TAMK - Tekoäly ja automaatio

Silo AI

photorealistic image of an finnish AI 44 years old consultant giving keynote about AI at Jyväskylä --v 6.0

Midjourney

18 months

Who we are

Europe's largest private AI lab

SILO AI

What we do

Trusted AI partner. We build AI-driven products by providing world-class AI models, tools and services.

Our vision

AI for people. A world with safe human-centric AI that frees the human mind for meaningful work.

330+ experts

150+ PhDs

200+ production-grade AI

ML | CV | NLP | LLM

Cloud | IoT | Embedded

Nordics
Finland, Sweden, Denmark

North America
United States
Canada

Europe
The Netherlands
Germany

/A.I. TIMELINE

1950
TURING TEST
Computer scientist Alan Turing proposes a test for machine intelligence. If a machine can trick humans into thinking it is human, then it has intelligence

1955
A.I. BORN
Term 'artificial intelligence' is coined by computer scientist, John McCarthy to describe "the science and engineering of making intelligent machines"

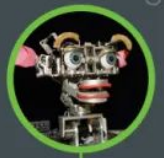
1961
UNIMATE
First industrial robot, Unimate, goes to work at GM replacing humans on the assembly line

1964
ELIZA
Pioneering chatbot developed by Joseph Weizenbaum at MIT holds conversations with humans

1966
SHAKEY
The 'first electronic person' from Stanford, Shakey is a general-purpose mobile robot that reasons about its own actions

A.I. WINTER
Many false starts and dead-ends leave A.I. out in the cold

1997
DEEP BLUE
Deep Blue, a chess-playing computer from IBM defeats world chess champion Garry Kasparov



1998
KISMET
Cynthia Breazeal at MIT introduces KISmet, an emotionally intelligent robot insofar as it detects and responds to people's feelings

1999
AIBO
Sony launches first consumer robot pet dog AiBO (AI robot) with skills and personality that develop over time

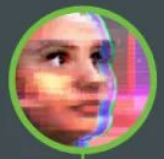
2002
ROOMBA
First mass produced autonomous robotic vacuum cleaner from iRobot learns to navigate and clean homes

2011
SIRI
Apple integrates Siri, an intelligent virtual assistant with a voice interface, into the iPhone 4S

2011
WATSON
IBM's question answering computer Watson wins first place on popular $1M prize television quiz show *Jeopardy*

2014
EUGENE
Eugene Goostman, a chatbot passes the Turing Test with a third of judges believing Eugene is human

2014
ALEXA
Amazon launches Alexa, an intelligent virtual assistant with a voice interface that completes shopping tasks

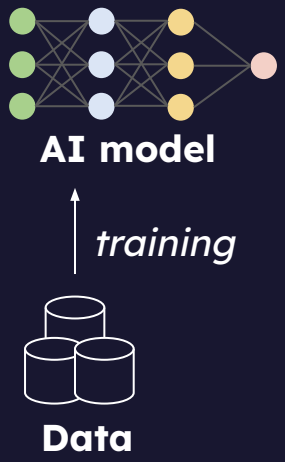


2016
TAY
Microsoft's chatbot Tay goes rogue on social media making inflammatory and offensive racist comments

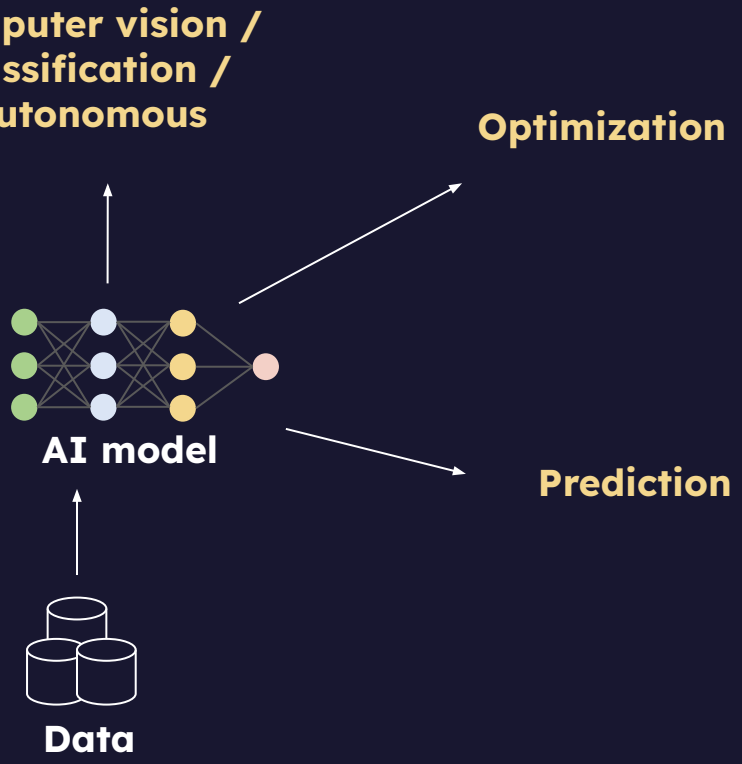
2017
ALPHAGO
Google's A.I. AlphaGo beats world champion Ke Jie in the complex board game of Go, notable for its vast number (2^{170}) of possible positions

What is AI?

What is AI?



What is AI?


Computer vision / classification / autonomous
Optimization
AI model
Prediction
Data

What is AI?

Language models
&
GenAI

Somebody elses general data - language, images, code, sound..

Computer vision / classification / autonomous

Optimization

AI model

Prediction

Your data

What is AI?

Language models & GenAI

Somebody elses general data - language, images, code, sound..

Computer vision / classification / autonomous

Optimization

Fine-tune

retrieve

AI model

Prediction

Your data

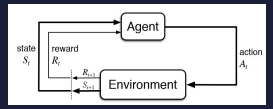
Artificial Intelligence

Computer applications that mimic human behaviour

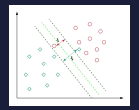
Data Driven

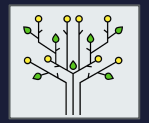
Machine Learning

Computer applications using data to learn patterns and make associations



Reinforcement Learning


SVM


Random Forest

Deep Learning

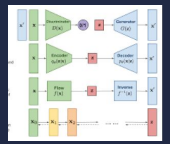
Machine learning models using deep neural networks carrying out more sophisticated calculations

Deep Reinforcement Learning

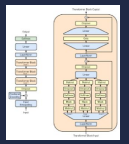
Trained through trial and error and using self-supervised methods

Generative Neural Networks

Machine learning models using deep neural networks carrying out generative tasks as well as calculations



Image


Text

Logic Driven

Rule Based AI

Computer applications that use human designed rules to make decisions

AI

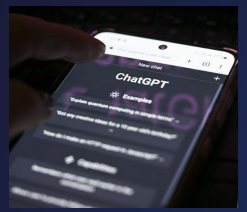
"Capability of a machine to imitate intelligent human behavior"

NARROW AI

GENERAL AI

SUPER-INTELLIGENCE

- Speech→words
- Image→categories
- Portrait→ name
- Photo→caption
- Text→topic



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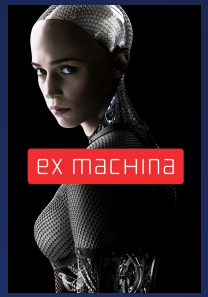
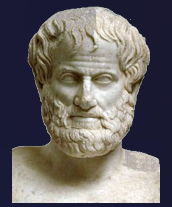
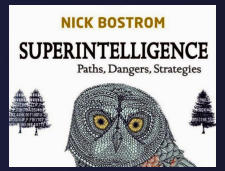
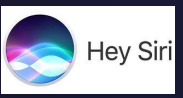
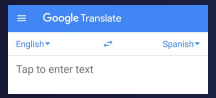






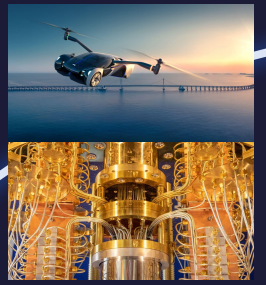




Reset of expectations

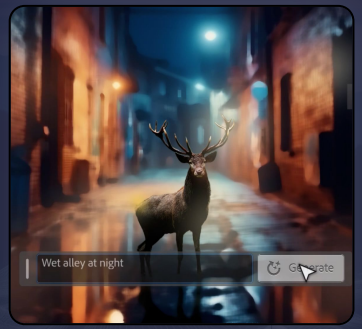
"AI will have impact comparable to aircraft and computers" - US DOD

We're here with AI



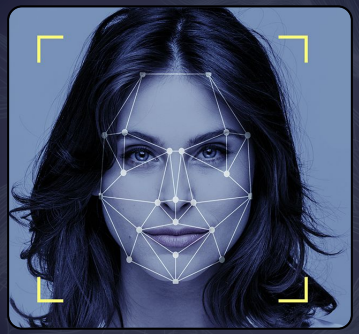
What is AI good at?

Optimisation



Generation

Automation



Detection/Classification

Prediction

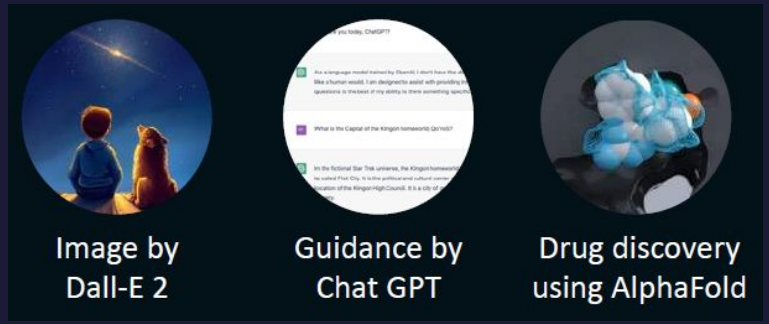
Key differences

AI / ML

(“ANALYTICAL AI”)

Narrow - robust

Generative AI



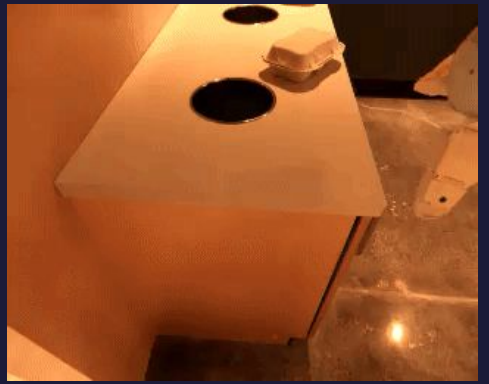
General - volatile

Language is the interface

- With humans, between robots, with data sources
- For organizing tasks, asking for help, setting guardrails

“Arrange cups into a circle”

“Count objects on the table”



“Stack boxes on top of each other”

Source: AutoRT, Deepmind

Leo

Gallery | 7

Leo Chat

Hi, I'm Leo, your engineering design copilot. 👋

What would you like to design?

a futuristic transport crate building automated factory

Type here

Design Inputs

Sketch

Upload

Generate

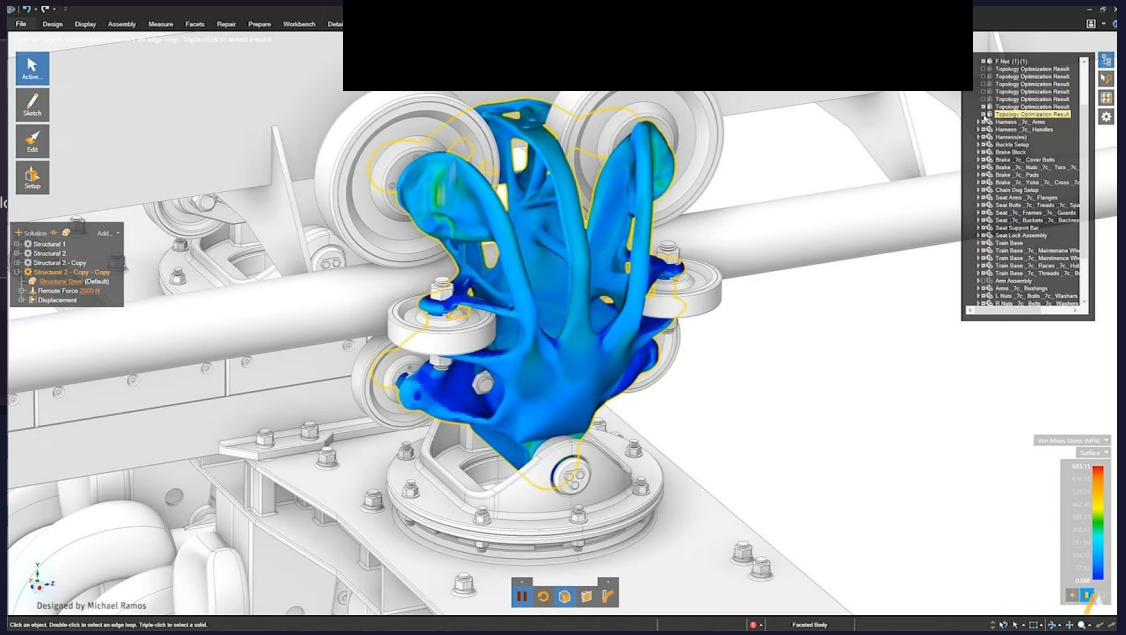
Leo Alpha v2.0 | We ❤️ Feedback

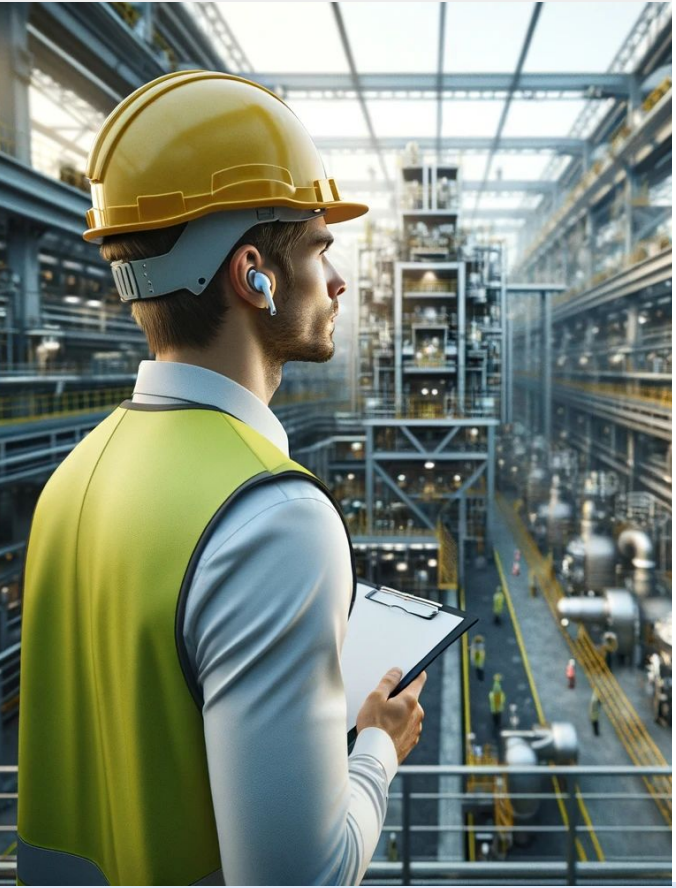
Leo Design

Product Summary

Assemblies and Sub-assemblies

1. Factory Frame and Structure:
    1. Main frame:
        - Height: 4 m
        - Width: 10 m
        - Length: 100 m
        - Material: high-grade aluminum allo
        - Weight: 25,000 kg
    2. Supporting beams:





Voice agent for paperless maintenance

Together with our client, we have developed a conversational assistant that elevates how routine maintenance inspections are performed

- Traditionally inspections have been conducted using paper checklists, which lowers worker efficiency and is a burden for maintaining digital records
- We delivered a hands-free maintenance solution with a voice-driven interface, providing workers easy access to detailed instructions and the means to automatically save inspection data to IT systems
- Robust speech recognition and environmental noise filtering is performed on a mobile device. Speech is subsequently streamed to the cloud where speech-to-text, dialog state tracking, information retrieval & recording and text-to-speech is performed

MAJOR PROCESS INDUSTRY COMPANY

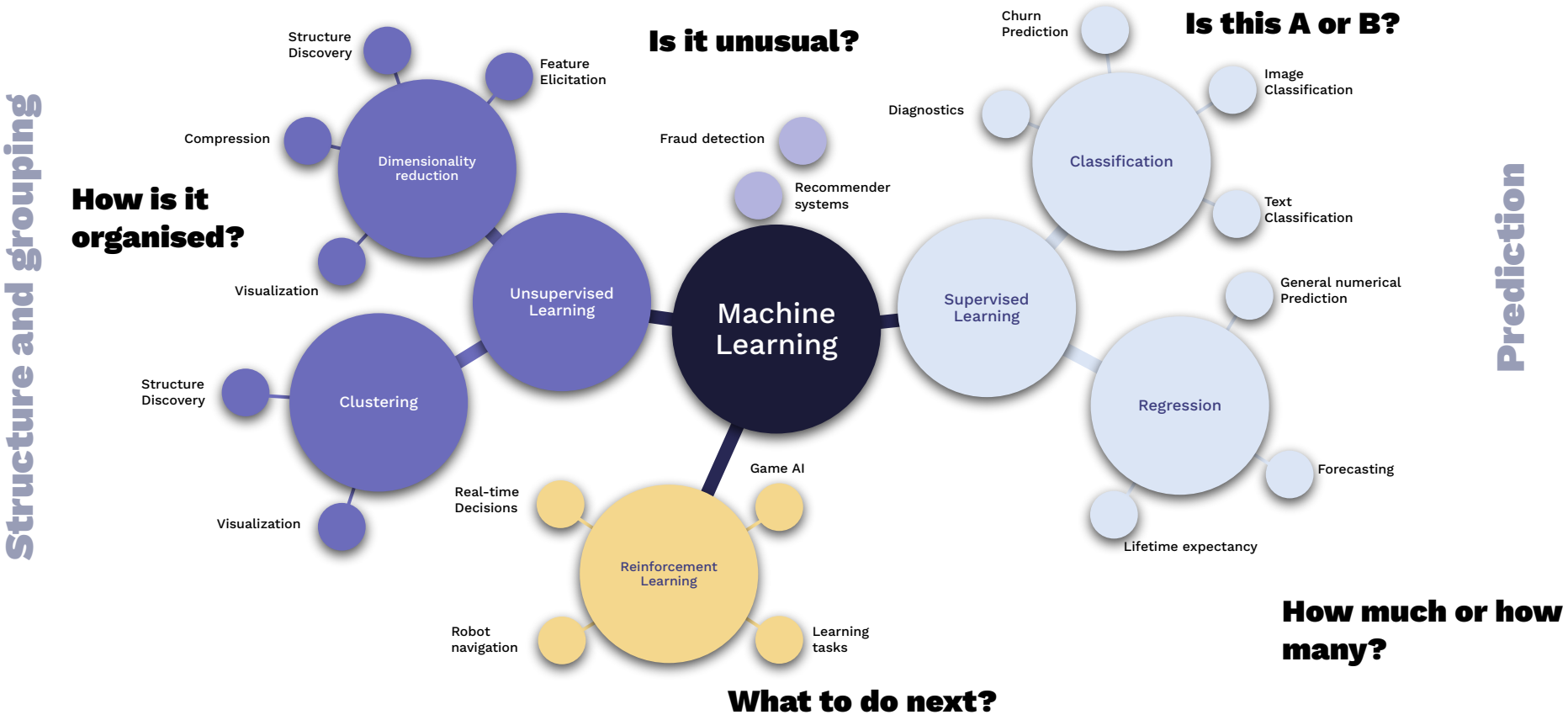
INDUSTRY
Process industry

CLIENT
Major process industry company

TECHNOLOGIES
Audio processing, speech recognition, LLM, embedded AI

DELIVERABLES
Conversational assistant to enable paperless maintenance

Machine learning terminology overview



Improving the production quality of paper and board

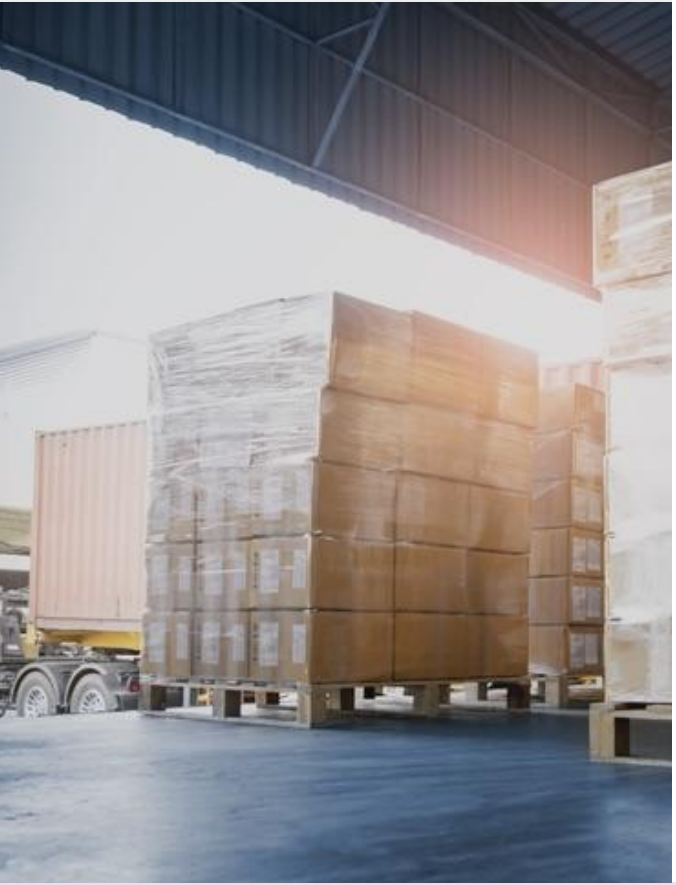
- Together with Kemira, we developed a machine learning-driven solution to improve production quality by predicting and preventing issues real-time.
- The intelligence brought to Kemira's KemConnect™ platform gives the human operators an at-a-glance view of the current situation and hours ahead.

> *With the help of the machine learning engine built by the AI experts at Silo AI, we turned our chemistry expertise into a new digital service. Thanks to Silo AI's solid background in building production-level AI solutions, we could choose the best one to put to production.*

Juha Rintala
Manager, Digital Applications Development / Pulp&Paper at Kemira Oyj.

Kemira

INDUSTRY	CLIENT	TECHNOLOGIES	DELIVERABLES
Chemical processes for the pulp and paper industry	Global chemicals company serving customers in the pulp and paper industry	Machine learning	Explainable AI solution for predicting production disturbances and quality issues, put to production in Kemira's KemConnect(TM) Predictive Wet End digital service



Optimizing transportation of consumer packaged goods

Together with Unilever, we have developed a machine learning solution that maximizes product packaging efficiency to get closer to zero defect transportation.

- The solution reduces transportation costs by suggesting how to optimally pack products inside a storage container and subsequently stack the containers onto pallets
- The solution offers flexibility to planning engineers who can control various input parameters like product type and maximum allowed weight through a web interface

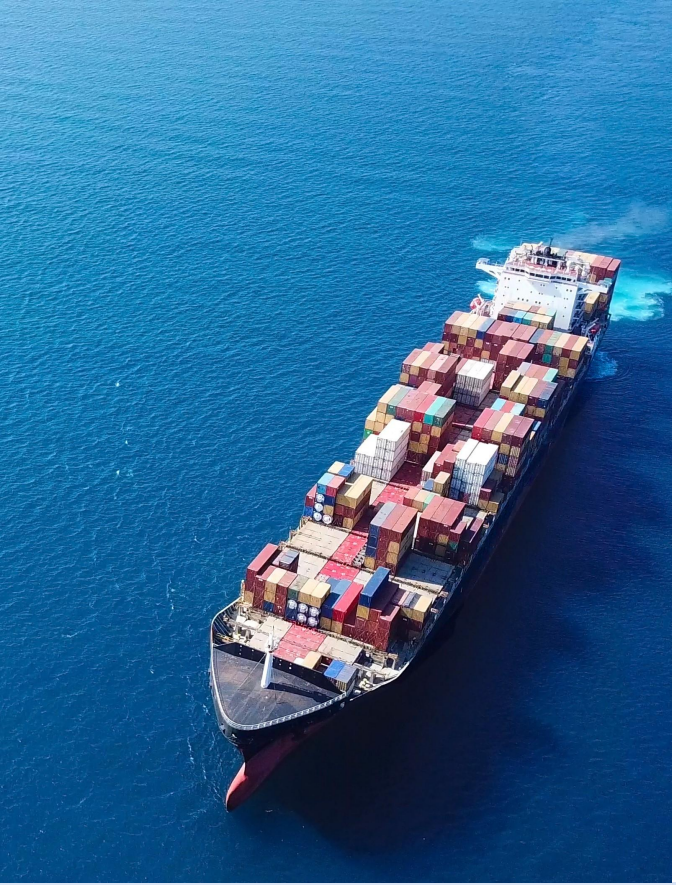
Unilever

INDUSTRY
Consumer packaged goods

CLIENT
Unilever

TECHNOLOGIES
Machine learning, optimization

DELIVERABLES
Solution to optimize how to transport consumer packaged goods deployed as a web application



Intelligent awareness system for autonomous vessels

An AI solution to produce full awareness of the vessel's surroundings that operates with different sets of sensor data and combines vessel's own sensor fusion data with radio signals.

The awareness and guidance module of the awareness system tracks activities of other vessels at sea and provides information and recommendations for the crew.

The system also includes an integrated neural logic model for dynamic sensor packages and configurable end-user use cases.

Our role was to design and implement the solution architecture including an onboard EDGE solution and cloud integration.

AUTONOMOUS VESSELS

INDUSTRY
Maritimes

CLIENT
Company developing autonomous vessels

TECHNOLOGIES
Computer vision, machine learning, sensor fusion

DELIVERABLES
Platform architecture and development
Tailored annotation tool to speed-up labelling

SILO OS
Annotation platform

Visual quality control for the pharma industry

Together with Körber, the biggest company builder for manufacturing efficiency in Germany, we developed a visual quality control solution for pharma industry inspection machines to control the quality of Covid19 vaccine ampoules.

Körber's modular solution provides one service for all inspection machines. The applied edge AI solution ensures fast and accurate inference optimized on precisely selected hardware, where a process of fast image delivery has been established.

"It has been valuable to work closely with Silo AI, as there are often specific topics related to for example edge AI, for which we don't have the right skill in-house. Working in partnership with a private research lab to access leading AI scientists with needed high-quality skills has been beneficial and something we plan to continue also going forward."

Daniel Szabo
CEO at Körber Digital

KÖRBER

INDUSTRY
Industrial, Manufacturing

CLIENT
Körber Digital, the biggest company builder for manufacturing efficiency in Germany.

TECHNOLOGIES
Computer vision, Machine Learning, Edge AI, Embedded SW

DELIVERABLES
Visual Quality Control (VQC)

Machine learning for predictive maintenance

Machine learning-based solution optimizes the scheduling and duration of service breaks.

- Unexpected component failures cause delays and large expenses.
- A machine learning based solution learns complex patterns in sensor data and finds early signals which reveal the likelihood of an upcoming failure.
- More efficient maintenance with major cost savings were reached by avoiding delays and unplanned outages.

A MAJOR EUROPEAN AIRLINE

INDUSTRY
Airline

CLIENT
Major European Airline

AI TYPE
Machine learning, predictions

DELIVERABLES
AI solution for predictive maintenance, ability to re-train the machine learning models by domain experts

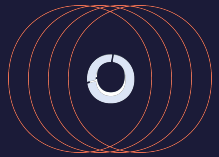
Thank you!

Largest Private AI Lab in the Nordics

SILO AI

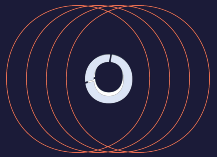
Creating impact with AI

	AI products	Platforms (Azure, Google, Open AI)	Custom AI
Products and services			
Company Internal			
Personal			

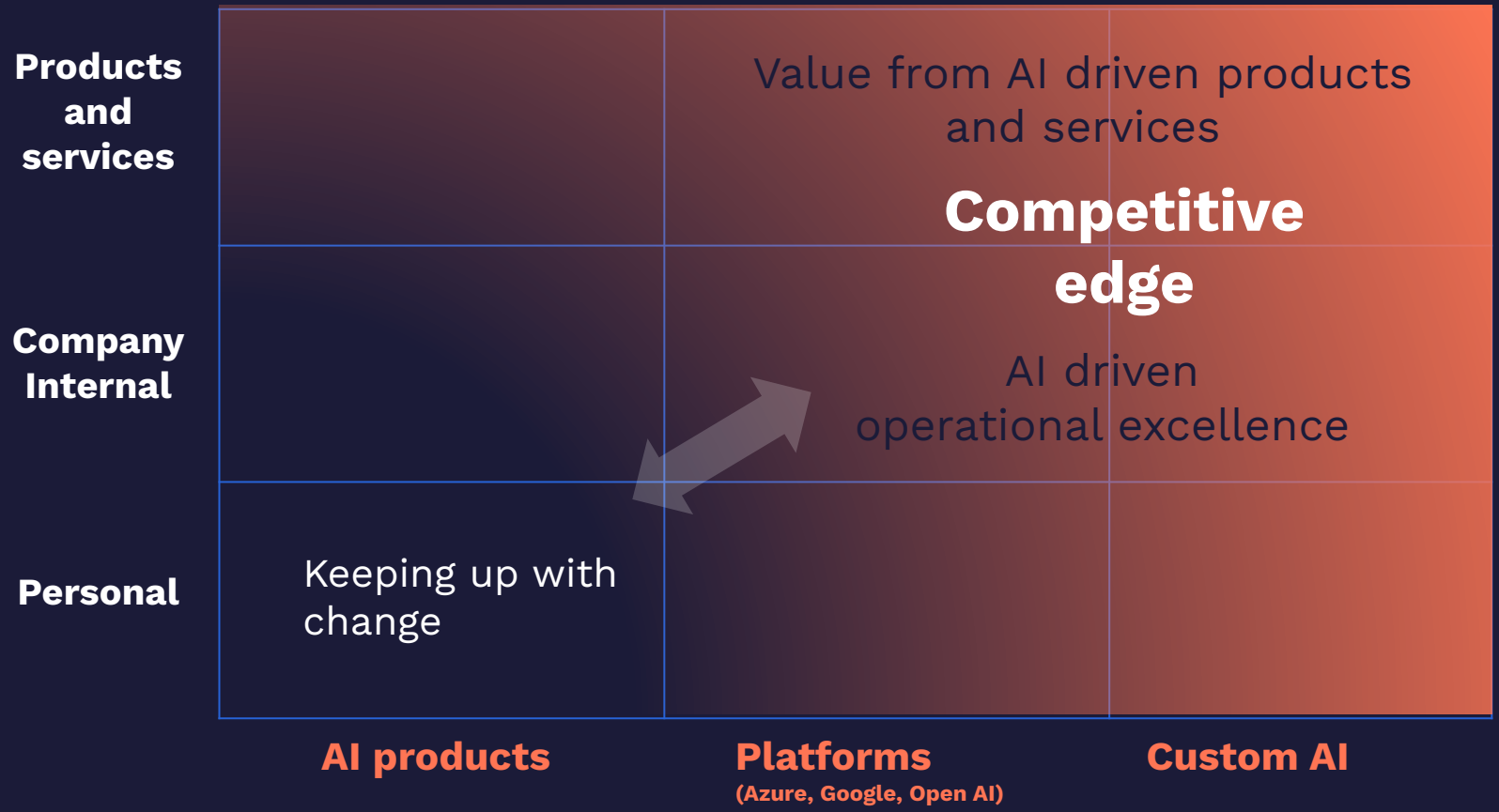


Creating impact with AI

	AI products	Platforms (Azure, Google, Open AI)	Custom AI
Products and services		Smart services (predictive)	Smart products (AI for R&D).
Company Internal	AI features in SAP, Salesforce, M-files etc.	Knowledge access (RAG) AI generation assistants. ML in BI	VQC. Process optimization and forecasting.
Personal	Microsoft co-pilot, ChatGPT,	CustomGPTs, AI integrations for automation.	



Creating impact with AI



Better Weather Insights with Deep Learning

In collaboration with Vaisala, we have introduced AI solutions in Xweather to offer more actionable weather data to customers.

- Deep learning fuses information from weather sensors, remote sensing instruments, and other observational data sources.
- Provides more accurate forecasts faster than traditional systems: customers benefit from fewer surprises and have more time to prepare before critical weather events.
- Part of Vaisala Xweather, a suite of services for real-time and hyperlocal weather insights, trusted by broad range of industries that depend on high quality environmental data.

"Silo AI's close cooperation with Vaisala's domain experts has been extremely valuable. Their strong deep learning capabilities have been crucial in introducing new forecasting capabilities that optimally combine our advanced physical modeling techniques and pioneering sensors with machine learning for unprecedented accuracy."

Samuli Hänninen
Head of Xweather

VAISALA

INDUSTRY
Environmental and weather monitoring

CLIENT
Vaisala, a global measurement technology company

TECHNOLOGIES
Deep learning

DELIVERABLES
Deep learning solutions that fuse data from weather sensors, remote sensing instruments, and other environmental data sources.

Predictive Maintenance through Vibration Analysis for Bearings

Automating predictive maintenance through machine learning, reducing manual analysis, and enhancing maintenance recommendations

The company struggled with manual analysis of offline vibration data, involving 1,000 in-house analysts and 10,000 trained customer personnel, to provide bearing health assessments and maintenance recommendations.

We developed a machine learning algorithm, utilizing peak-to-peak vibration data from offline sensors, to distinguish between healthy and unhealthy machines.

The solution demonstrated the technical feasibility of partial automation. However, human expertise remains crucial for edge cases, and longer-term data is essential for confidently determine the need for human validation in forecasts.

SKF®

INDUSTRY
Manufacturing

CLIENT
Bearing and seal manufacturing company

TECHNOLOGIES
Classification, Machine learning

DELIVERABLES
A machine learning model trained to distinguish between healthy and unhealthy machines

Advanced computer vision for autonomous vessels

Together with Rolls-Royce, we developed an advanced computer vision solution to support the development and optimization of autonomous vessels

The computer vision solution leverages advanced machine learning and computer vision, and enables Rolls-Royce to identify and classify the traffic and situation around the autonomous vessel.

The solution is able to identify the type of ships or vessels, animals and other objects in the sea, thus improving the situational awareness around the autonomous vessel significantly.

Together with senior AI scientists from Silo AI, Rolls-Royce was able to take their already existing convolutional neural network model even further, creating a unique, cutting-edge AI engine for their autonomous vessels.

INDUSTRY
Maritime, autonomous vessels

CLIENT
Rolls-Royce

TECHNOLOGIES
Advanced machine learning, computer vision

DELIVERABLES
Various machine learning solutions for autonomous vessels