

# Trendthema KI: InterSystems Tools und Best Practices



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# KI demystifiziert



## Artificial Intelligence

### Machine Learning

Image Recognition

Survival Analysis

...

### Tabular ML

Classification

Regression

Clustering

...

# Machine Learning Problemtypen



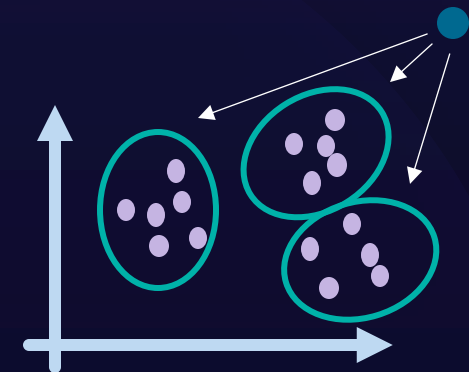
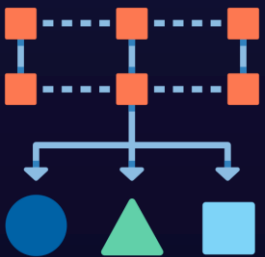
**Supervised learning  
(labeled Data)**

**Unsupervised learning  
(unlabeled data)**

**Classification**

**Regression**

**Clustering**



# KI demystifiziert



## Artificial Intelligence

### Machine Learning

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Survival Analysis

...

### Tabular ML

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...

### Deep Learning

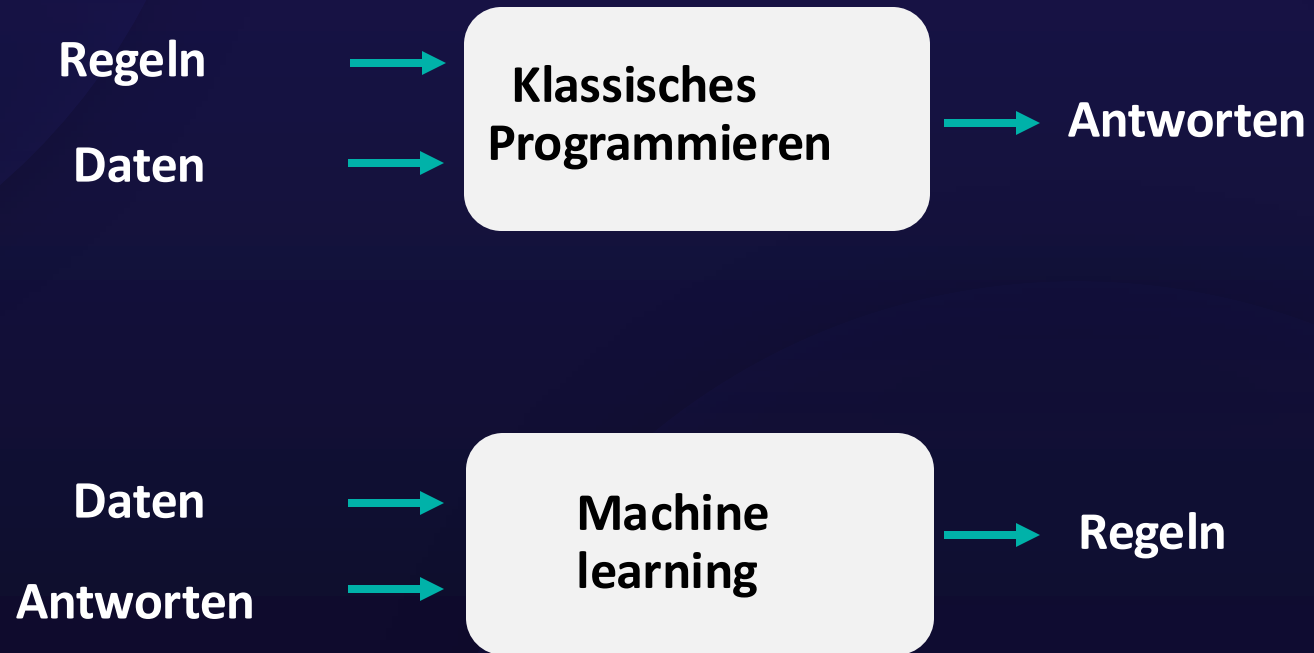
#### Generative AI

Large Language Models

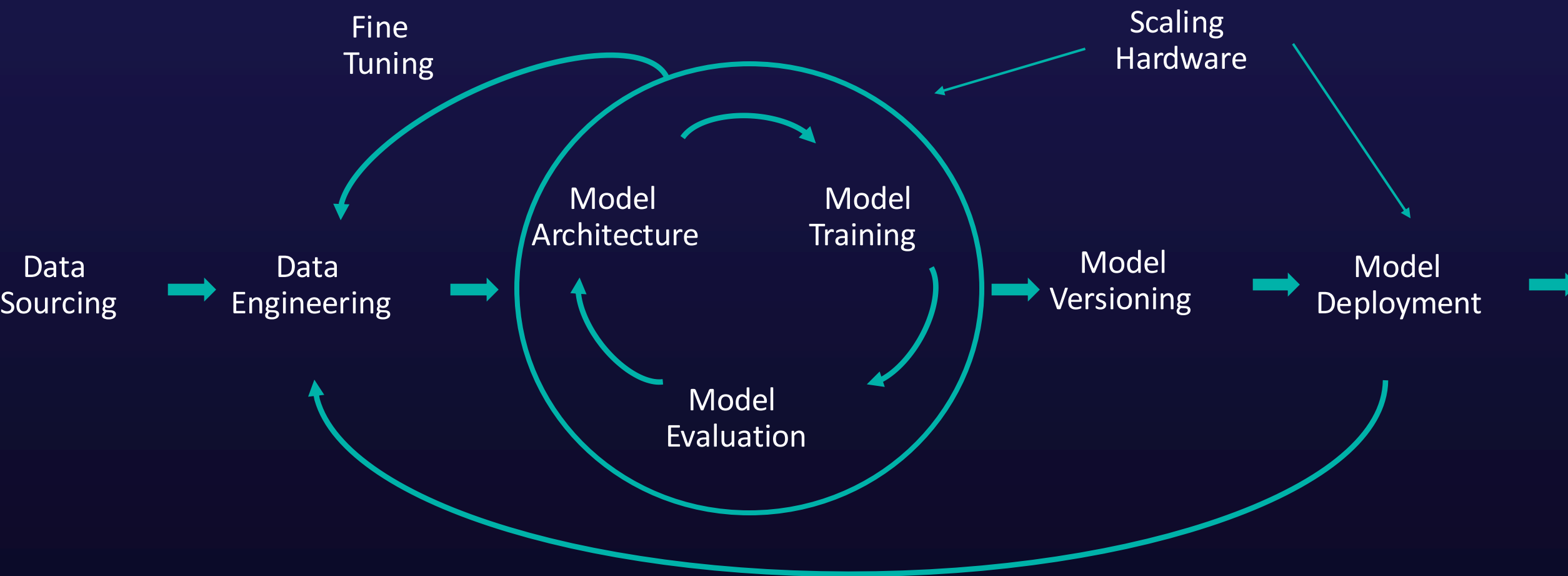
Vector Search

...

# Unterschied zum Programmieren



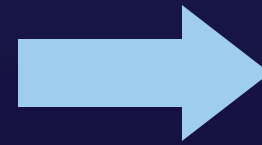
# ML Cycle



# InterSystems IntegratedML, das SQL-Interface

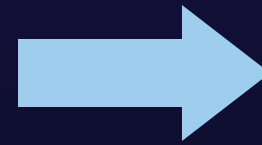


```
CREATE MODEL <model name>  
PREDICTING(<label>)  
FROM <TRAINING.table/view>
```



ML Model  
Definition

```
CREATE TIME SERIES MODEL  
<model name>  
PREDICTING(*) BY (date)  
FROM <TRAINING.table/view>
```



Trained  
TimeSeries Model



# TIME SERIES MODEL



# InterSystem IntegratedML, the SQL-Interface



```
CREATE MODEL <model name>  
PREDICTING(<label>)  
FROM <TRAINING.table/view>
```



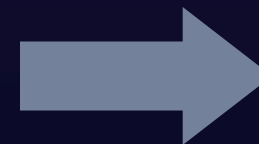
ML Model  
Definition

```
CREATE TIME SERIES MODEL  
<model name>  
PREDICTING(*) BY (date)  
FROM <TRAINING.table/view>
```



Trained  
TimeSeries Model

```
TRAIN MODEL <model name>
```



Trained  
ML Model

# AutoML, Ein Blick ins Innere



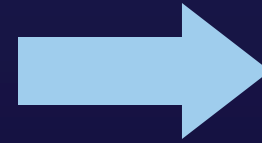
```
TRAIN MODEL <model name>
```

- ML Modell mit nur 4 SQL Befehlen
  - Wendet ML direkt auf den Daten an
  - Sehr einfach ML in eine Anwendung zu bringen
- 
- Feature Transformation (leere Felder, one-hot, ...)
  - Versucht verschiedene Modelltypen(boost trees, logistic reg,...)
  - Zusammenstellung der qualitativen Modellen zu einem

# Anwendung von IntegratedML

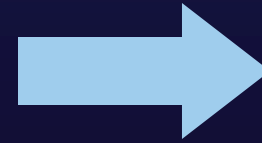


```
VALIDATE MODEL(<model name>)  
FROM <TESTING.table/view>
```



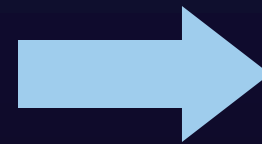
ML Model  
Definition

```
SELECT PROBABILITY(<model>)  
FROM <table/view/record>
```



Calculate  
Probabilities

```
SELECT PREDICT(<model>)  
FROM <table/view/record>
```



Predicted  
Result

# VectorSearch mit Intersystem IRIS



TechCrunch

<https://techcrunch.com> › 2023/04/27 › pinecone-drop... ⋮

## Pinecone drops \$100M investment on \$750M valuation, as ...

Apr 27, 2023 — The **company** has now raised \$138 million including a \$28 million Series A last year and a \$10 million seed investment in 2021.



MongoDB

<https://www.mongodb.com> › blog › post › introduc... ⋮

nt ...  
g new **Vector Search**

ITWire · 3 Std.

## InterSystems expands the InterSystems Iris data platform with Vector Search to support next-generation AI applications

This is why we're excited to announce the addition of vector search to the InterSystems Iris data platform. Tools like vector ...



ChromaDB

<https://www.trychroma.com>

## Chroma raises \$18M

Apr 6, 2023 — Chroma has raised \$18 million in funding. Joining the round are angels in



PR Newswire

<https://www.prnewswire.com> › news-releases › weavia... ⋮

## Weaviate Raises \$50 Million Series B Funding to Meet ...

Apr 21, 2023 — The company was founded in 2019 and is funded by Index Ventures, Battery Ventures, NEA, Cortical Ventures, Zetta Venture Partners, and ING ...



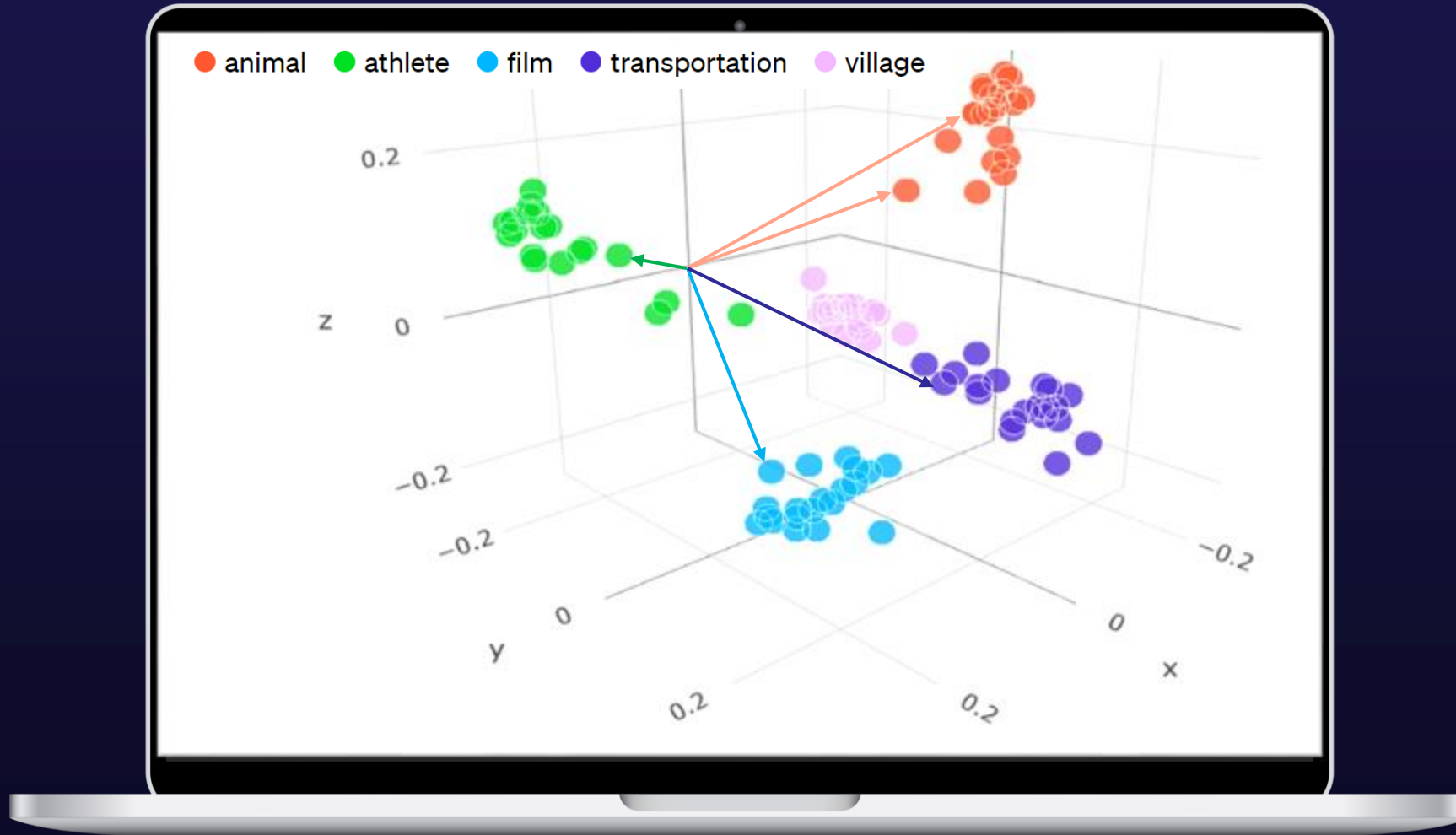
<https://siliconangle.com> › 2023/08/15 › redis-adds-sup... ⋮

## Redis adds support for vector database search in its first ...

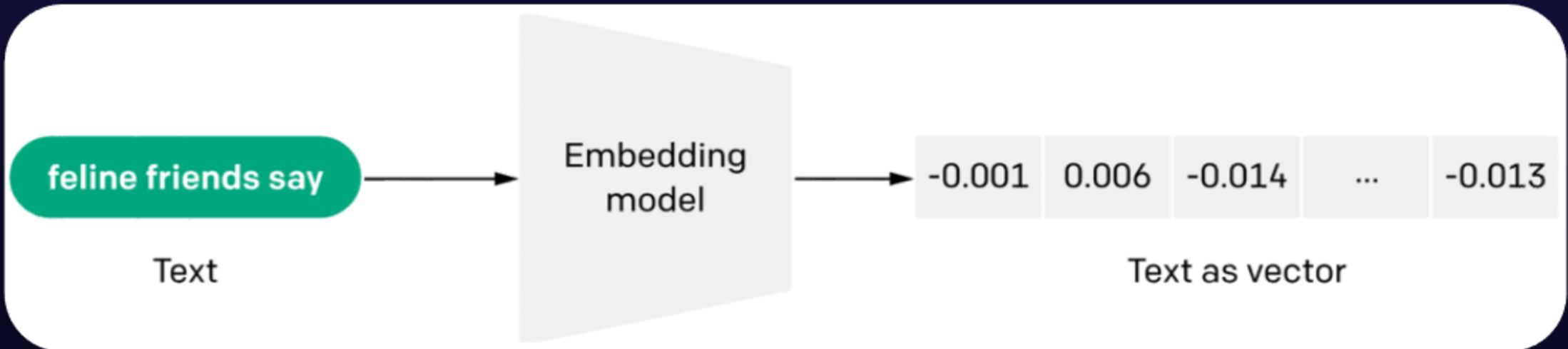
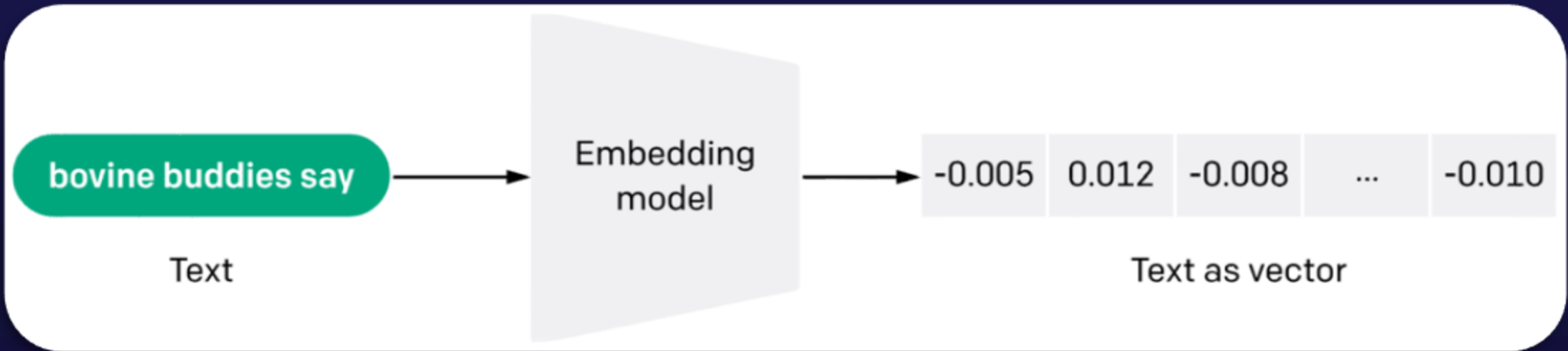
Aug 15, 2023 — **Database** management startup **Redis** Inc. has added tons of new functionality to its platform, including **vector** search capabilities, ...



# Sätze & Kontext als Vektoren



# Word embeddings



# InterSystems IRIS Vector Search



- new VECTOR datatype & similarity functions

```
CREATE TABLE t (txt VARCHAR(1000), vec VECTOR(INT, 200));
```

```
INSERT INTO t VALUES ('...', TO_VECTOR('1,2,3,...', INT));
```

```
SELECT TOP 10 * FROM  
FROM ( SELECT t.*, VECTOR_DOT_PRODUCT(vec, TO_VECTOR(...)) AS similarity FROM t )  
ORDER BY similarity DESC;
```

- Similarity search is cornerstone of RAG
  - Also useful outside of Generative AI

# Fazit



ML ist ein leistungsstarker Ansatz, um Anwendungen intelligenter zu machen. InterSystems macht es sehr einfach, die ML-Welten mit den Anwendungs- und Datenwelten zu verbinden.

**Wir „bringen ML zu den Daten“.**



# Thank You!

Let's connect...



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