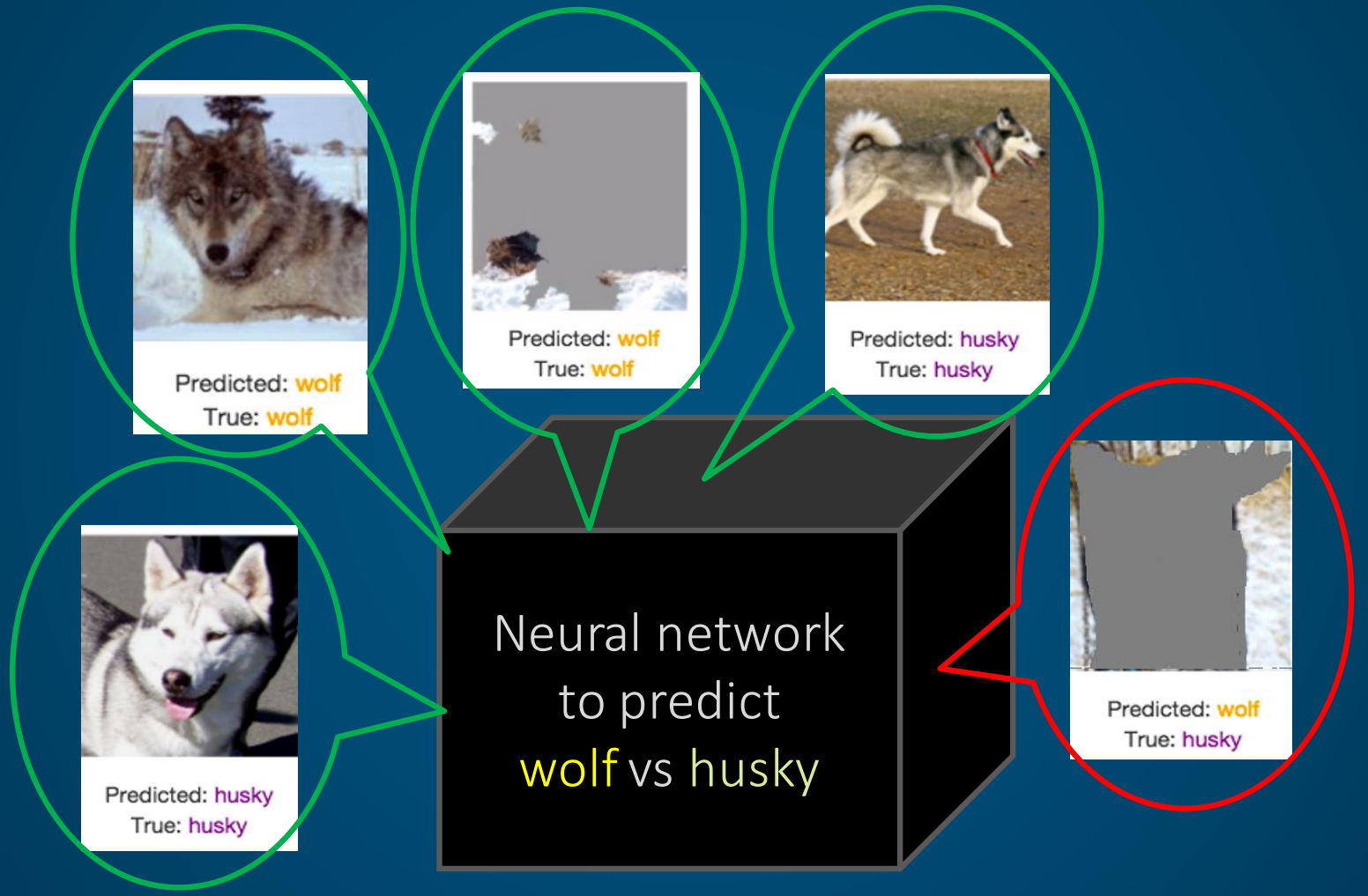


Automated Text Parsing/Topic Discovery



why?

Why you need explainable ML



"Why Should I Trust You?": Explaining the Predictions of Any Classifier
Marco Tulio Ribeiro, Sameer Singh, Carlos Guestrin.
ACM SIGKDD, 2016

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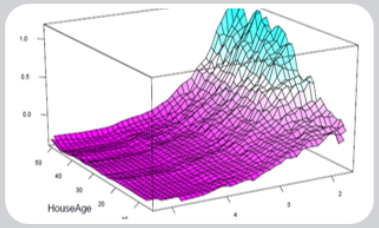
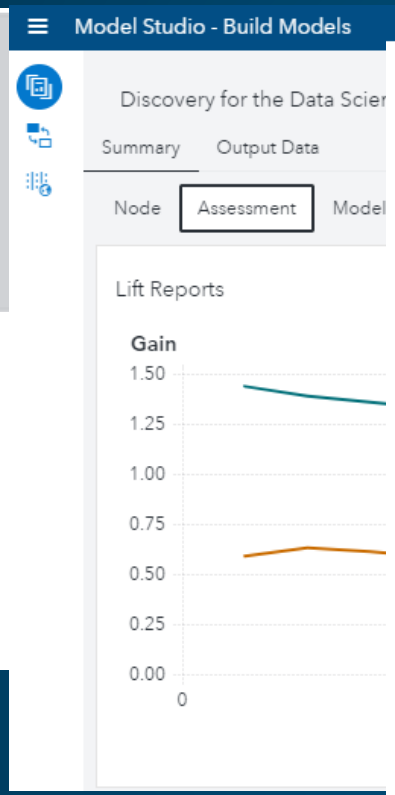
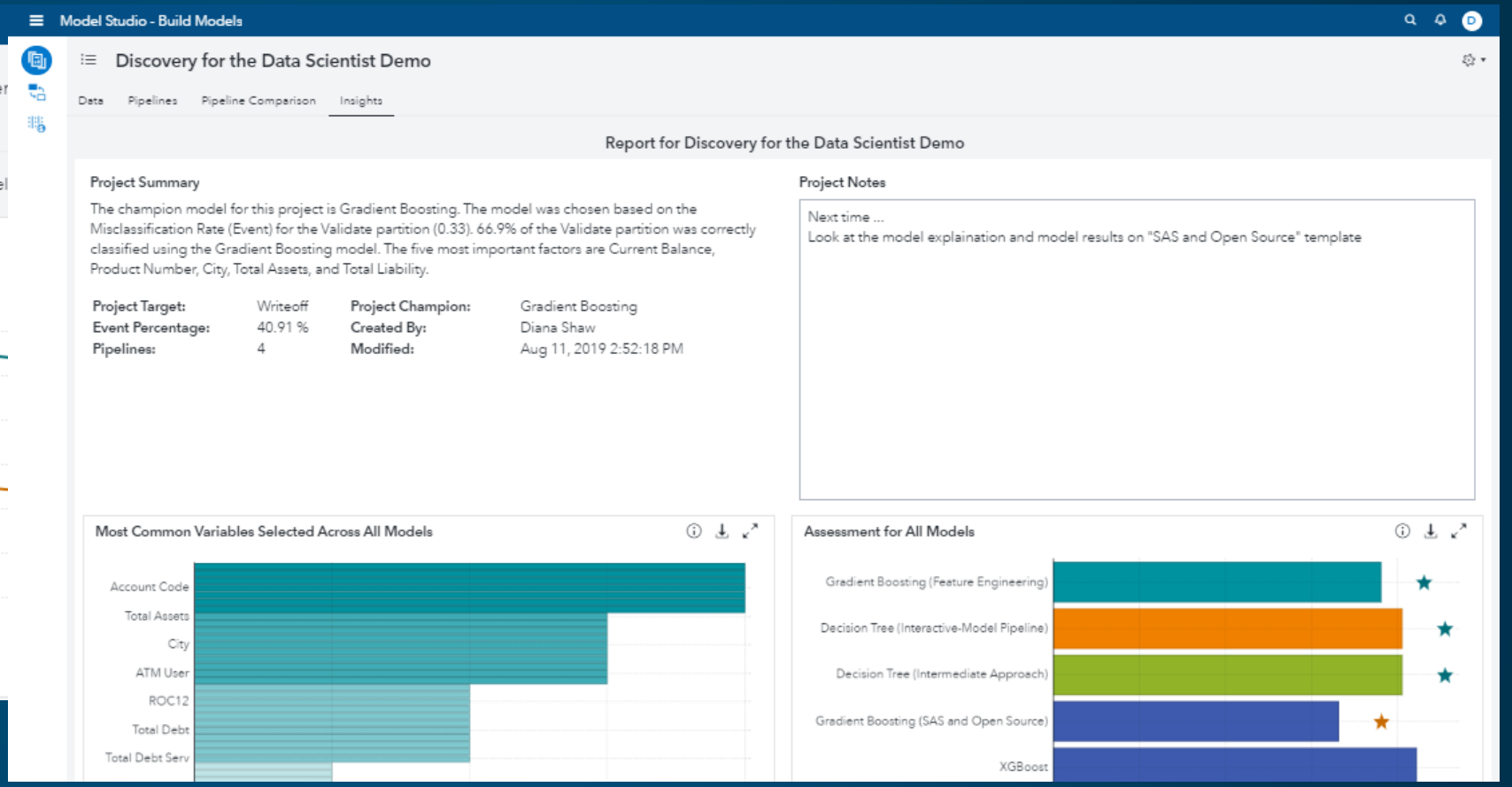
With explainable AI



Partial Dependence Plots

depicts relationship between the value of an input variable and the value of the model predictions after the influence of all other variables has been averaged out





"To build trust with users and stakeholders, application leaders must make AI models more interpretable and explainable" Gartner

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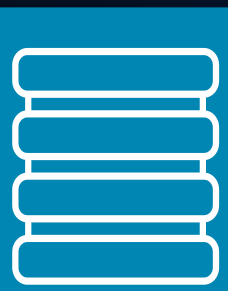
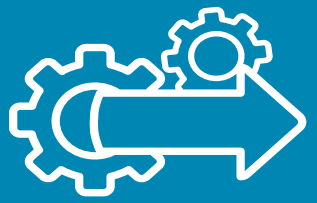
From Data Science Experiments To AI applications

Automated Deployment Options

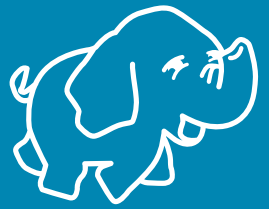
In database



In Stream



In Hadoop

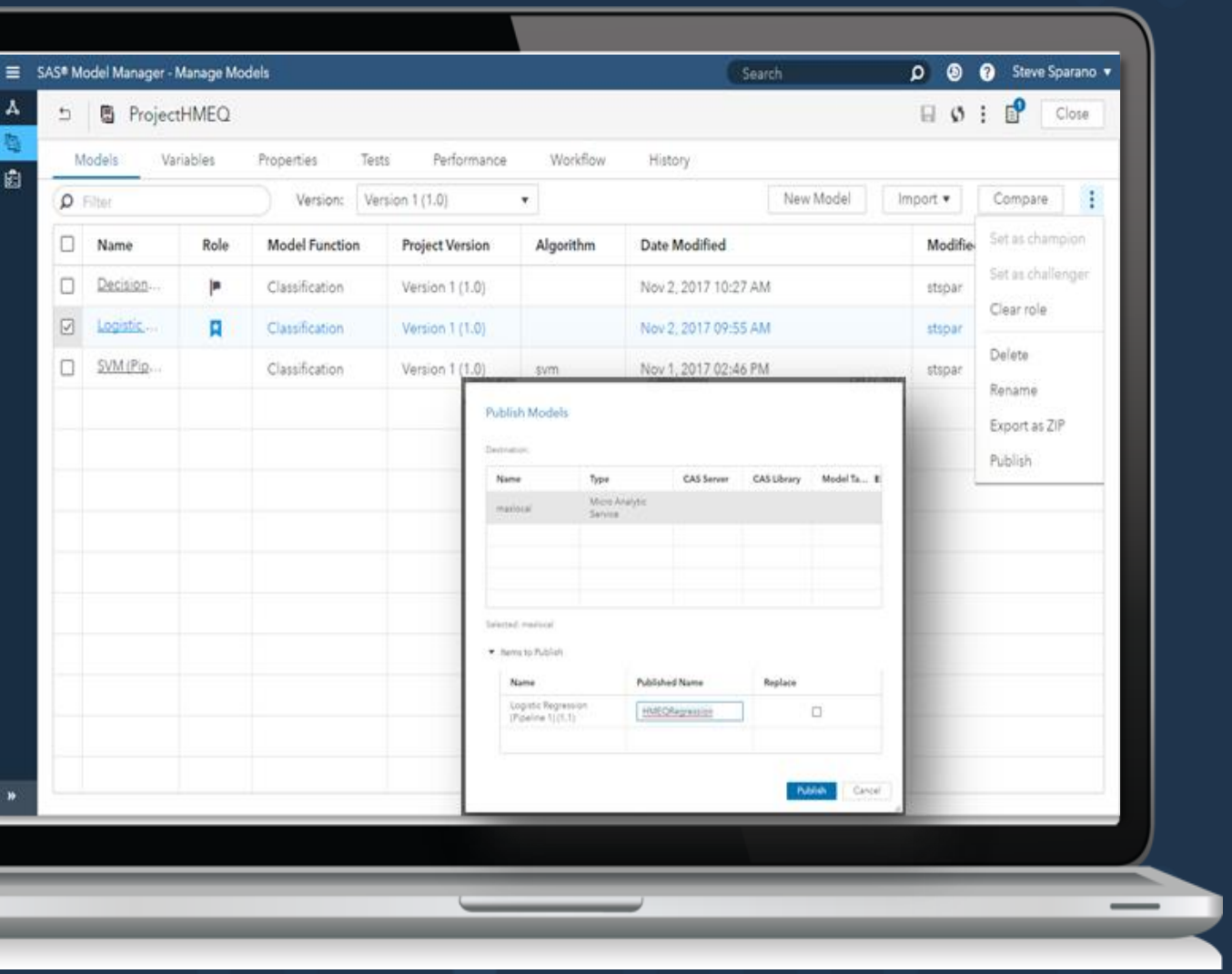


Cloud Ready

Hybrid

Deployment

Fast and Easy Model Deployment



- One Click Deployment
- Manage & operationalize open source models

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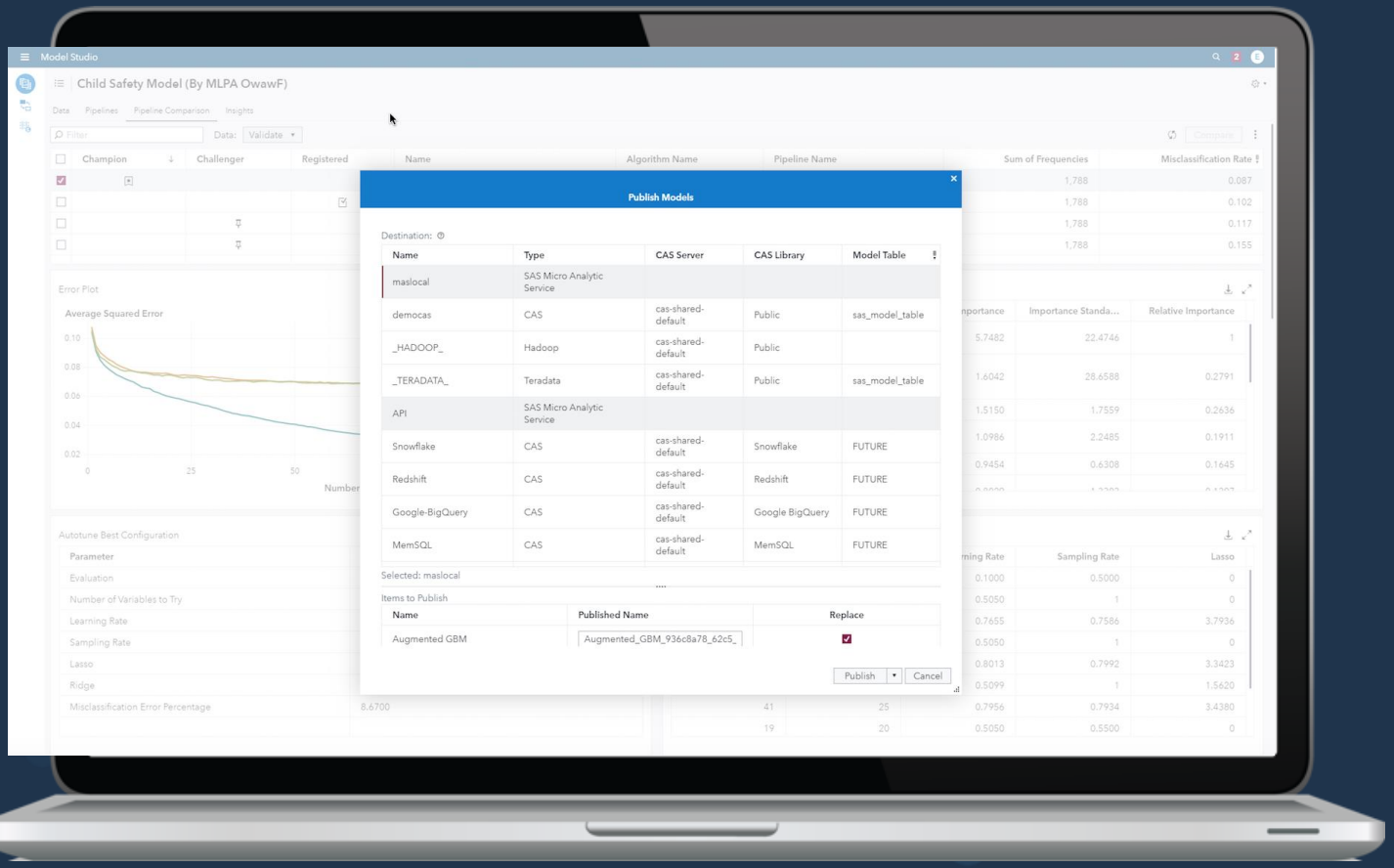
Deployment

Build Once, Deploy Anywhere



- Publish to different production environments
- Deploy in-batch, streaming, cloud or edge device
- Supporting ModelOps

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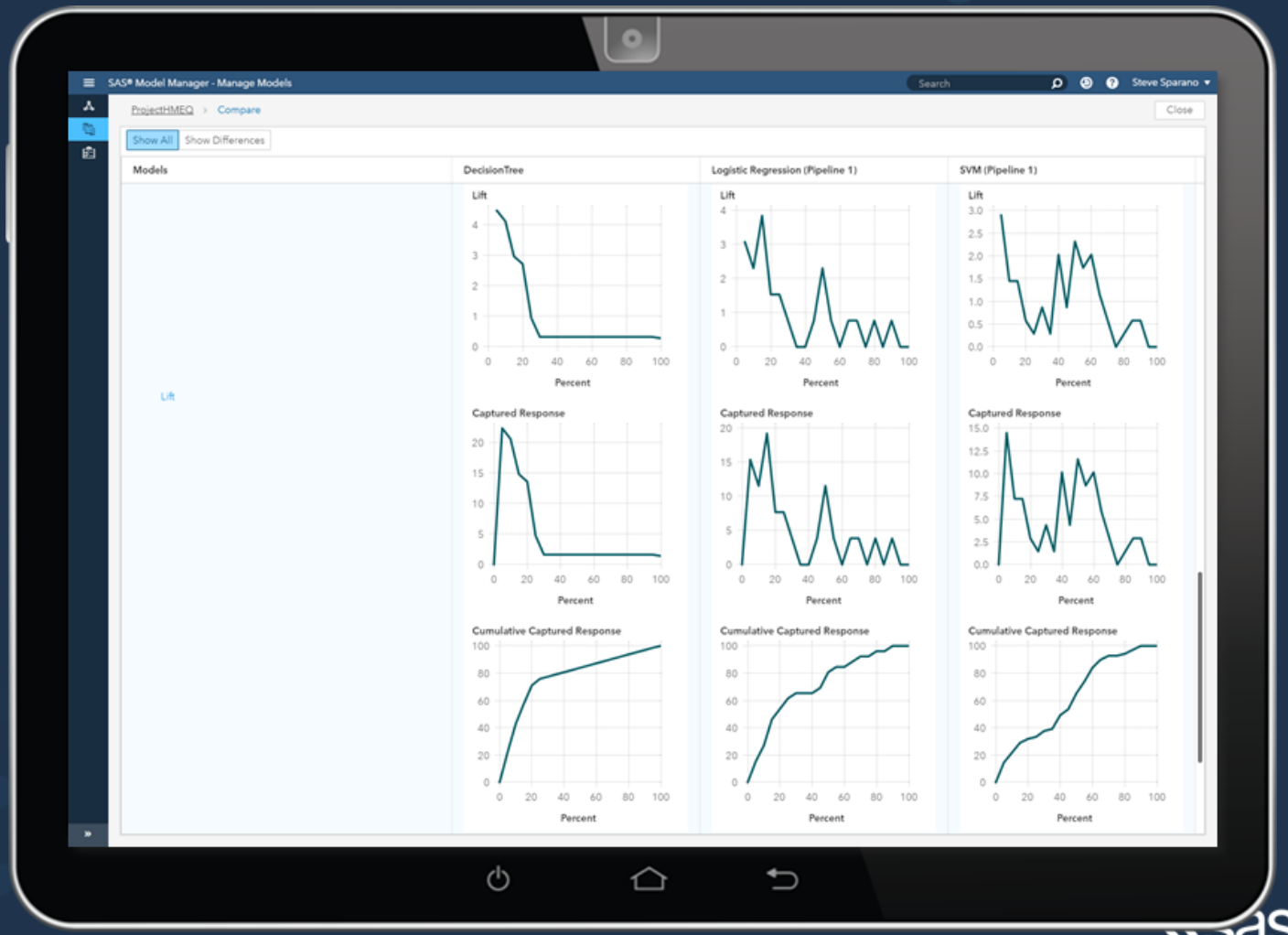
Deployment

Monitor and Improve

- Out of the box performance reports
- Performance-monitoring tasks including data source and time execution
- Track all model attributes post deployment



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Build AI applications with SAS

Leverage cutting edge algorithms and techniques

Deep learning, computer vision and NLP

Work the way you want to work

SAS or open source languages. Code or visual approaches

Get to application and value fast

Focus more on the application and less on the infrastructure and processes

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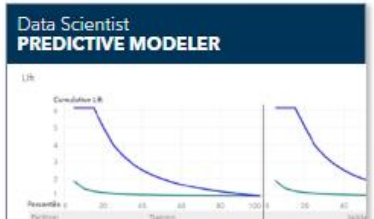

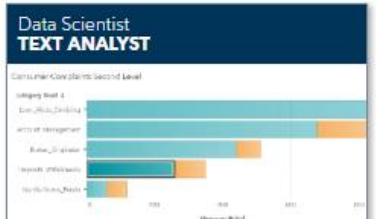

https://www.sas.com/en_us/trials.html

Thank You

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