

Commercial Lines Seminar Machine Learning

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Today's Presentation



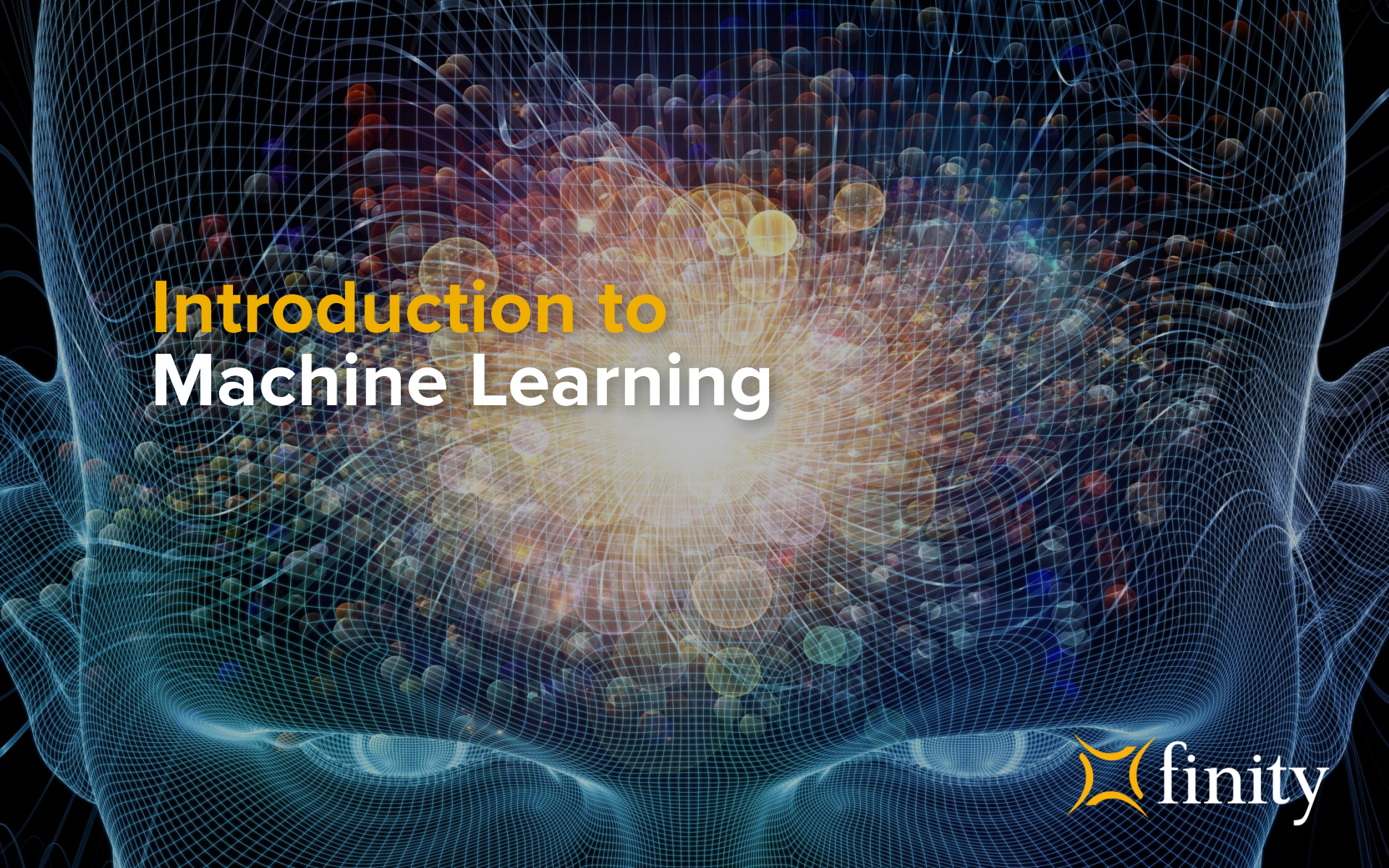
**Introduction
to Machine
Learning**



**Current
applications in
insurance**



**Applications
in Commercial
Lines**



Introduction to Machine Learning



What is Machine Learning?

“... provides computers with the ability to learn without being explicitly programmed.”



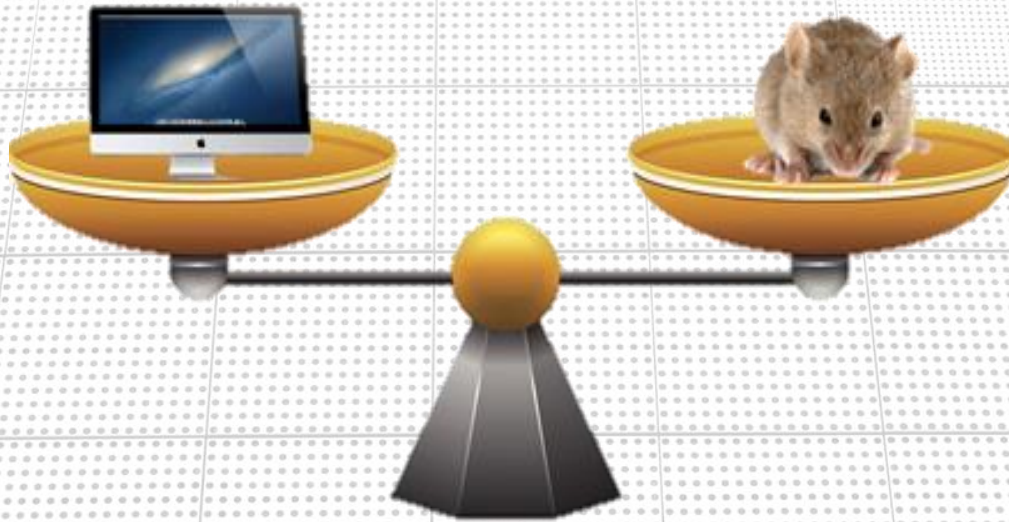
TESLA



finity

Why Now?

- Data creation is growing, exponentially
- Computing power is growing, exponentially



In a nutshell



A flexible set
of algorithms...



that can be
used with all
types of data

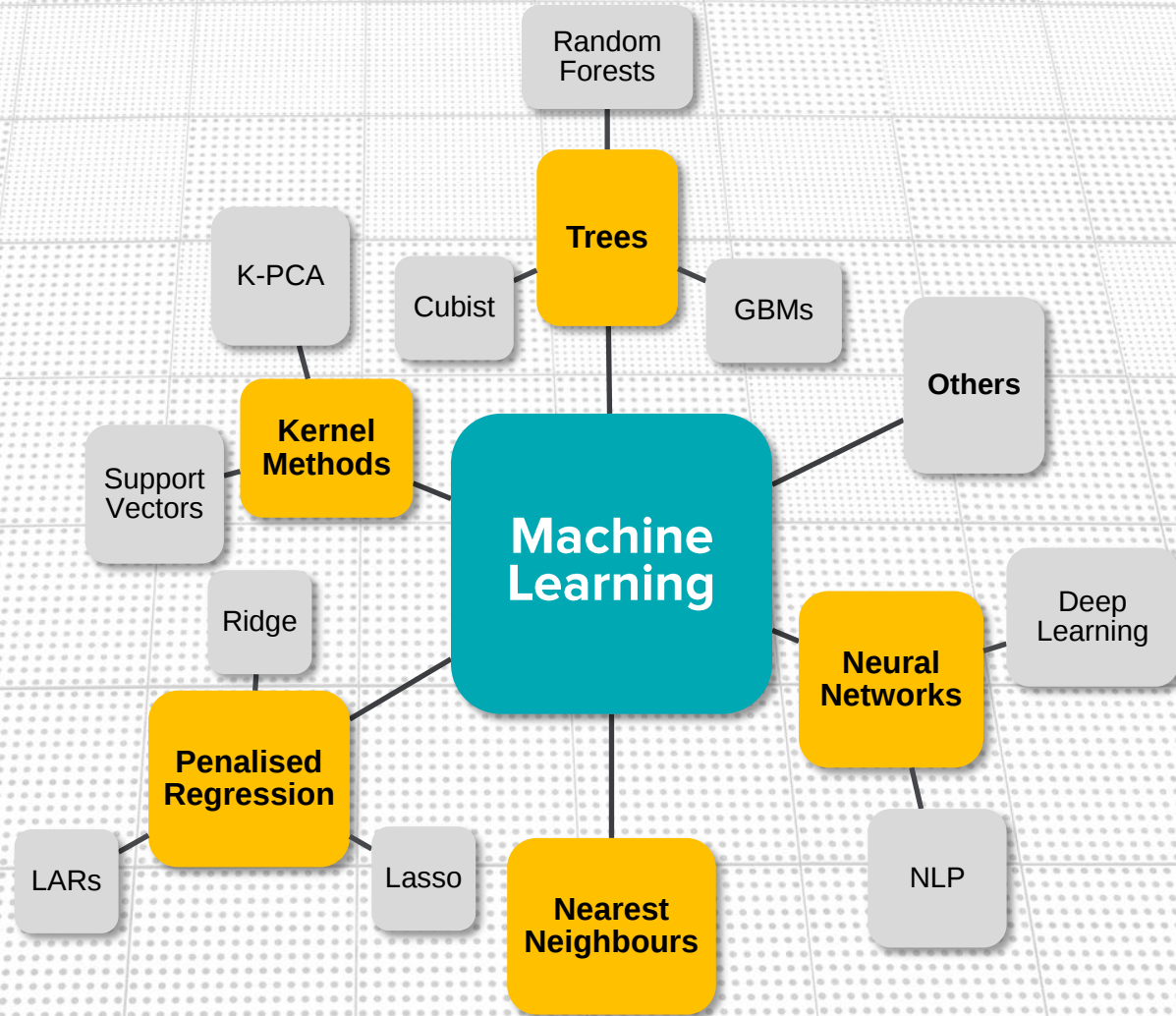


with little manual
oversight ...

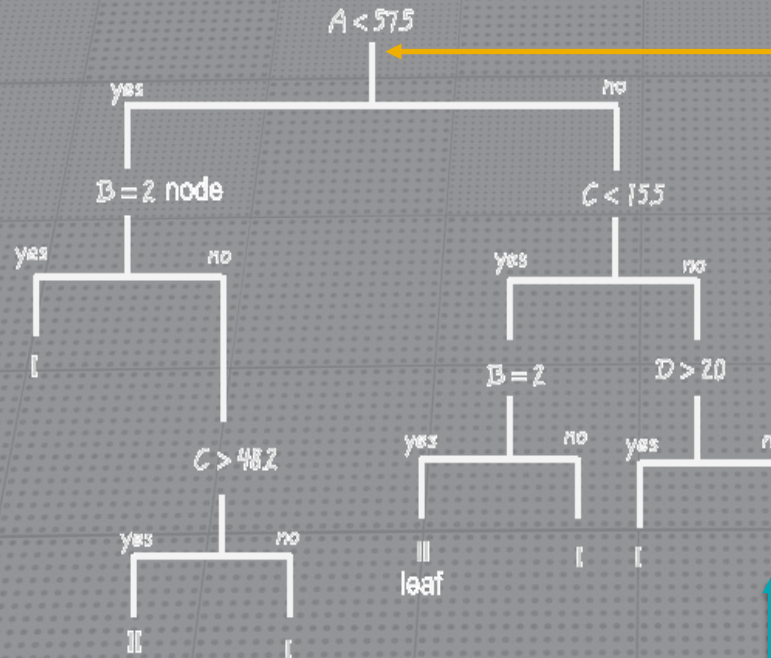


**where traditional
methods are not
viable**

Machine Learning Methods



What is a Tree?



Simple rules at each node in the tree partition the data left or right

At each terminal leaf of the tree all data points receive the same predicted value

What is a GBM?

A **Gradient Boosted Machine** is an ensemble of individual trees, fit sequentially

Gradient boosting “stacks” a series of models, each one contributing to a small reduction in the overall error



Benefits of Machine Learning



Fast



Efficient



Intuitive



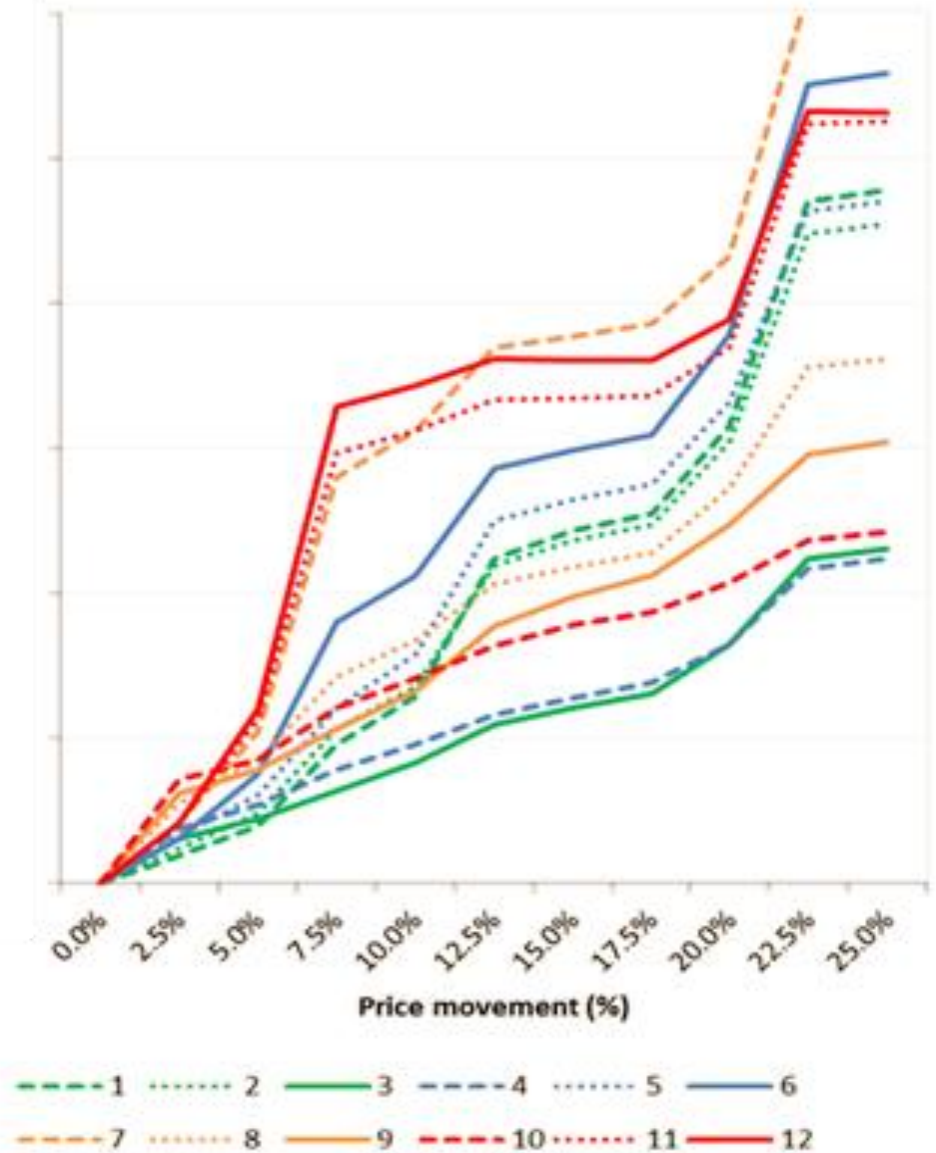
Accurate

Some insurance
applications (personal lines)



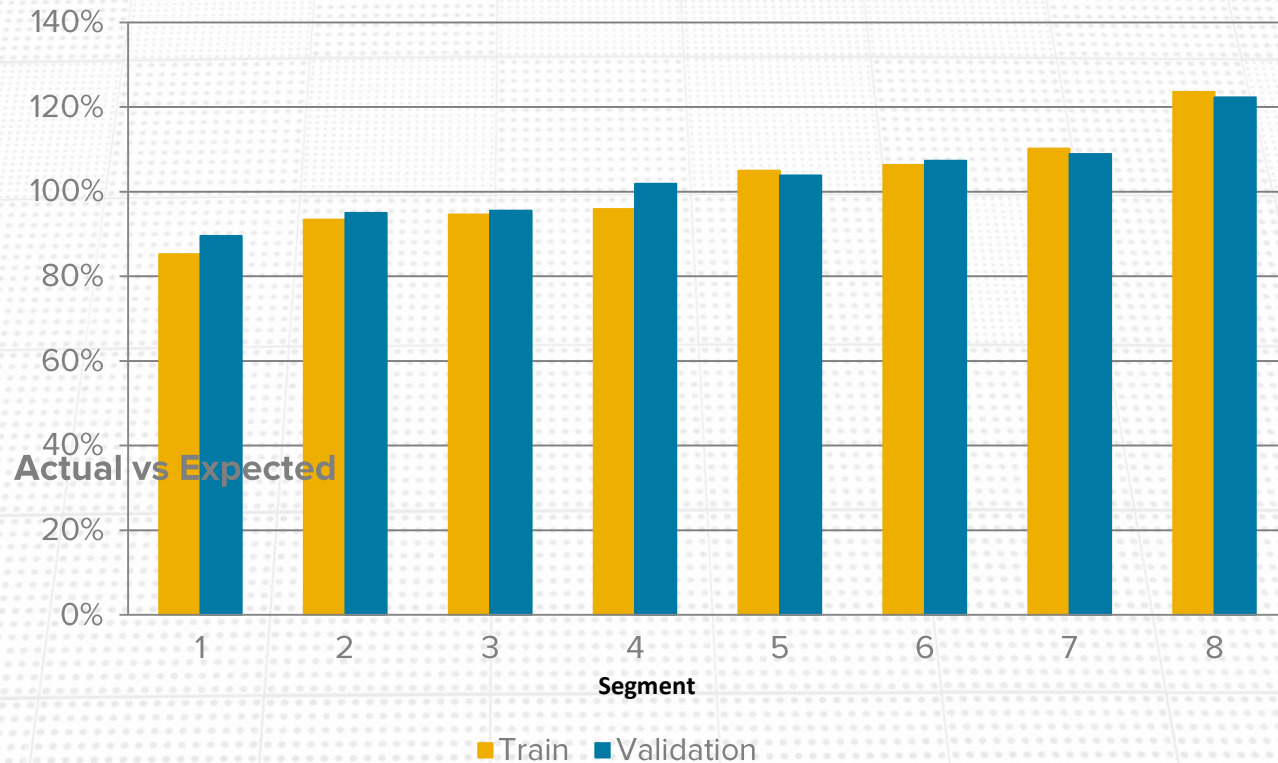
Customer Behavioural Modelling

Attrition relative to no change

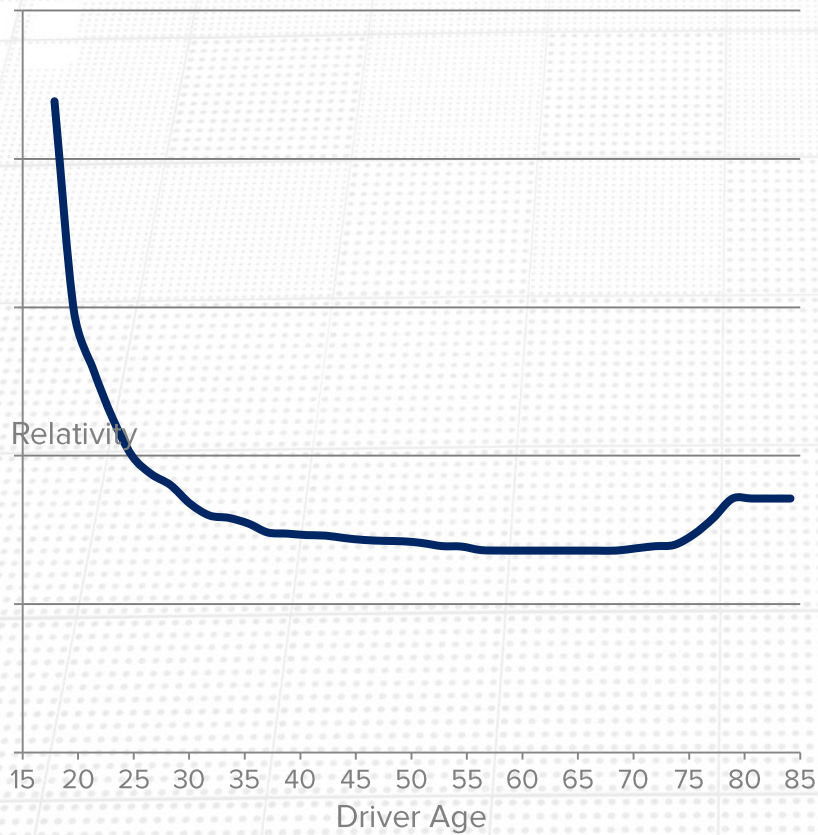


Technical Price Modelling

Model Enhancement



Competitor Rating



Tennis Betting





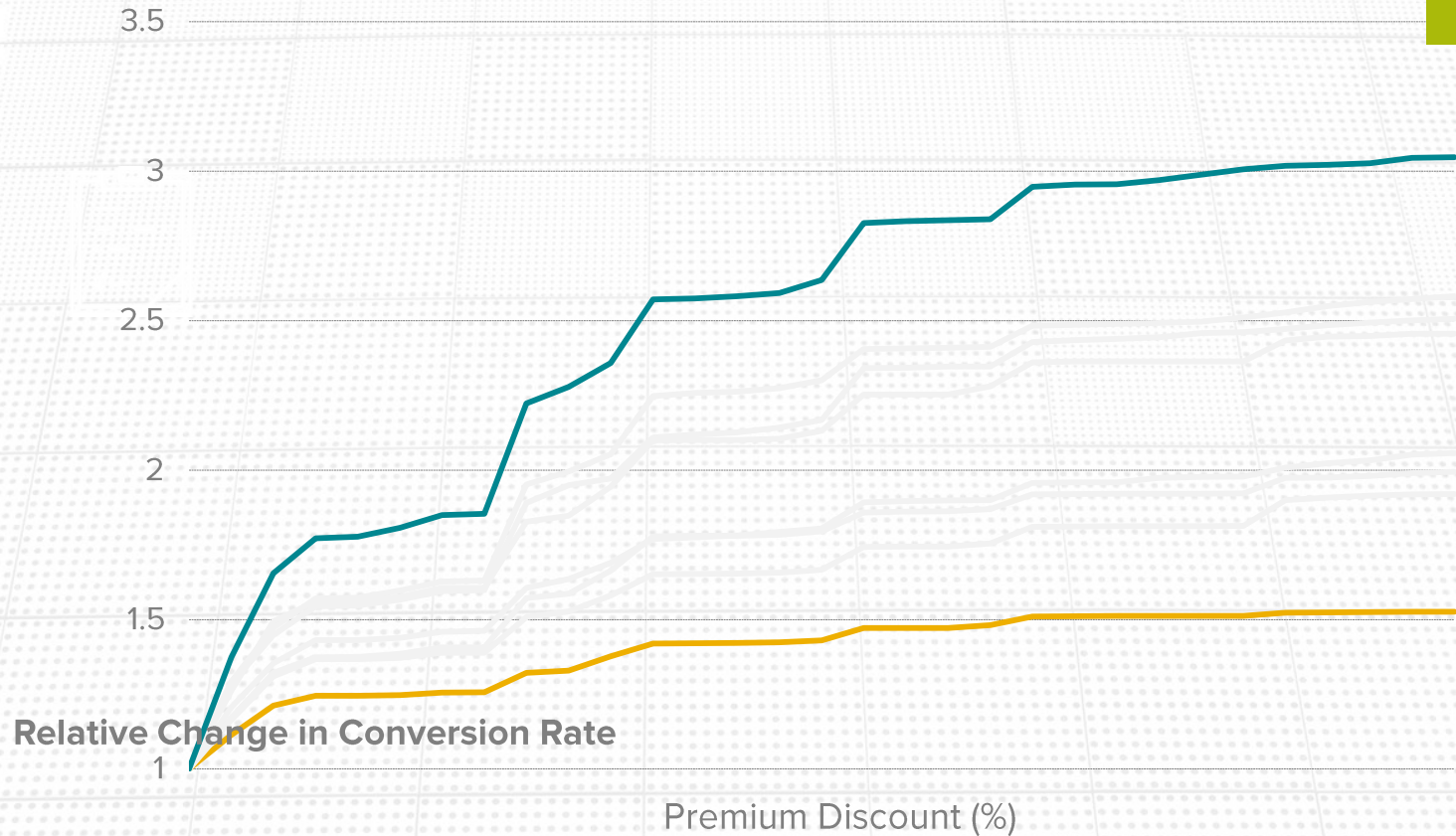
Applications in Commercial Lines



Some current applications



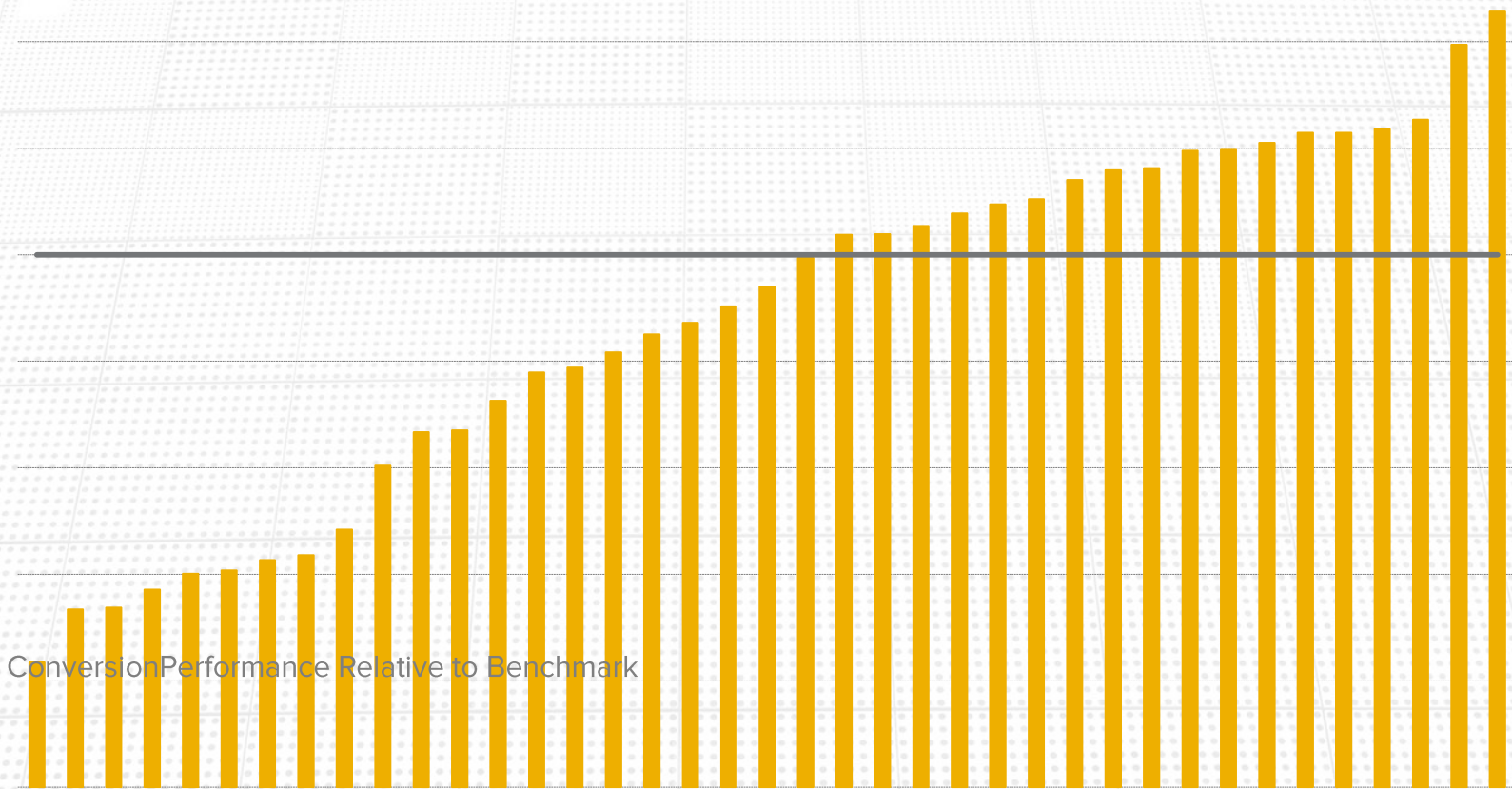
Quote
Conversion



Some current applications



Quote
Conversion



Some current applications



Quote
Conversion



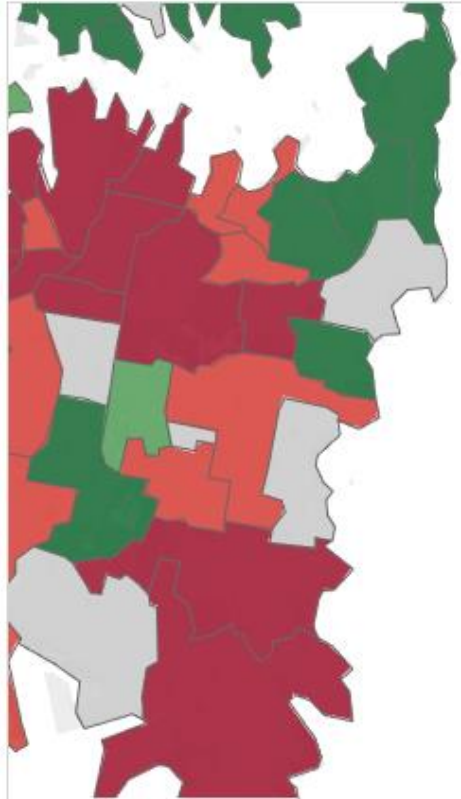
Theft Rating

Some current applications



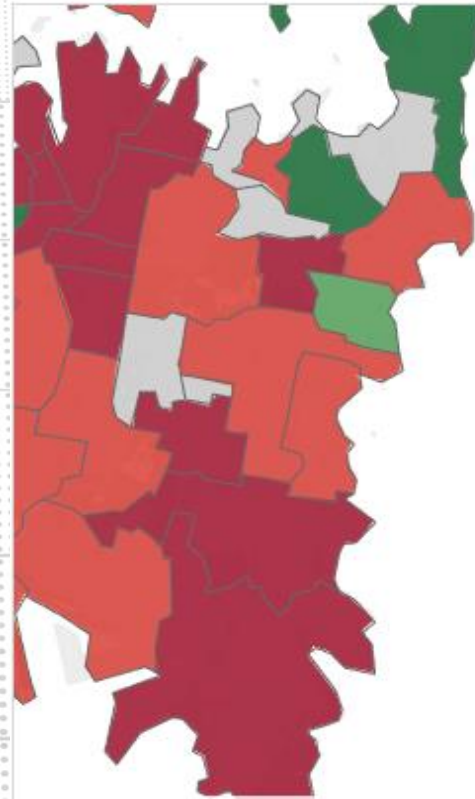
Theft
Rating

Raw Theft Frequency



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Predicted Theft Zones

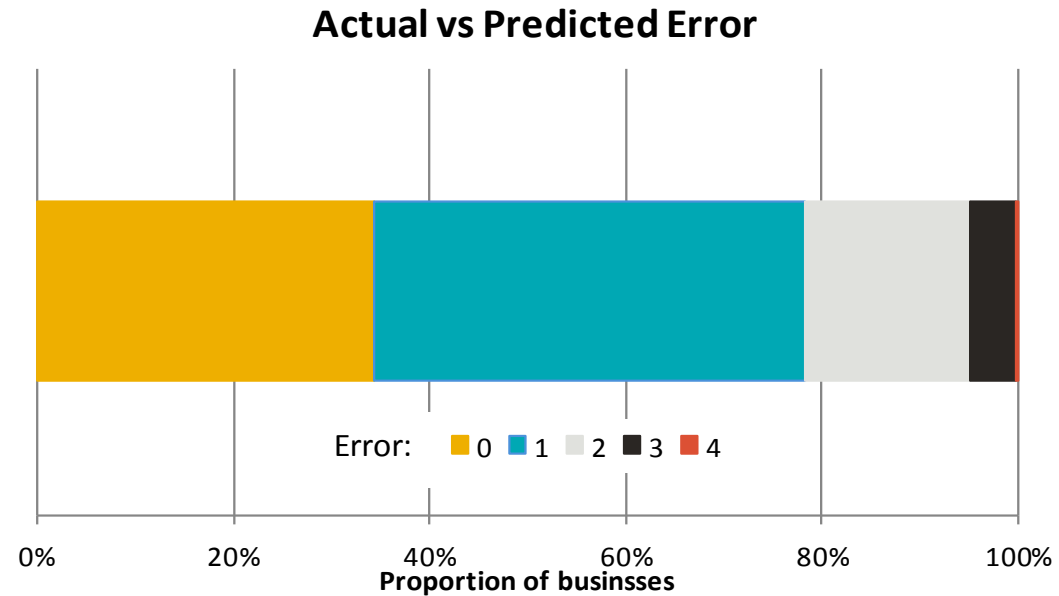
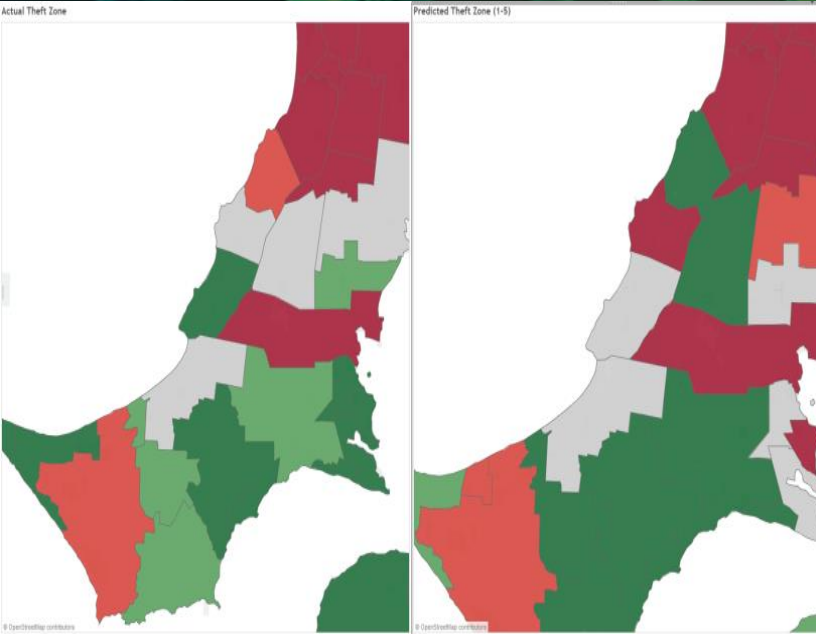


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Some current applications



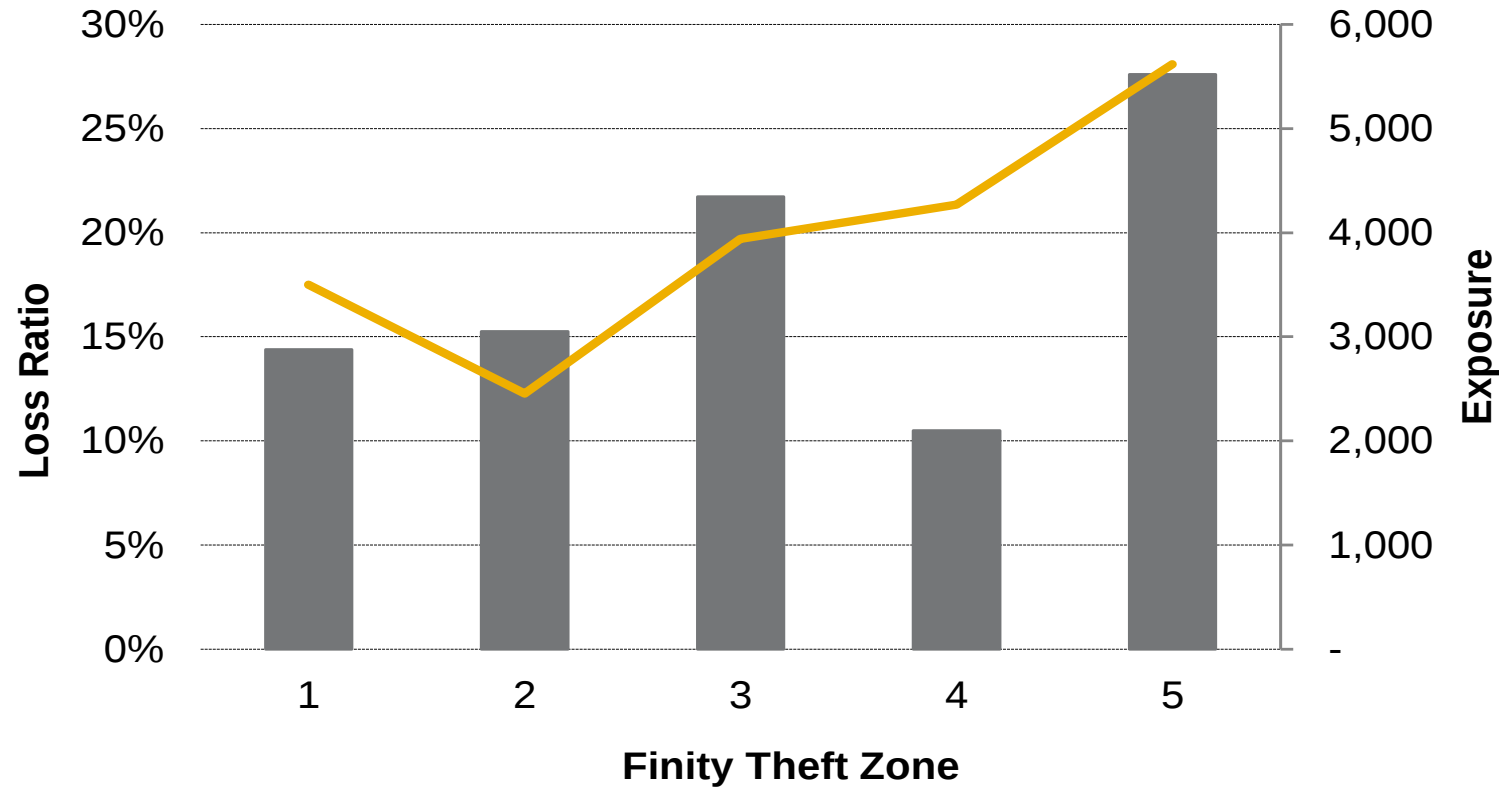
Theft
Rating



Some current applications



Theft
Rating



Some current applications



**Quote
Conversion**



Theft Rating



Storm



**Tech Pricing
Enhancements**

Potential Applications



**Rate
Adequacy**



**Broker
Performance**