PETFOOD FORUM

Where the GLOBAL PET FOOD INDUSTRY does business

#petfoodforum

CAMBRIDGE X **petTech**®
A Cambridge Technology Company

Transformative potential for AI in pet food innovation, sales creation, and sustainability

April 28-30, 2025, Kansas City, Missouri, USA

Topics

About Cambridge Technology

What is AI, and why should pet businesses care

Ways AI can be applied to

Innovation & Product development

Research & Testing processes

Manufacturing & Supply Optimization

Where to start

Considerations & Next Steps

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About Me

- **Cambridge Technology, Chief Scientist**

- **Background in Big Data, Machine Learning / AI, and quantitative finance and economics. PHD in Physics at Stanford University**

- **Experience:**

    Ø Director of Research of Higher Moment Capital, developing and executing quantitative investment strategies in the systematic global macro space and in volatility arbitrage.

    Ø Senior Research Scientist at Hewlett-Packard Labs and Xerox Palo Alto Research Center (PARC), working in data mining and personalization, distributed systems, privacy, and information economics

- **Other research interests included social media modeling, behavioral economics, and complex network theory.**

Overview

CAMBRIDGE TECHNOLOGY
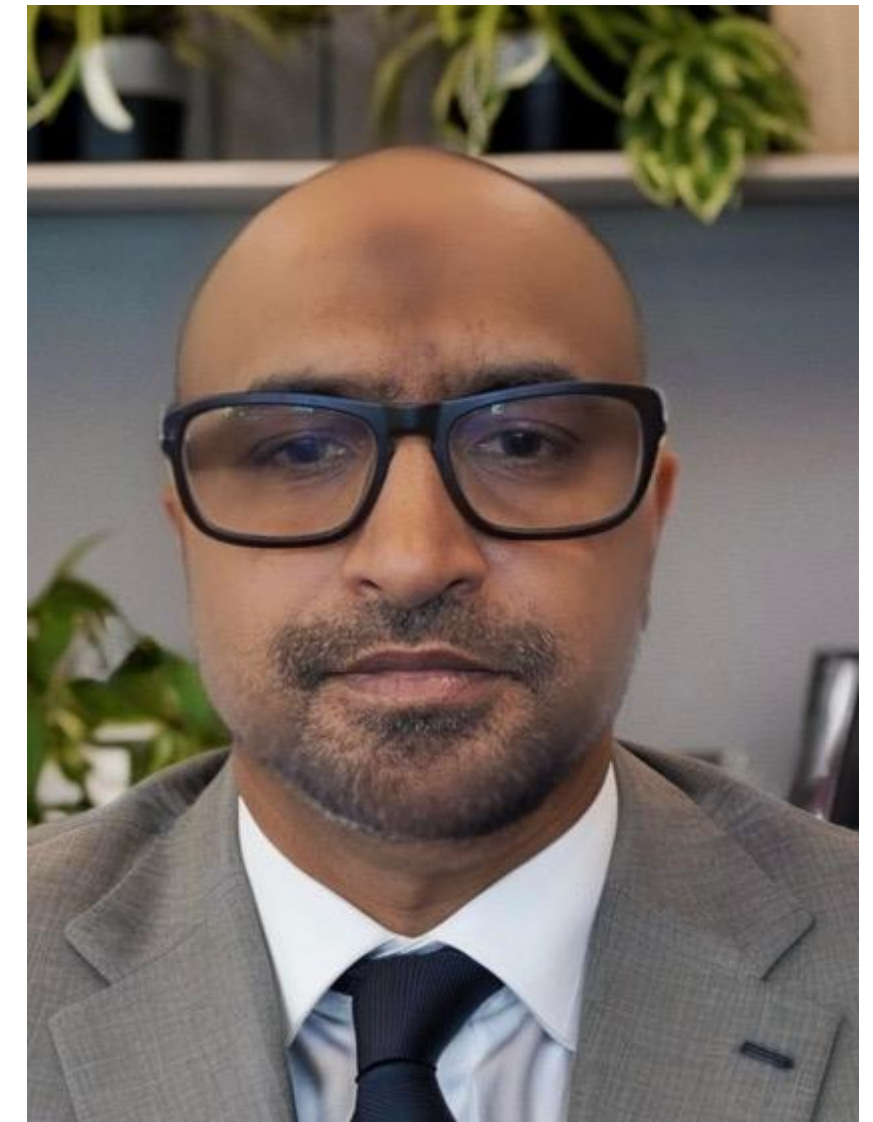
A global thought leader and technology partner to industry-leading organizations delivering tailored AI, data, & analytic solutions across industry verticals

CAMBRIDGE petTech®
A Cambridge Technology Company

A dedicated team with 20+ years of Pet and Animal Health focused AI, Data, and Analytics expertise providing custom solutions that drive innovation, optimize operations, reduce costs, and build scale.

650+ Employees

1000+ Projects

	North America	Europe	Asia Pacific
Partners	salesforce, aws, tableau	Google Partner	CONFLUENT, ORACLE
Customers	IRON MOUNTAIN®, PORSCHE, BOSCH	BlueCross BlueShield	Schneider Electric, Point32Health

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Mission

Understanding & unlocking the untapped potential within pet businesses

As a leading technology provider and a proud member of the APPA, our goal is to **facilitate innovation** and to **enhance animal health wellness** through our broad industry, technology, and solutions expertise
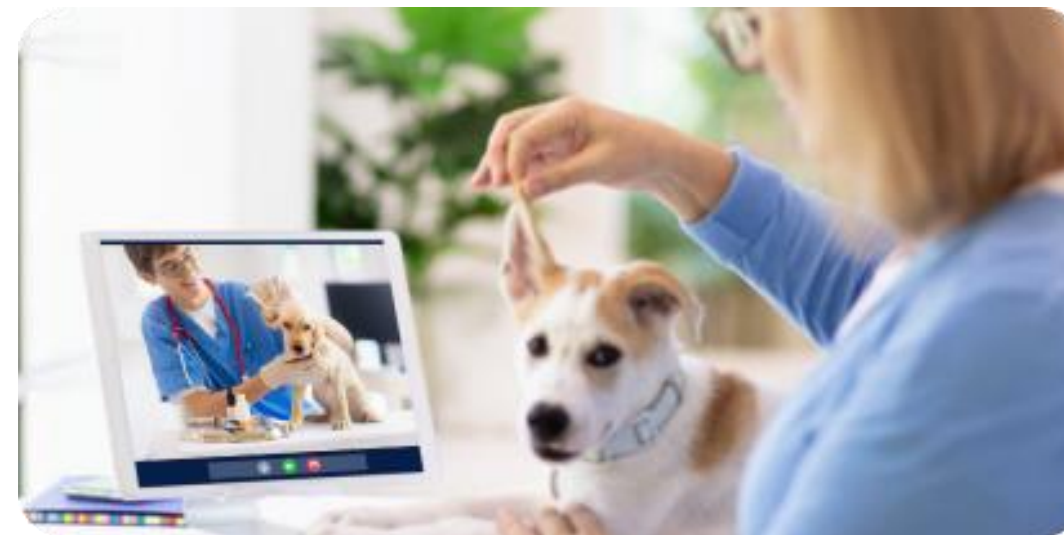

Pet Brands

(Consumer Brands, Manufacturers, & Co-Manufacturers)

Retailers & Distributors

(Brick & Mortar, E-Comm, Direct-to-Consumer)

Veterinary Services

(Clinics & Hospitals, Insurance, Training & Wellness)

Research & Testing

(Clinical Research, Formulation, Behaviour/Mobility)

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Technology solutions toolbox

AI & Machine Learning

Operationalized AI

SaaS Solutions & Custom Apps

Business Intelligence & Analytics

Cloud Migration & Transformation

Enterprise Mobility

Managed Services

BPO/KPO

IoT Services

Cybersecurity

Data Analytics & Engineering

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ARTIFICIAL INTELLIGENCE –
WHAT YOU SHOULD KNOW

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What is AI

A set of technologies that enable computers to perform a variety of advanced functions:

ability to **see, understand and translate spoken** and written language,
-analyze **data**
-make **recommendations**
-more...

Why should pet businesses care about AI

Across other industries

- early adopters of Generative AI stave off disruption
- by embracing it themselves enhance their competitive strength

AI is a core transformation

- like the internet itself
- it affects everything

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Generative AI is a technology that surprised even the researchers who created it

we don't even understand why it works

-"alien intelligence" landed in the laps of researchers... still trying to understand how it works ... but it definitely works ... and it will only get better

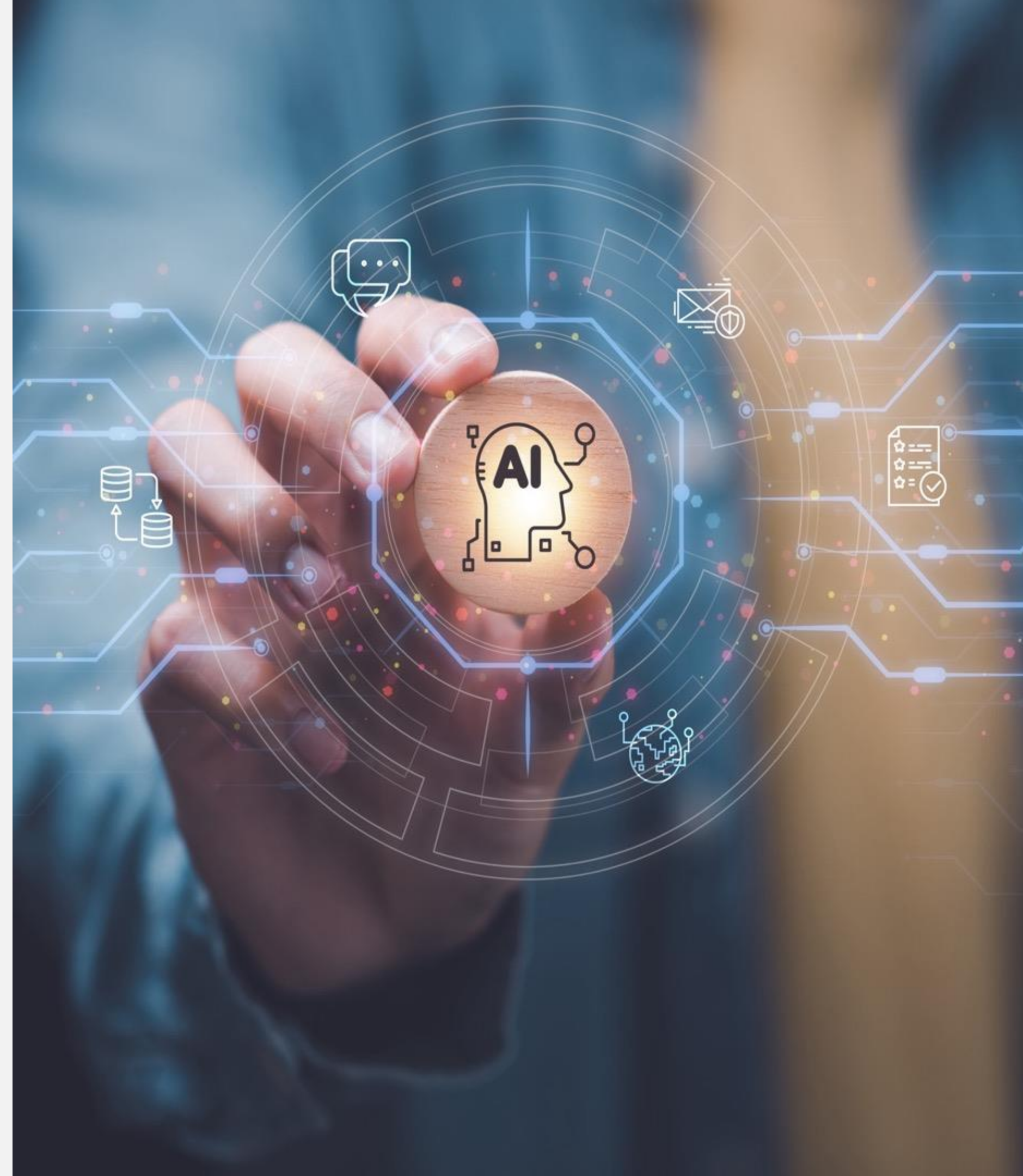AI is more of a scientific discovery, than an invention

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Our belief…
AI is that it is NOT the kind of technology that produces a few new winners (only) (e.g. Google)

this revolution will affect every single industry and business over time

powerful incumbents may actually benefit rather than be threatened

If they embrace this future!

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We are at the Beginning:
Almost everything we do going forward will be impacted by AI

Automated scientific research mathematical theorem proving to drug discovery

New forms of visual arts & music

New assistive technology capabilities

New forms of education – AI tutoring

Automated content generation and sentiment analysis

Truly capable autonomous intelligent agents working on your behalf

AI
IS ALREADY IMPACTING THE PET INDUSTRY.

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AI benefits span across pet roles

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Research & Testing

- Health testing & monitoring
- Ai-enabled Lab management
- Veterinary diagnostic
- Animal behavior & welfare

Innovation & Product Development

- Identifying white space
- Formulation & palatability
- Personalized products
- Accelerated concept testing

Manufacturing & Supply Chain Optimization

- Efficient sourcing
- Regulatory & compliance
- Process optimization
- AI-enabled predictive planning

AI-Powered Veterinary & Pet Health Analytics

AI identifies early health risk indicators, using predictive diagnostics to improve pet wellness.

Revenue Generation

- Personalized product recommendations
- Channel & pricing optimization
- AI-enabled chatbots
- Predictive forecasting

+ **Training & compliance**

+ **Human Resources**

+ **Finance**

+ **Sales enablement**

Innovation

AI is an Enabler of Visionary Thinking

- simulating, predicting, and enhancing ideas beyond traditional R&D
- Removing the limitations of immediate market demands, existing technologies, or current capabilities.

AI helps blue-sky innovation by

Automating complex problem-solving at scale	**Accelerating hypothesis testing with AI-driven simulations**
Identifying hidden patterns in data for disruptive innovation	**Reducing costs & time-to-market for bold, untested ideas**

AI Predictions of Pet Food Palatability Tests

Predicting the outcome of palatability tests

- A well-defined problem with clear outcome and data
- A time ordered sequence of experiments over a long period of time
- Can do "backtest" so that no "peeking into the future" outcomes of tests is allowed

Outcome variable are well coded

- One of {Win, Loss, Parity} between Test and Control Diet
- Classification problem
- Intake ratio can also be used and an outcome variable for a
- scalar prediction
- Nonlinear Regression / Scalar Prediction problem

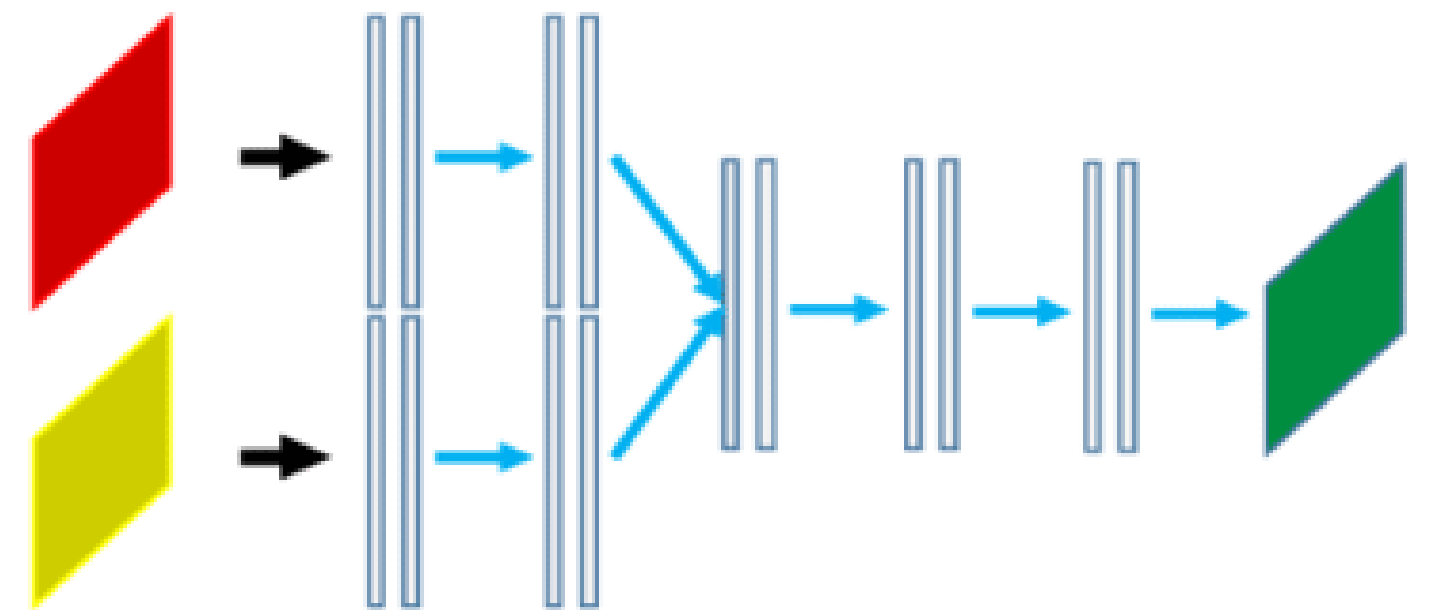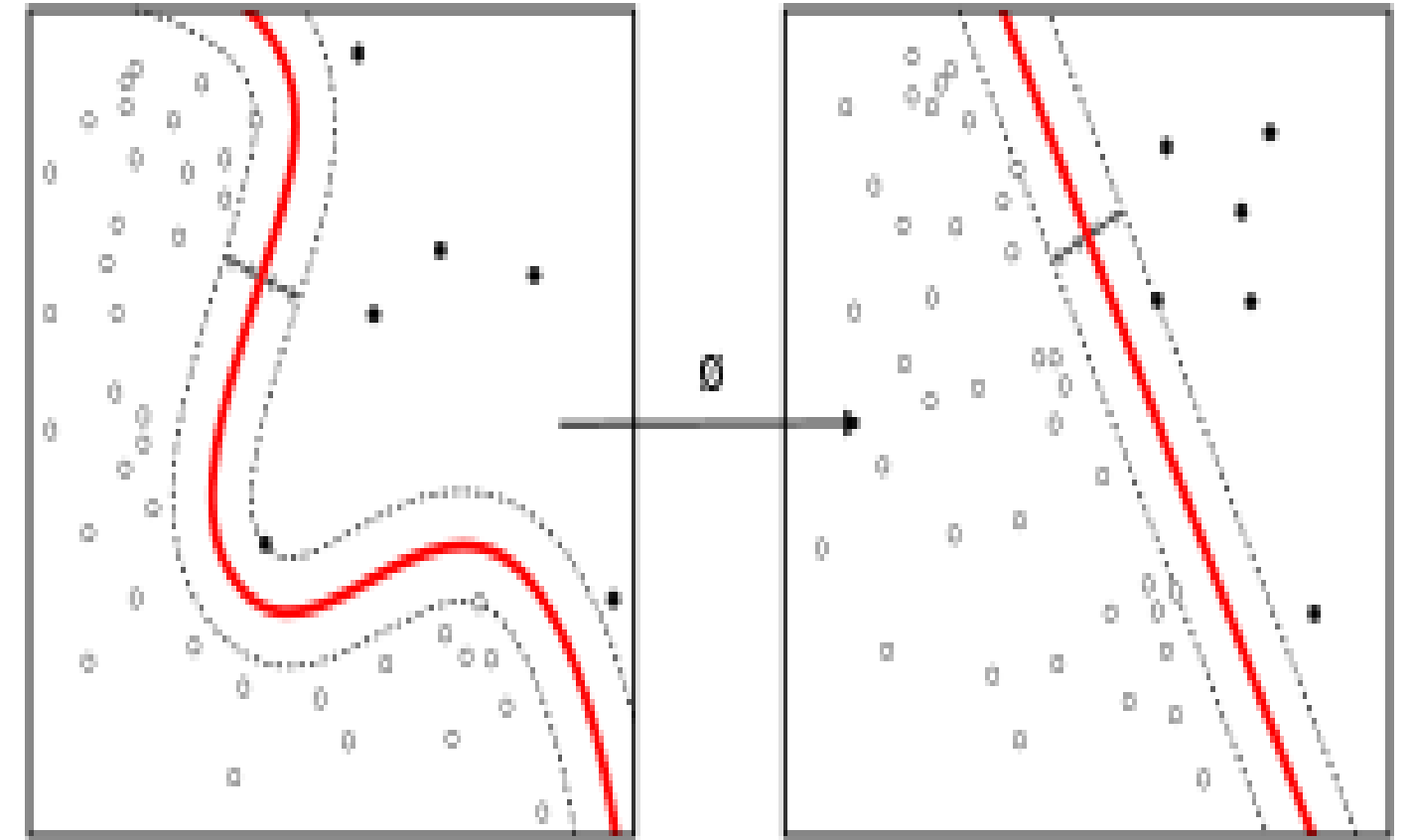# AI Predictions of Pet Food Palatability Tests

What would you do if you only had data in which users were given two movies and they told you only which ones they liked better?

Familiar with Netflix–type problems

- Movies and user ratings on a scale of 1–5 ("palatability"?) for example
- Predict ratings on unseen movies for a user
  - Classic "collaborative filtering" problem that was the famous Netflix Prize

Related also to web search ranking

- Show top k most "relevant" ("most tasty") documents to a user's query
- Web search ranking is an entire specialized sub-field of Machine Learning

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AI Predictions of Pet Food Palatability Tests

Good accuracy

Simple metric accuracy

> 70%

Model can provide "degree of confidence"

- Decide which tests are "borderline" and worth doing
- Can make suggestions for high confidence tests that have not been done yet....

Confusion Matrix

	Actual Loss	Actual Win
pred loss	1306	435
pred win	633	1504
pred loss	75.0%	25.0%
pred win	29.6%	70.4%
accuracy	**72.5%**	

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Generative AI Computer Vision: Pet Food QC

Manufacturing PRODUCT Quality Control

AI Computer Vision has been used to automatically check quality characteristics of components/ingredients

- Fat content, freshness
- Color
- Piece sizes, mix proportions

  - foundation models reduce the need for training from scratch, lowering cost
  - production line integration enables real-time monitoring and removal of low-quality or non-compliant components
  - product quality and consistency is ensured in an efficient, low-cost way

Generative AI Computer Vision: Pet Food QC

PACKAGING Quality Control

AI Computer Vision AI can inspect the quality of packaging and other characteristics

- Accuracy of labels
- Placement of labels
- Closure defects

  - algorithms can enable real-time detection of issues
  - foundation models reduce the need for training from scratch, lowering cost
  - automation reduces errors and enhances overall product safety, while reducing TCO

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AI Enabled Predictive Maintenance

Predictive Maintenance Systems Give Early Warnings

Build AI models of what is "normal" help identify anomalies

- Realtime data from various kinds of sensors can be used to make predictions of failures, inefficient operation, etc.
  - Temperature sensors measure variation
  - Vibration sensors in heavy equipment like mixers, etc.
  - Energy consumption changes

- Foundation models can sometimes allow for "one-shotting" such problems
  - Make finetuning & training from scratch cheaper

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AI Enabled Sales Creation & Sustainability Tracking

Hyper-personalized sales & marketing strategies increase interest, grow conversion, and build loyalty

- The right product, to the right person, at the right price, at the right moment.

Optimized sustainability & compliance monitoring through the power of AI

- Data and regulatory complexities are streamlined, emission & waste reduced, and materials optimized through next-gen AI models

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Where to start

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AI is Full of Possibility— Align to Your Business Needs

- The potential of AI is vast, but success depends on aligning it to your unique challenges & goals

- There's no one-size-fits-all solution—your business deserves a tailored approach

Start Small, Aim High

- Begin with your most pressing pain points or biggest opportunities

- Use a crawl–walk–run strategy to scale with confidence

- Solve for 'now', but with an eye on the future

Pick the 'Right' Technology Partner

- Established & credentialed with applicable expertise & experience

- Full-stack expertise—from strategy & data readiness to deployment & integration

- Collaborative with a sense of urgency & an ability to scale

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Q & A

Want to Learn More?

Visit Us at Booth

Visit Us @ Booth #733

Want to contact via email

sales@cambridgepettech.com

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THANK YOU

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