Interpretable AI

TURN DATA INTO TRUSTED ACTION

State-of-the-art analytics solutions that are not black boxes

Founder Team

Prof. Dimitris Bertsimas, Partner

30+ years of experience

Codirector at the MIT ORC

Serial entrepreneur

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PhD from MIT

Software engineering @ Google

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PhD from MIT

7+ years consulting

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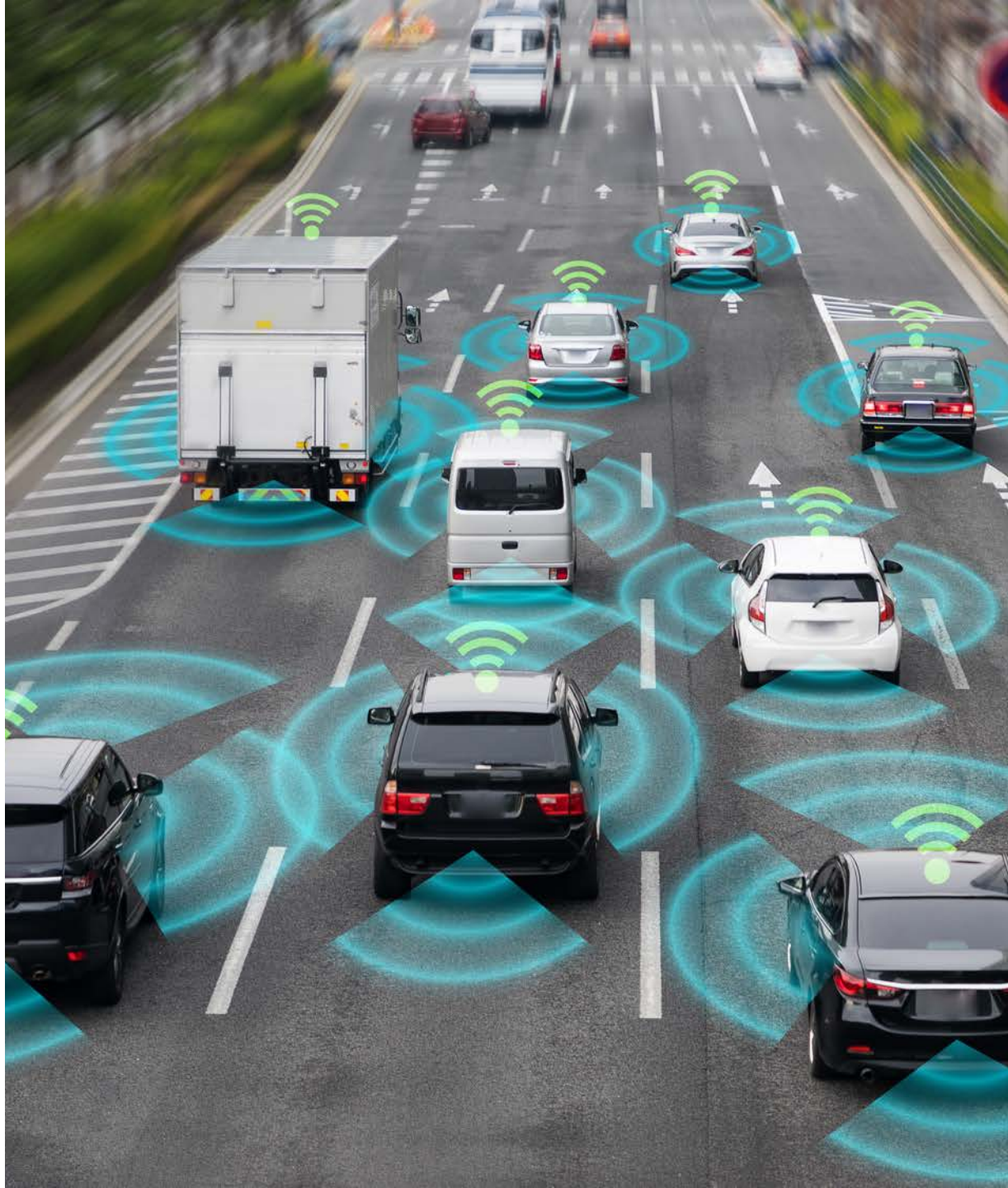
A driverless car is involved in an accident with loss of life.

- Who is at fault?
- Can society tolerate not understanding?

GDPR requires a “right to explanation”: algorithms must be accountable



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*"We want to **understand how the decision is made**, so that we can stand behind it and say that we're not disfavoring someone."*

Interpretability matters

*"The **interpretability** of the model results, **having confidence** that the model is performing accurately, will be a key component."*

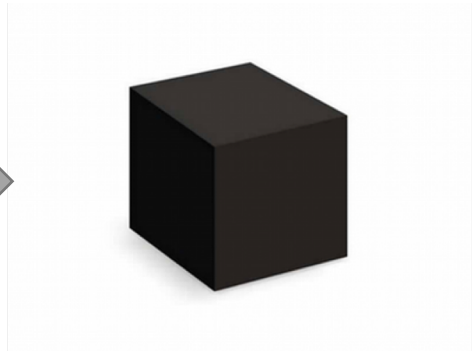
*"Two-thirds of businesses are reluctant to proceed with AI, with **lack of explainability ranking as the largest roadblock**."*

Interpretable models make predictions based on understandable rules

Black-box models

Patient info

Age:	30
Gender:	male
Albumin:	2.8g/dL
Sepsis:	none
INR:	1.1
Diabetic:	yes
…	



Mortality risk: 26%

Interpretable models

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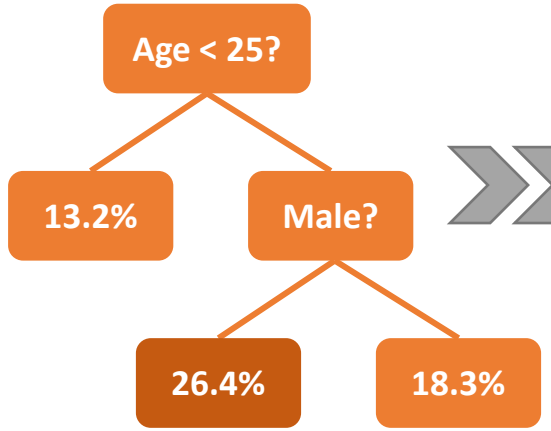

Mortality risk: 26%

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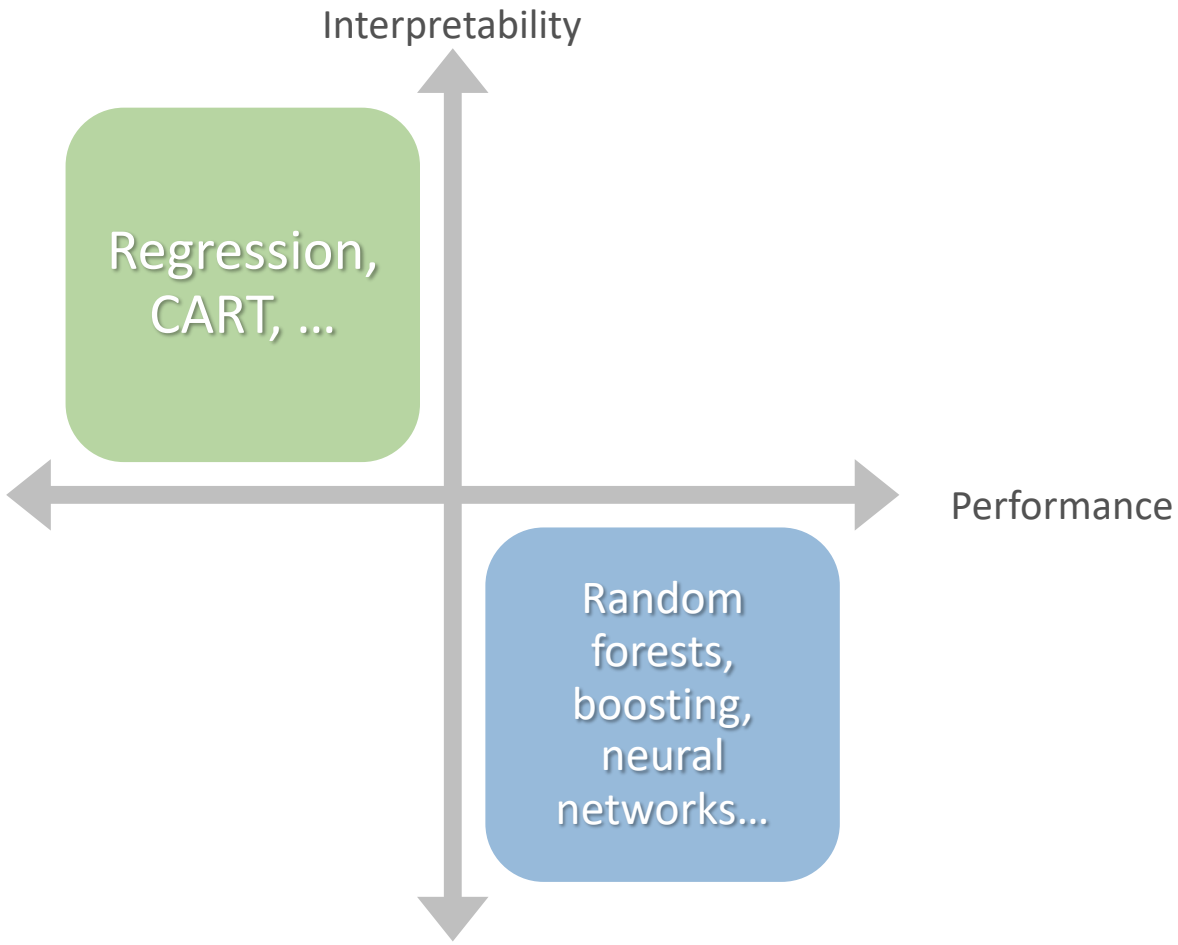
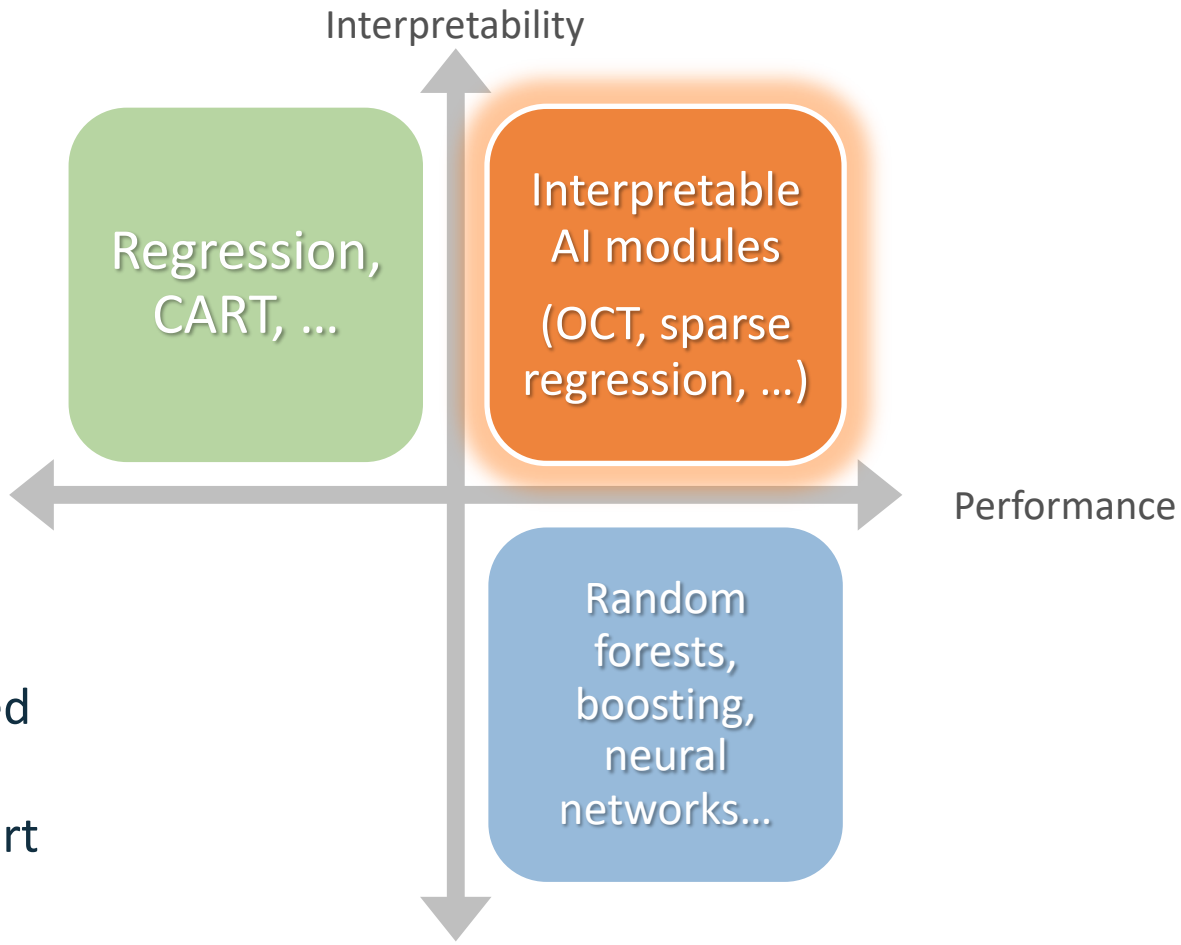
Existing methods achieve performance *or* interpretability - not both



Our proprietary software modules deliver performance and interpretability simultaneously



*Benchmark studies published in top journals show the IAI methods reach state-of-the-art performance

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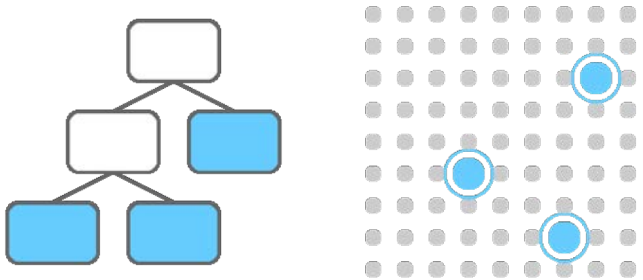
Our interpretable solutions produce performance gains at each step of the analytics lifecycle

Data cleaning

Optimal Impute

Automatic data QA

Predictive tasks



Optimal Decision Trees

Holistic Regression

Prescriptive decision making

Optimal Prescriptive Trees

Optimal Data-Driven Prescription

Each module based on years of MIT research

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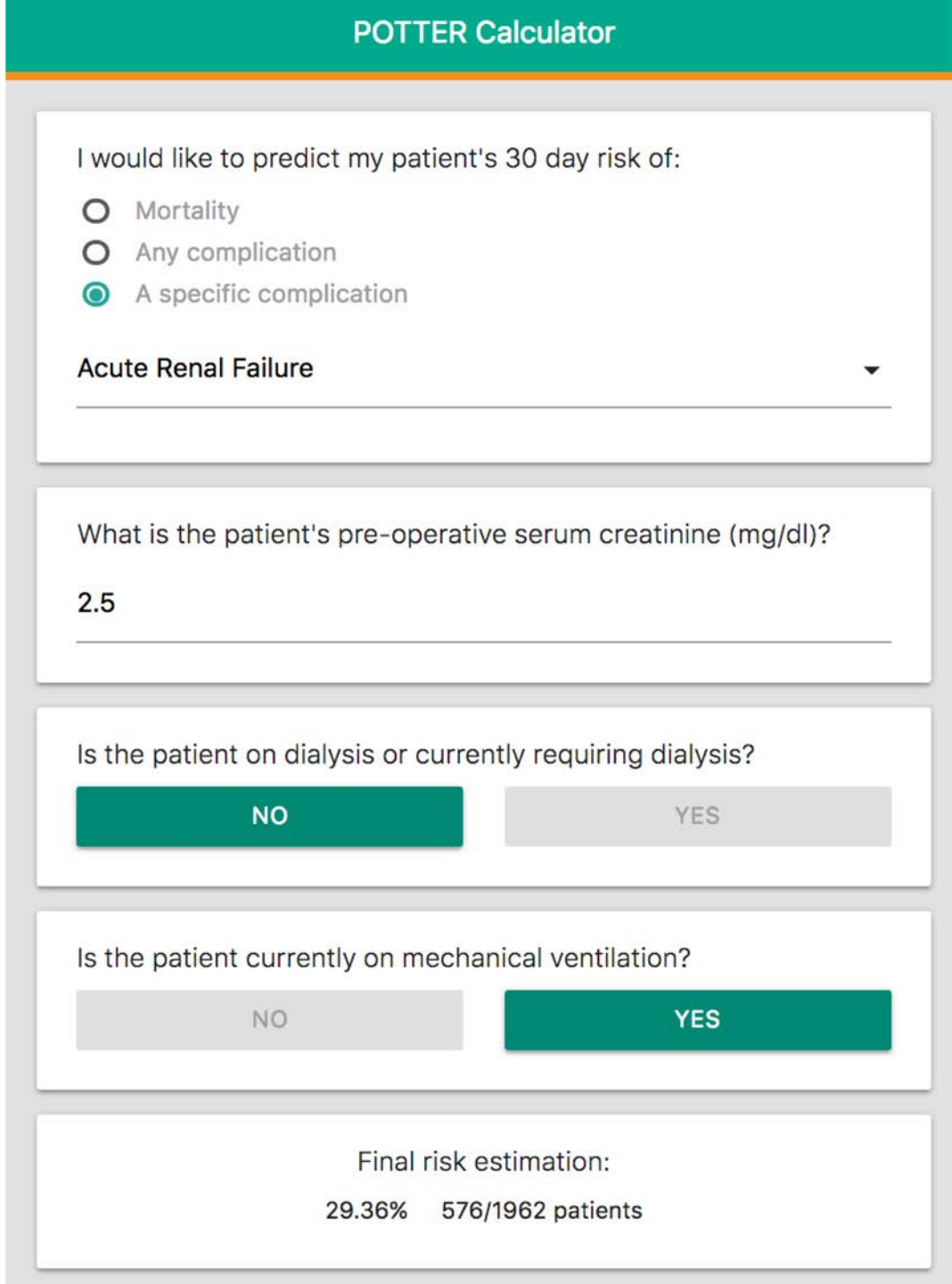
Surgical Risk Calculator

Current prediction models in medicine are often built with logistic regression

- limited accuracy
- many variables and hard to use

We collaborated with MGH top surgeons to build a surgical risk calculator

- Used for training and daily rounds at MGH
- 500+ users



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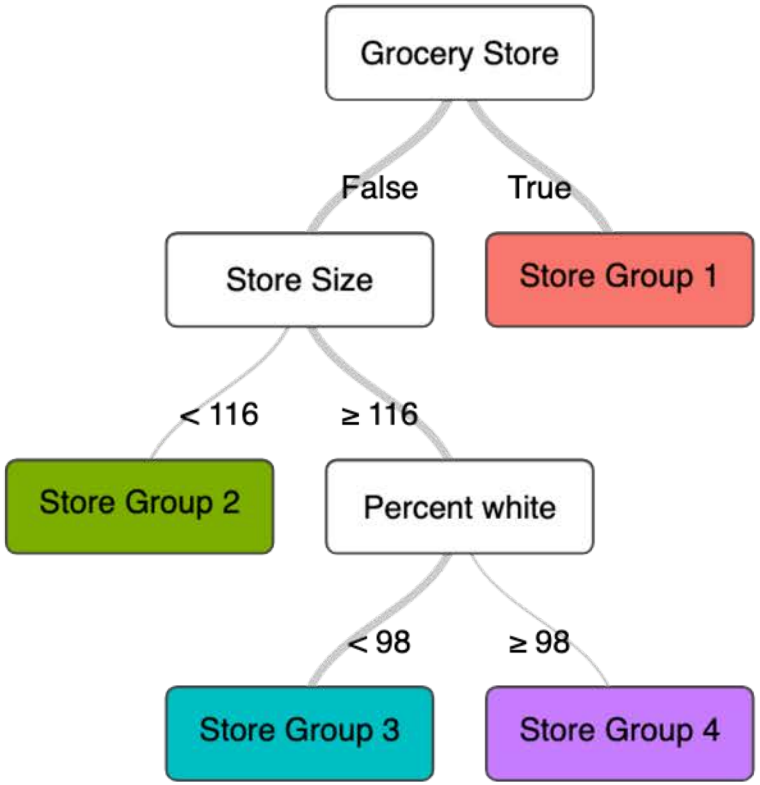
Assortment planning for global retailers



- Step 1: Use *Optimal Trees* to automatically segment stores to account for customer-base heterogeneity
- Step 2: Optimize the best mix of products for each store group to maximize revenue
- Estimated revenue gain of 15%

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Automated data quality pipeline for insurance

- Claims data are erroneous
- The analytics are very sensitive to poor data
- Build a pipeline with *Optimal Imputation* to systematically improve quality of data
- Catches and corrects 90% of data errors

- Outliers
- Raw data errors
- Import errors

- Correct outliers
- Impute missing data

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Current Customers

Real-time malware detection for **cybersecurity**

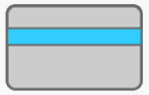
Quality control for **automotive manufacturing**

Personalized product recommendation for **retail banking**

Assortment planning with many global **retail** partners

Surgical risk calculator at **major hospitals**

Marketing strategy for **investment fund managers**



Risk scoring for **banking** and **insurance**

Exceptional responders for major **pharmaceuticals**

Automated data quality pipeline for **insurance**

Looking for additional partners to build and improve the trust in their data-driven decision making

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