

**OST**  
Ostschweizer  
Fachhochschule

# A Technical Introduction to AI

**Prof. Dr. Guido M. Schuster**

Director ICAI - Interdisciplinary Center for Artificial Intelligence




**ICAI**

ICAI/IQT/OST

# My first presentation ...

## A Technical Introduction to AI

$$\begin{aligned}\Delta \mathbf{W} &= \begin{bmatrix} \Delta w_{11} & \Delta w_{12} & \Delta w_{13} \\ \Delta w_{21} & \Delta w_{22} & \Delta w_{23} \end{bmatrix} \\ &= \begin{bmatrix} \alpha \frac{1}{N} (\delta_{11} x_{11} + \dots + \delta_{N1} x_{N1}) & \alpha \frac{1}{N} (\delta_{11} x_{12} + \dots + \delta_{N1} x_{N2}) & \alpha \frac{1}{N} (\delta_{11} x_{13} + \dots + \delta_{N1} x_{N3}) \\ \alpha \frac{1}{N} (\delta_{12} x_{11} + \dots + \delta_{N2} x_{N1}) & \alpha \frac{1}{N} (\delta_{12} x_{12} + \dots + \delta_{N2} x_{N2}) & \alpha \frac{1}{N} (\delta_{12} x_{13} + \dots + \delta_{N2} x_{N3}) \end{bmatrix} \\ &= \begin{bmatrix} \alpha \frac{1}{N} \left( [\delta_{11} \dots \delta_{N1}] \cdot \begin{bmatrix} x_{11} \\ \vdots \\ x_{N1} \end{bmatrix} \right) & \alpha \frac{1}{N} \left( [\delta_{11} \dots \delta_{N1}] \cdot \begin{bmatrix} x_{12} \\ \vdots \\ x_{N2} \end{bmatrix} \right) & \alpha \frac{1}{N} \left( [\delta_{11} \dots \delta_{N1}] \cdot \begin{bmatrix} x_{13} \\ \vdots \\ x_{N3} \end{bmatrix} \right) \\ \alpha \frac{1}{N} \left( [\delta_{12} \dots \delta_{N2}] \cdot \begin{bmatrix} x_{11} \\ \vdots \\ x_{N1} \end{bmatrix} \right) & \alpha \frac{1}{N} \left( [\delta_{12} \dots \delta_{N2}] \cdot \begin{bmatrix} x_{12} \\ \vdots \\ x_{N2} \end{bmatrix} \right) & \alpha \frac{1}{N} \left( [\delta_{12} \dots \delta_{N2}] \cdot \begin{bmatrix} x_{13} \\ \vdots \\ x_{N3} \end{bmatrix} \right) \end{bmatrix} \\ &= \alpha \cdot \frac{1}{N} \left( \begin{bmatrix} \delta_{11} & \delta_{N1} \\ \vdots & \vdots \\ \delta_{12} & \delta_{N2} \end{bmatrix} \cdot \begin{bmatrix} x_{11} & x_{12} & x_{13} \\ \vdots & \vdots & \vdots \\ x_{N1} & x_{N2} & x_{N3} \end{bmatrix} \right) \end{aligned}$$


$$\Delta \mathbf{W} = \alpha \cdot (\boldsymbol{\delta}^T \cdot \mathbf{X}) / N$$

# My first presentation ...

## A Technical Introduction to AI

Prof. Dr. Agathe Koller



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Mechatronik  
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... was rejected 😊



**OST**  
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# A Gentle Introduction to AI

**Prof. Dr. Guido M. Schuster**  
Director ICAI - Interdisciplinary Center for Artificial Intelligence



**ICAI**

ICAI/IQT/OST

# Where does this all come from?

## NEW NAVY DEVICE LEARNS BY DOING

Psychologist Shows Embryo  
of Computer Designed to  
Read and Grow Wiser

WASHINGTON, July 7 (UPI)—The Navy revealed the embryo of an electronic computer today that it expects will be able to walk, talk, see, write, reproduce itself and be conscious of its existence.

The embryo—the Weather Bureau's \$2,000,000 "704" computer—learned to differentiate between right and left after fifty attempts in the Navy's demonstration for newsmen.

The service said it would use this principle to build the first of its Perceptron thinking machines that will be able to read and write. It is expected to be finished in about a year at a cost of \$100,000.

Dr. Frank Rosenblatt, designer of the Perceptron, conducted the demonstration. He said the machine would be the first device to think as the human brain. As do human be-

ings, Perceptron will make mistakes at first, but will grow wiser as it gains experience, he said.

Dr. Rosenblatt, a research psychologist at the Cornell Aeronautical Laboratory, Buffalo, said Perceptrons might be fired to the planets as mechanical space explorers.

### Without Human Controls

The Navy said the perceptron would be the first non-living mechanism "capable of receiving, recognizing and identifying its surroundings without any human training or control."

The "brain" is designed to remember images and information it has perceived itself. Ordinary computers remember only what is fed into them on punch cards or magnetic tape.

Later Perceptrons will be able to recognize people and call out their names and instantly translate speech in one language to speech or writing in another language, it was predicted.

Mr. Rosenblatt said in principle it would be possible to build brains that could reproduce themselves on an assembly line and which would be conscious of their existence.

In today's demonstration, the "704" was fed two cards, one with squares marked on the left side and the other with squares on the right side.

### Learns by Doing

In the first fifty trials, the machine made no distinction between them. It then started registering a "Q" for the left squares and "O" for the right squares.

Dr. Rosenblatt said he could explain why the machine learned only in highly technical terms. But he said the computer had undergone a "self-induced change in the wiring diagram."

The first Perceptron will have about 1,000 electronic "association cells" receiving electrical impulses from an eye-like scanning device with 400 photo-cells. The human brain has 10,000,000,000 responsive cells, including 100,000,000 connections with the eyes.

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July 7, 1958 New York  
Times...

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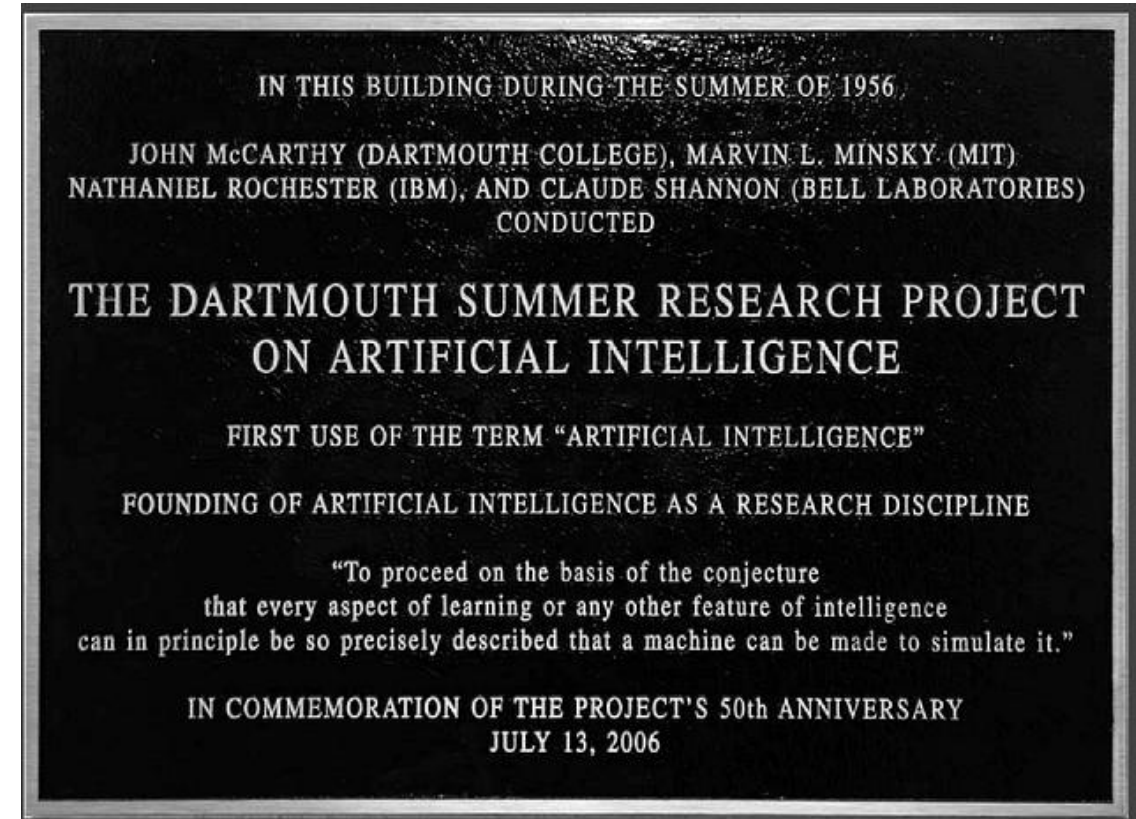
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# Summer of 1956 – the term "Artificial Intelligence" is born



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## Claude Shannon

[Article](#) [Talk](#)

From Wikipedia, the free encyclopedia

**Claude Elwood Shannon** (April 30, 1916 – February 24, 2001) was an American [mathematician](#), [electrical engineer](#), [computer scientist](#), [cryptographer](#) and inventor known as the "father of [information theory](#)" and as the "father of the [Information Age](#)".<sup>[1]</sup> Shannon was the first to describe the Boolean gates (electronic circuits) that are essential to all digital electronic circuits, and was one of the founding fathers of [artificial intelligence](#).<sup>[2][3][4][1]</sup> Shannon is credited with laying the foundations of the [Information Age](#).<sup>[5][6][7]</sup>



**1937:**

A founder of modern computers

- Electronic circuits can be used to implement Boolean Algebra

**1939-45:**

A founder of modern cryptography

- "A Mathematical Theory of Cryptography"

**1948:**

A founder of information theory

- "A Mathematical Theory of Communication"

**1956:**

A founder of artificial intelligence

- Theseus was the first electrical device to learn by trial and error, being one of the first examples of artificial intelligence

# Age of AI

- **We are entering the Age of AI**
  - Comparable in its effects only to the introduction of
    - Fire
    - Agriculture
    - **Electricity**
- **Decisions, Decisions, Decisions ...**
  - In the age of AI, computers make decisions for and about us every day
    - Work: HR Analytics
    - Love: Tinder
    - Entertainment: YouTube Video
    - Finances: Credit Card Approval
    - And many more ...

The Age of A.I.  
And Our Human Future

Henry A.  
Kissinger

x

Eric  
Schmidt

x

Daniel  
Huttenlocher

# Data

- **Data** is fundamental to AI, but what kind of data is there and where does it come from?

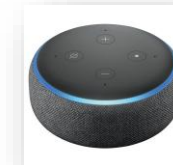


- IT systems

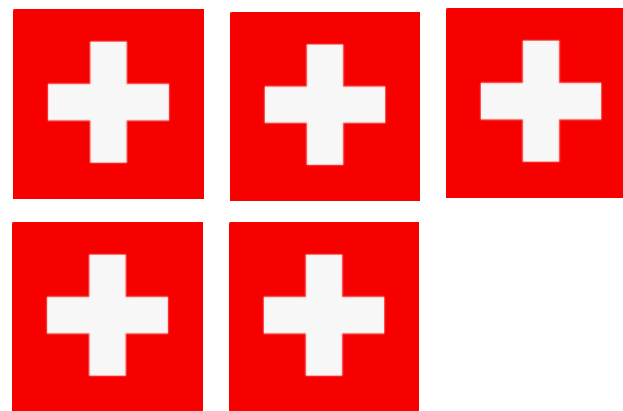
- Books
- Wikipedia
- The Internet
- Medical records
- Credit cards
- Access cards
- Browser history ...

- Dedicated sensors

- Cameras
- Microphones
- Pressure sensors
- IMU
- LIDAR
- RADAR
- And many more ...

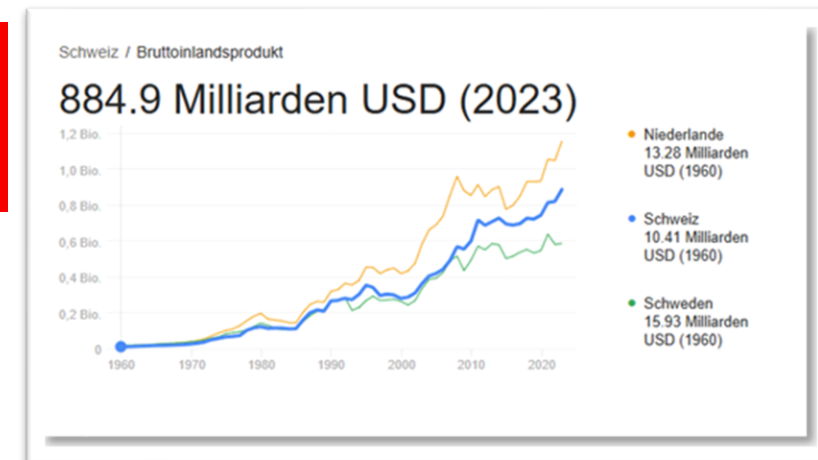


# Data & Computing



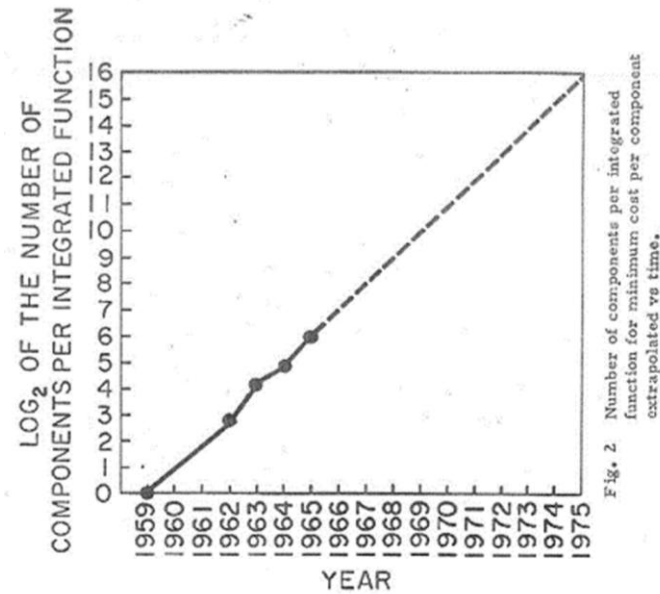
**NVIDIA**

- DGX-2 Deep Learning Supercomputer
  - 2 Petaflops (2e15) per second
  - Earth: 8e9 people
    - $2e15/8e9=1/4e6=$  250'000 flops/person per second



# Data & Computing

- **Moore's Law** was formulated in 1965 by Gordon Moore, one of the founders of Intel
- His original observation was that the number of transistors on a microchip roughly doubles every two years
- Recently, a doubling happens approximately ever 1.5 years



G. E. Moore: «Cramming more components onto integrated circuits», In: Electronics, vol. 38, number 8, 19. April 1965



2018: 1

2019.5: 2


2021: 4

2022.5: 8

2024: 16



# Data & US Cloud Computing?


 Swiss IT Magazine

## Unter Eid: Microsoft kann Schutz vor Cloud Act nicht garantieren

Microsoft schafft laut eigener Aussage eine souveräne Cloud für Europa, um die Datenschutzbedenken auf dem alten Kontinent zu adressieren. Ein...

vor 1 Monat




 Netzwoche

## Warum Ihre Daten besser in der Schweiz bleiben sollten

Die Wahl des richtigen Hosting-Standorts für Software-as-a-Service-Lösungen gewinnt angesichts der steigenden Anfor.

19.05.2025




 Schweizer Radio und Fernsehen

## Microsoft und Co.: Die Schweiz ist von den USA abhängig

In den vergangenen zehn Jahren haben Bund und Kantone mehr als 1.1 Milliarden Franken allein an Microsoft bezahlt.

07.03.2025




 SwissCybersecurity.net

## Third Country Intercept Risk in der Cloud

Daten in der Cloud sind oft nicht so sicher, wie viele denken. Die Gesetzeslage in den USA ermöglicht weitreichende Überwachungsmaßnahmen.

04.04.2025



 20 Minuten

## Bund setzt auf Microsoft 365: Sorgen um Schweizer Staatsgeheimnisse wachsen

Bundesangestellte nutzen Microsoft 365, während Experten vor möglichen Sicherheitsrisiken durch den Cloud Act warnen.

vor 2 Wochen



Der **CLOUD Act (Clarifying Lawful Overseas Use of Data Act<sup>[1]</sup>)** ist ein seit 2018 bestehendes **US-amerikanisches** Gesetz zum Zugriff der US-Behörden auf gespeicherte Daten im Internet. Er ergänzt Titel 18 **United States Code**, Chapter 121 (**Stored Communications Act**) um 18 US Code § 2713.<sup>[2]</sup>

## Inhalt [\[ Bearbeiten \]](#) [\[ Quelltext bearbeiten \]](#)

Das Gesetz verpflichtet amerikanische Internet-Firmen und IT-Dienstleister, US-Behörden auch dann Zugriff auf gespeicherte Daten zu gewährleisten, **wenn die Speicherung nicht in den USA erfolgt.**

# Data & Swiss Cloud Computing

## Try Apertus

Public AI Inference Utility

 ↑

What's public AI?

Was ist souveräne KI?

C'est quoi, ce plan secret ultra top secret?

### With love, from Switzerland

Imanol's team just launched Apertus, the most powerful open-source language model ever released by a public institution.

[Read more](#)



# Data & Local Computing!



Open WebUI gemma3:27b +

Neuer Chat  
Suchen  
Notizen  
Arbeitsbereich

Chats  
Heute  
KI in Hochschullehre

Vorherige 30 Tage  
KI Einführung  
St.Gallen Savings Measures  
Kanton St.Gallen Organisation

Juli  
SVA: Atomic Energy

Juni  
Image Generation Feedback

Wie kann man KI gut in den Unterricht einer Hochschule integrieren?

**gemma3:27b**  
Die Integration von KI in den Hochschulunterricht bietet enormes Potenzial, erfordert aber auch sorgfältige Planung und Überlegung. Hier sind einige Ideen, wie man KI gut integrieren kann, gegliedert nach Aspekten und mit Beispielen:

**I. Pädagogische Überlegungen & Rahmenbedingungen:**

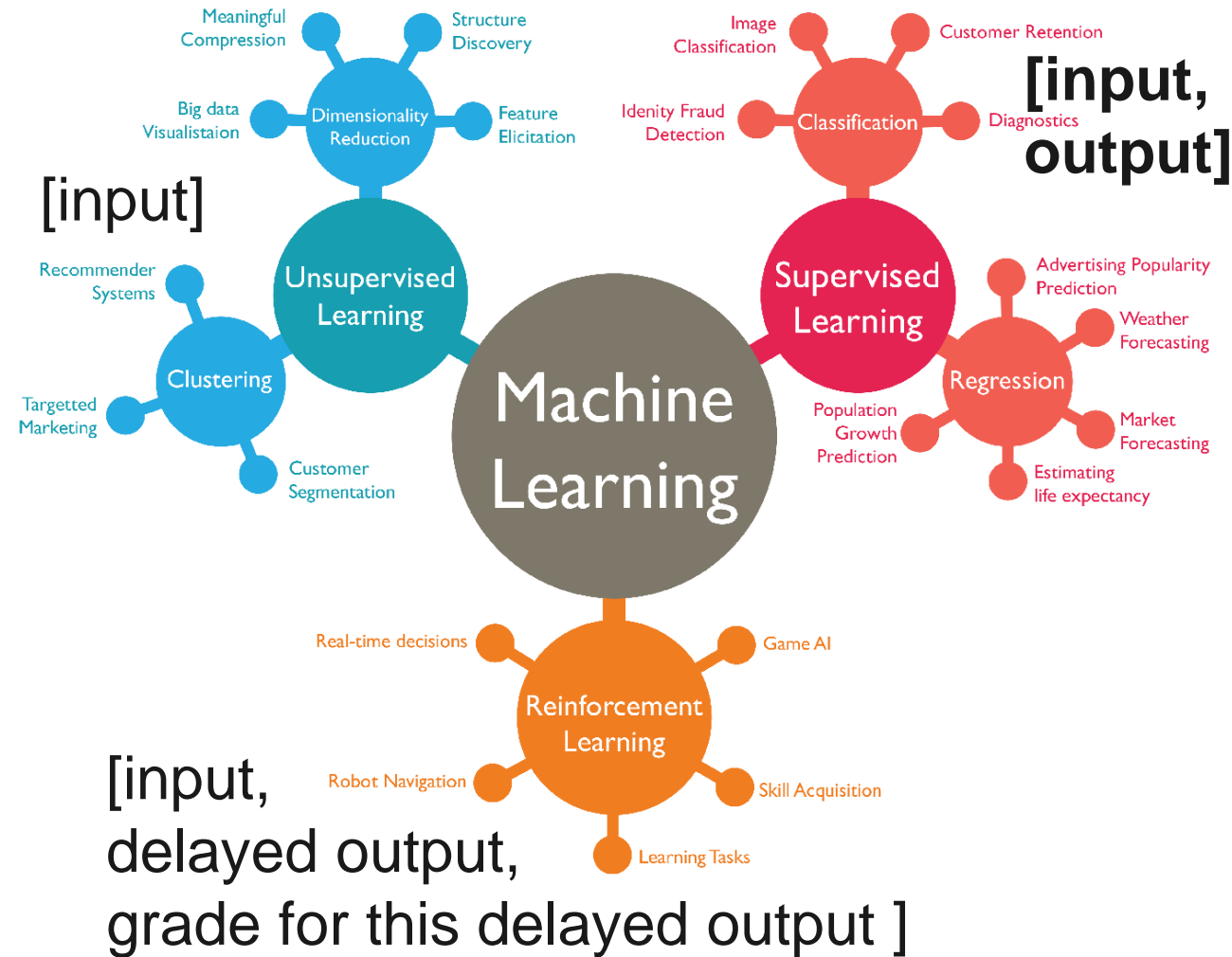
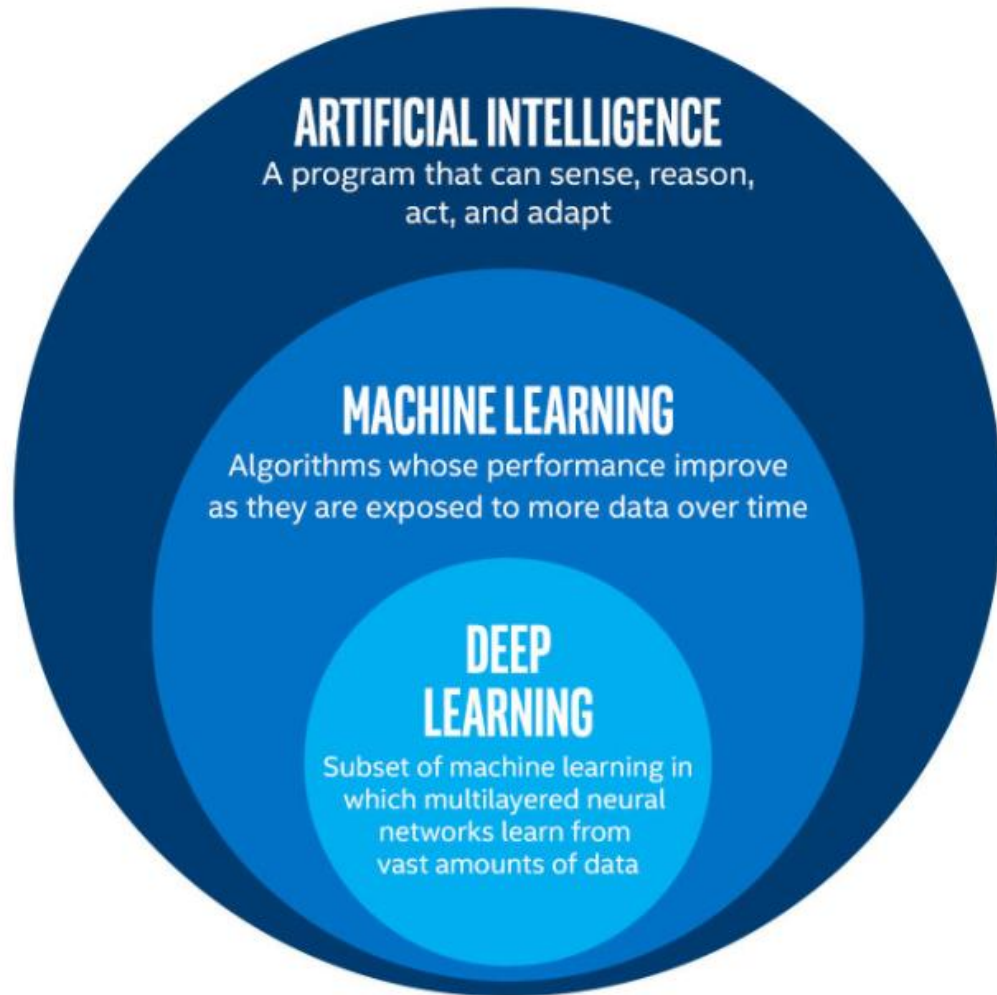
- **Klare Zielsetzung:** Was soll mit KI im Unterricht erreicht werden? (Effizienzsteigerung, neue Lernformen, Förderung kritischen Denkens, Vorbereitung auf den Arbeitsmarkt?)
- **Transparenz:** Studierende müssen verstehen, *wie* und *warum* KI eingesetzt wird. Die Grenzen der KI müssen klar benannt werden.
- **Kritisches Denken fördern:** KI darf nicht als "Black Box" behandelt werden. Studierende sollen verstehen, wie KI-Modelle funktionieren, welche Daten sie verwenden und welche potenziellen Bias existieren.
- **Ethische Aspekte:** Diskussionen über die ethischen Implikationen von KI (z.B. Datenschutz, Fairness, Verantwortlichkeit) sind unerlässlich.
- **Datenschutz beachten:** Der Einsatz von KI-Tools muss im Einklang mit den Datenschutzbestimmungen erfolgen.
- **Fortbildung der Lehrenden:** Lehrende benötigen Schulungen, um KI-Tools effektiv zu nutzen und didaktisch sinnvoll in den Unterricht zu integrieren.
- **Hybride Ansätze:** KI sollte *ergänzend* zum traditionellen Unterricht eingesetzt werden, nicht als Ersatz. Der menschliche Aspekt der Lehre (Diskussion, Feedback, individuelle Betreuung) bleibt wichtig.

- DGX H200 ~340kCHF
  - You can host your own LLMs **locally**, for example “Deepseek v3”
  - **Guaranteed no data privacy problems!**

[Open WebUI](#)

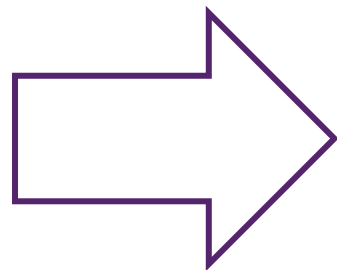
# Data & Computing & Algorithms

[What kind of data?]



# Supervised Machine Learning

- In AI, there is a recurring theme:
  - Examples (training data) are used to teach a computer a pattern between input data and output data
  - The computer then generalizes this pattern to make reasonable decisions (similar to the examples) in new situations (test data)
- This is **supervised machine learning** and the most successful application of AI



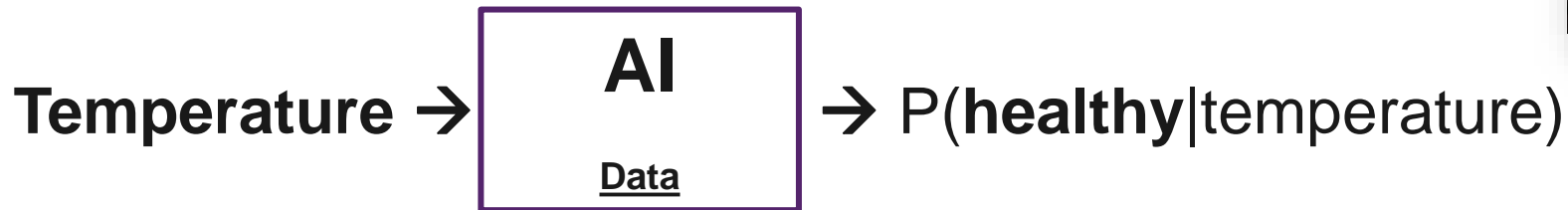
The computer develops an intuition for the situation

This is similar to a human, but humans need fewer examples

# Supervised Machine Learning

- The output of an AI system is **usually not** a simple decision in terms of **YES** or **NO**
  - AI estimates probabilities from example data, which decision to make, a human must influence the final decision by setting the cost of those decisions

**For a measured temperature, is this person**



**healthy or sick?**

# Supervised Machine Learning

- **A simple example**

- Based on the temperature, the AI estimates the probability whether a person is **healthy** or **sick**

$P(\text{healthy}|\text{temperature})$

- For this crucial estimation, data from the past (examples, also called training data) are used, where doctors have made this decision



# Supervised Machine Learning

- Training data:

Person #	Temperature [C]	Doctor decision [healthy] [sick]
1	37.25	healthy
2	36.75	healthy
3	39.50	sick
4	40.25	sick
5	38.25	healthy
6	36.75	healthy
...	...	...
100'000	41.25	sick

- **Measurement:** Temperature T in Celsius
- **Decision:** **healthy** or **sick**



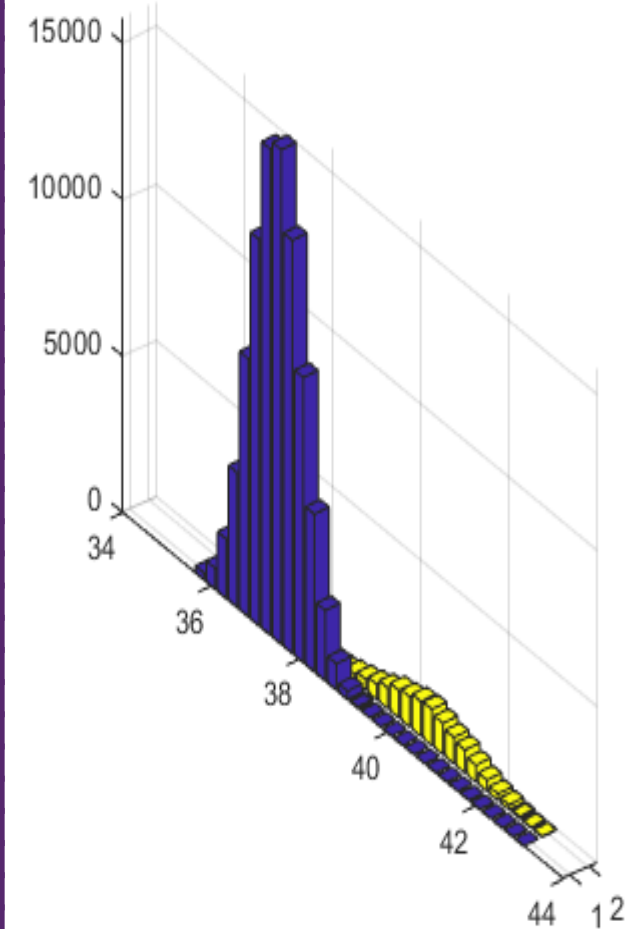
# Supervised Machine Learning

- Training data (examples):

Person #	Temperature [C]	Decision [healthy] [sick]
1	37.25	healthy
2	36.75	healthy
3	39.50	sick
4	40.25	sick
5	38.25	healthy
6	36.75	healthy
...	...	...
100'000	41.25	sick

Create a 2D Histogramm

Temperature	#healthy	#sick
35.75	229	0
36.00	676	0
36.25	1910	0
36.50	4314	1
36.75	8253	1
37.00	12356	3
37.25	15542	2
37.50	15812	4
37.75	13209	13
38.00	9119	32
38.25	5044	76
38.50	2261	120
38.75	850	232
39.00	271	352
39.25	65	485
39.50	9	664
39.75	1	882
40.00	0	964
40.25	0	1111
40.50	0	1154
40.75	0	1004
41.00	0	845
41.25	0	733
41.50	0	544
41.75	0	360
42.00	0	211
42.25	0	153
42.50	0	82
42.75	0	28
43.00	0	23



- Training data (examples) where doctors made the decisions (**healthy** or **sick**)
- This is the entire knowledge of the AI

# Supervised Machine Learning

- **Optimal decisions making**

- A reasonable goal is to make as few mistakes as possible
  - For a measured temperature, estimate (based on the training data) the probabilities that the person is **healthy** or **sick**

$P(\text{healthy}|\text{temperature})$

Decide **healthy**,  
if  $P(\text{healthy}|\text{temperature}) > P(\text{sick}|\text{temperature})$

→ On average, this is how the fewest mistakes are made

The Reverend  
Thomas Bayes



Portrait purportedly of Bayes used in a 1936 book,<sup>[1]</sup> but it is doubtful whether the portrait is actually of him.<sup>[2]</sup> No earlier portrait or claimed portrait survives.

**Born** c. 1701  
London, England

**Died** 7 April 1761 (aged 59)  
Tunbridge Wells, Kent, Great Britain

**Alma mater** University of Edinburgh

**Known for** Bayes' theorem  
Scientific career

**Fields** Probability

Signature

*T. Bayes.*

# Supervised Machine Learning

$$P(\text{healthy}|\text{temperature}) = \frac{(\#\text{healthy}|\text{temperature})}{(\#\text{healthy}|\text{temperature}) + (\#\text{sick}|\text{temperature})}$$

- Where each row in the histogram table corresponds to a given temperature
  - Thus,  $P(\text{healthy}|\text{temperature})$  can be calculated per temperature (row)

## Key question:

How is  $P(\text{healthy}|\text{temperature})$  estimated from the **training data**?

## Training data

Temperature	#healthy	#sick	$P(\text{healthy} \text{temperature}) = \frac{\#\text{healthy}}{\#\text{healthy} + \#\text{sick}}$
35.75	229	0	1.00
36.00	676	0	1.00
36.25	1910	0	1.00
36.50	4314	1	1.00
36.75	8253	1	1.00
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37.75	13209	13	1.00
38.00	9119	32	1.00
38.25	5044	76	0.99
38.50	2261	120	0.95
38.75	850	232	$850/(850+232)=0.79$
39.00	271	352	0.43
39.25	65	485	0.12
39.50	9	664	0.01
39.75	1	882	0.00
40.00	0	964	0.00
40.25	0	1111	0.00
40.50	0	1154	0.00
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# Supervised Machine Learning

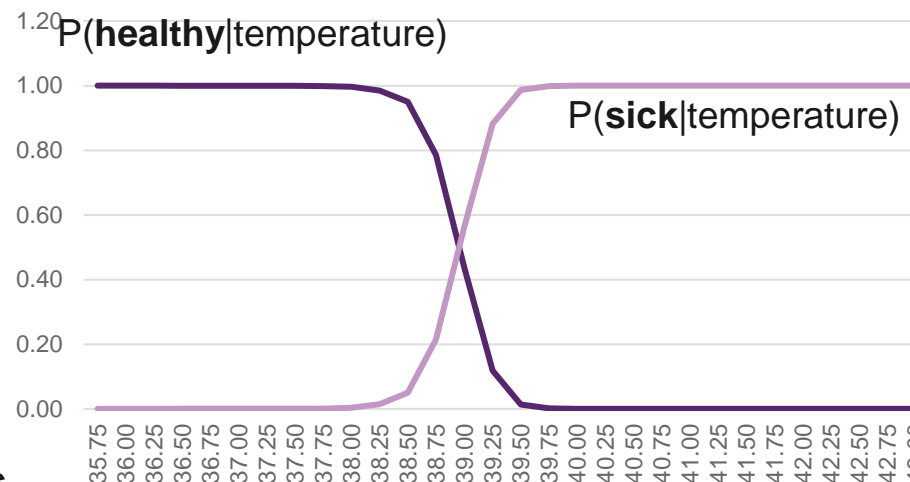
- **Optimal decision**
- After measuring the temperature, find  $P(\text{healthy}|\text{temperature})$  in the table (temperature indicates the row) and decide healthy if  $P(\text{healthy}|\text{temperature}) > \frac{1}{2}$
- **Take the option with the greatest probability**

Temperature	#healthy	#sick	$P(\text{healthy} \text{temperature}) = \frac{\text{\#healthy}}{\text{\#healthy} + \text{\#sick}}$
35.75	229	0	1.00
36.00	676	0	1.00
36.25	1910	0	1.00
36.50	4314	1	1.00
36.75	8253	1	1.00
37.00	12356	3	1.00
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37.50	15812	4	1.00
37.75	13209	13	1.00
38.00	9119	32	1.00
38.25	5044	76	0.99
38.50	2261	120	0.95
38.75	850	232	0.79
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42.00	0	211	0.00
42.25	0	153	0.00
42.50	0	82	0.00
42.75	0	28	0.00
43.00	0	23	0.00

**Makes on average the fewest mistakes**

**Decision is purely data driven!**

**If the data changes, the decision changes**



# Predictive Maintenance for Ball Bearings

Application Number: 43769.1 IP-ENG

Application Title: Industrializing the machine learning based tele-monitoring solution for bearing data of CTI project 26177.1 PFIW-IW and adapting it to gearbox data



## Main partners and project manager

Project manager

Dr Rudolf Tanner

Main research partner

Mechmine LLC (GmbH)

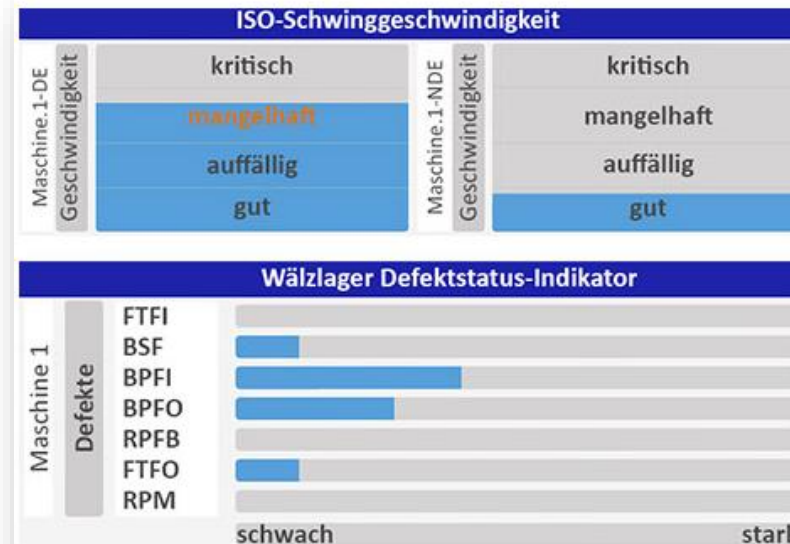
Professor Dr Guido Schuster

Main implementation partner

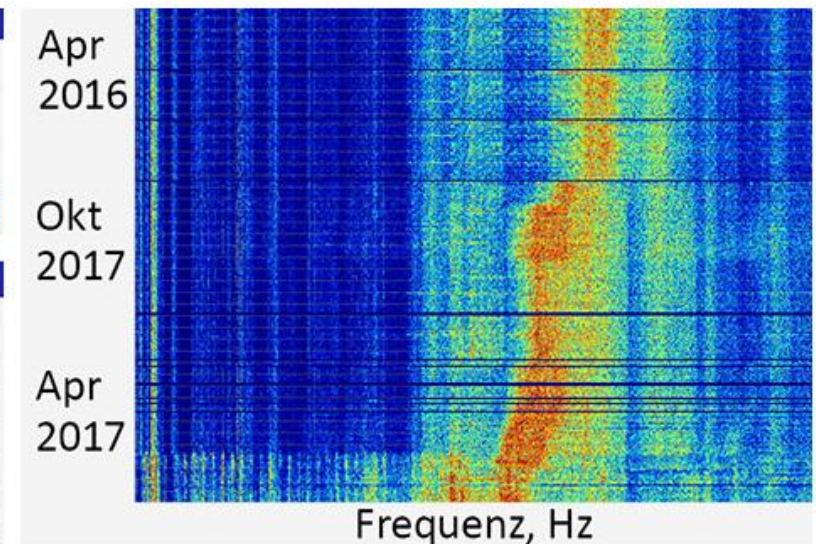
HSR Hochschule Rapperswil

Dr Rudolf Tanner

Mechmine LLC (GmbH)



Dashboards

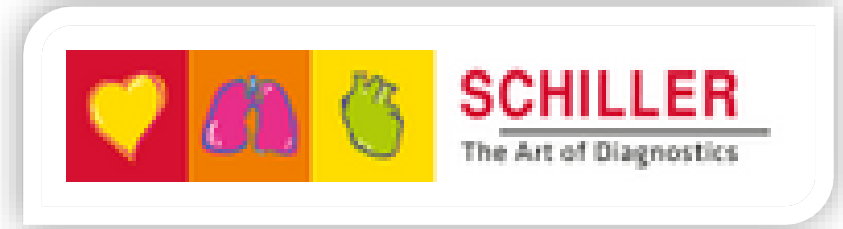


Frühzeitige Erkennung von Anomalien

# Deep Learning for ECG Analysis

Application Number: 36433.1 IP-LS

Application Title: Data-driven Electrocardiogram Interpretation



## Main partners and project manager

Project manager

Ramun Schmid

SCHILLER AG

Main research partner

Professor Dr Guido Schuster

HSR Hochschule Rapperswil

Research partner

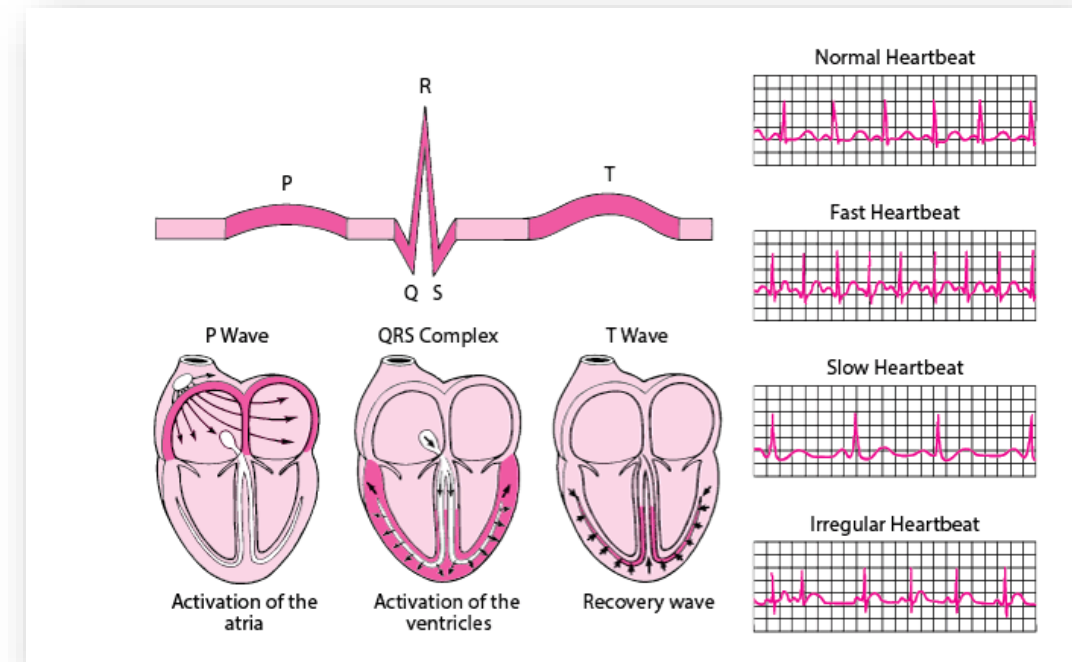
Professor Dr Christian Mueller

Universitätsspital Basel

Main implementation partner

Ramun Schmid

SCHILLER AG



# ML for Injection Moulding Control

## SUBVENTIONSVERTRAG

Innovationsprojekt 29621.1 IP-ENG

Zwischen der **Innosuisse – Schweizerische Agentur für Innovationsförderung**  
(nachstehend **Beitragsgeberin** genannt)

und den folgenden  
Projektpartnern:

Forschungspartner:

**HSR Hochschule für Technik Rapperswil**  
(nachstehend **Empfänger**)

Umsetzungspartner:

**Kistler Instrumente AG**

**Netstal-Maschinen AG**

**Geberit International AG**

**Weidmann Medical Technology AG**

**Krauss Maffei Schweiz AG**

betreffend

**Machine Learning basiertes Prozessmanagementsystem zur  
Optimierung des Spritzgiessprozesses**



## Data Driven Injection Moulding

Curdin Wick<sup>(✉)</sup>, Frank Ehrig, and Guido Schuster

University of applied science Rapperswil, Rapperswil SG, Switzerland  
{curdin.wick, frank.ehrig, guido.schuster}@hsr.ch

**Abstract.** The injection moulding process for the production of plastic parts is a very complex process. Therefore, a lot of experience and expert knowledge is necessary to produce parts with high quality. Changes in granule-batches, environmental influences and wear of the machine and the mould can strongly affect the quality of the produced parts. For this reason an injection moulding machine needs an experienced operator, who reacts properly to changing input variables and sets appropriate countermeasures. Modern injection moulding machines are able to record all countermeasures and have access to a wealth of internal machine data. Consequently, an adequate machine learning (ML) method should be able to observe, to learn the proper countermeasures and to evaluate their effectiveness. With deep learning (DL), a state of the art technology in ML, it will be possible to predictively detect process anomalies for the first time, based only on the knowledge about the internal machine data. If an operator changes the setting parameters of the injection moulding machine, the correlation between the adjustment and the anomaly is being learnt. The aim is to get process adjustment recommendations from the machine learning system.

This is a fundamentally new approach for process management in injection moulding, as the machine learning system detects problems long before they can be seen by an operator. Furthermore, the system provides process adjustment recommendations, based on the supervised and automatically generalized actions from different operators using different injection moulding machines, moulds and materials.

**Keywords:** Injection moulding · Machine learning · Process anomalies

# Embedded Computer Vision for Predictive Maintenance

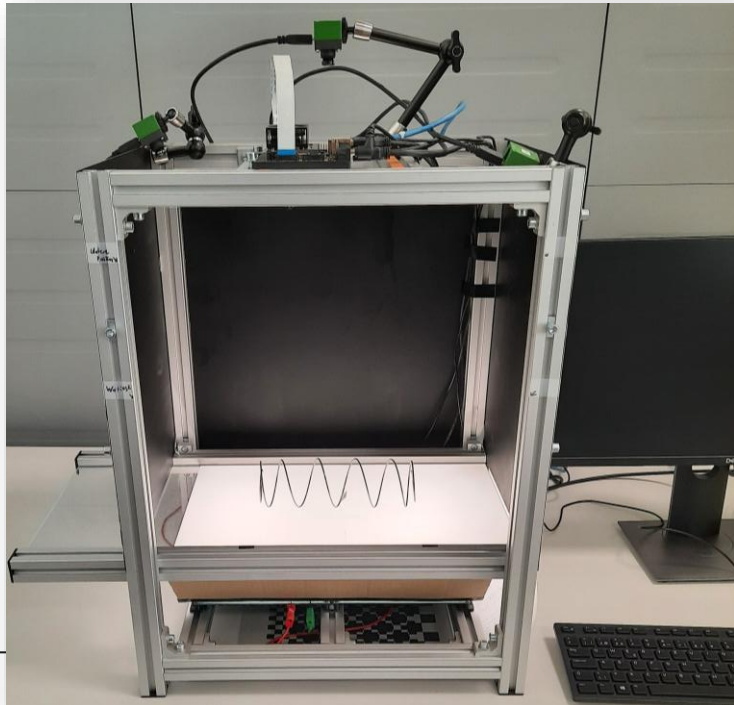
SPÜHL

University of St.Gallen

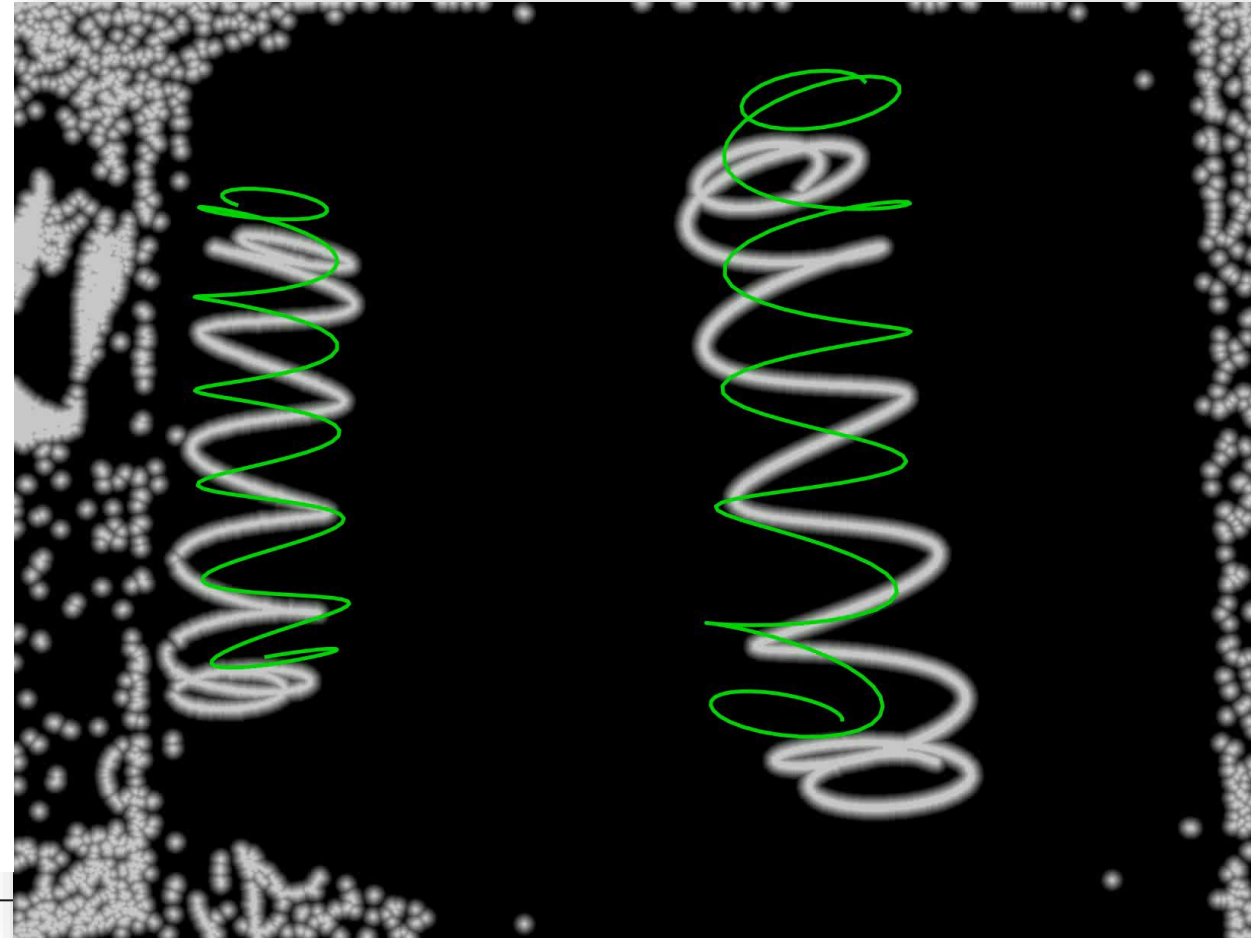
Application Number: 39689.1 IP-SBM

Application Title: Novel Digital Services for Highly Dynamic Manufacturing Machines

Main partners and project manager



Professor Dr Thomas Friedli  
Universität St. Gallen  
Professor Dr Thomas Friedli  
Universität St. Gallen  
Professor Dr Roman Hänggi  
HSR Hochschule Rapperswil  
Professor Dr Guido Schuster  
HSR Hochschule Rapperswil  
Rupert Mayenberger  
Spühl GmbH  
Dr Philipp Gallus  
Baumann Springs Ltd.  
Julian Pandle  
Wafios AG  
Roger Hepp  
Siemens Schweiz AG, Digital Factory



# 3D Spring Shape Modeling and Measuring System

- Spühl



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## FUNDING AGREEMENT

Innovation project 59295.1 IP-ENG

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between

**Innosuisse – Swiss Innovation Agency**  
(hereinafter referred to as **Contributor**)

and the following  
project partners:

Research partners:

**OST - Ostschweizer Fachhochschule**  
(hereinafter referred to as **Recipient**)

Implementation partners:

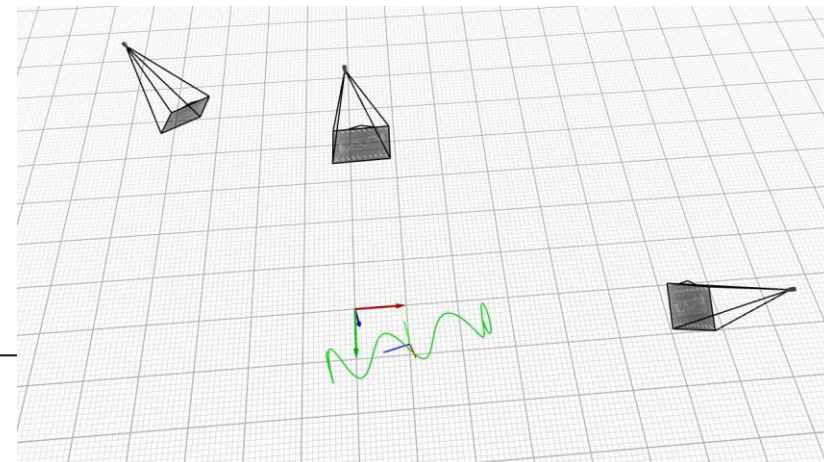
**Spühl GmbH**

relating to

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**Novel Automatic 3D Spring Shape Modeling and Measuring System**

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# AI based Condition Monitoring using Drones



Application Number: 52765.1 IP-EE

Application Title: CURO: Automatische Zustandsüberwachung und vorausschauende Wartung für Hochspannungsleitungen mittels automatisierten Drohnen und künstlicher Intelligenz

## Main partners and project manager

Project manager

Lorenzo Arizzoli-Bulato

LINIA GmbH

Main research partner

Professor Dr Guido Schuster

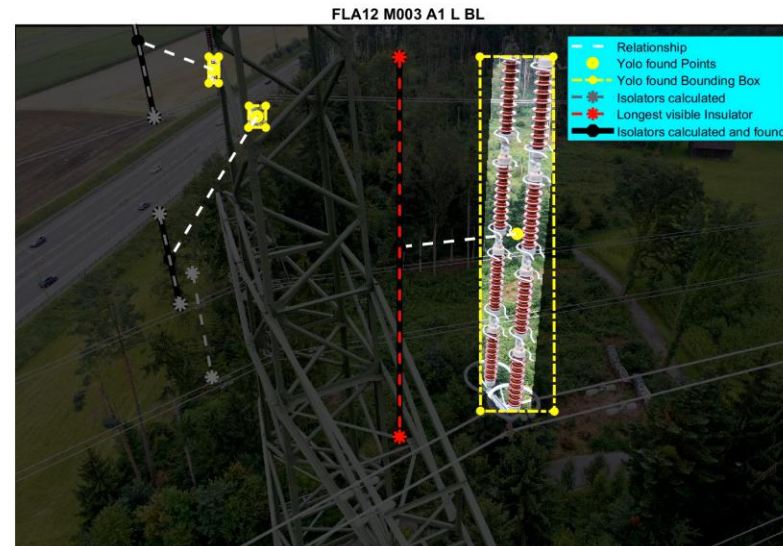
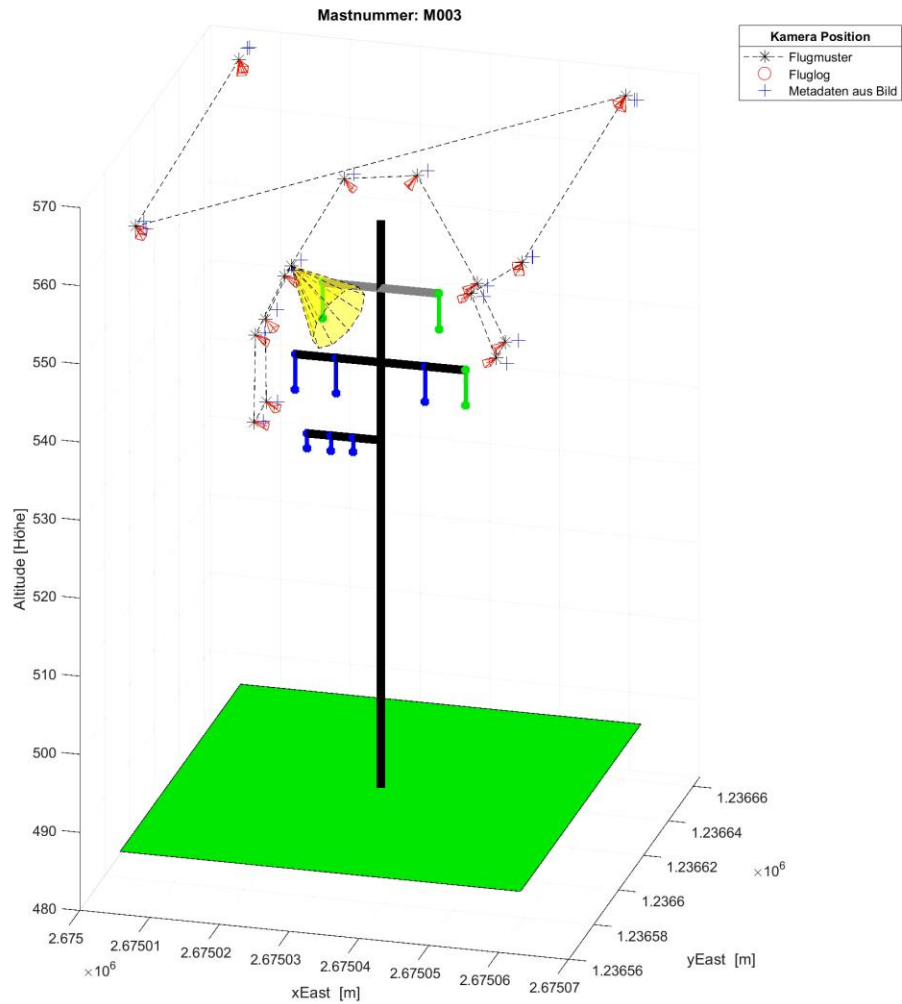
OST - Ostschweizer Fachhochschule

Main implementation partner

Lorenzo Arizzoli-Bulato

LINIA GmbH

# AI based Condition Monitoring using Drones



# AI based Condition Monitoring using Drones



## Axpo übernimmt Spezialsoftware-Firma LINIA

 Share

Netze

Unternehmen

**08.04.2024 - Per 1. April 2024 hat Axpo die Software-Firma LINIA übernommen. Die Übernahme ermöglicht Axpo ein einzigartiges Full-Service-Angebot im Dienstleistungsbereich der automatisierten Stromnetzinspektion und den Zugang zu neuen Märkten.**

Bereits seit mehreren Jahren arbeiten Axpo und LINIA bei der automatisierten Befliegung von Stromleitungen und Datenauswertung zusammen. Nun hat Axpo das Unternehmen per 1. April 2024 übernommen. LINIA wird in den kommenden Monaten in die Tochtergesellschaft Axpo Grid integriert, um den Kunden einen noch besseren Service aus einer Hand anzubieten. Axpo unterstreicht mit dieser Transaktion ihre Ambitionen als Anbieterin von innovativen Lösungen und ihr Engagement im Startup-Bereich in der Schweiz. Die Marke LINIA bleibt auch nach der Übernahme erhalten und wird gegenüber den Kunden weiterverwendet. Über die finanziellen Bedingungen der Transaktion wurde Stillschweigen vereinbart.

Keyvan Shokoofh, Head of Sales & Market bei Axpo Grid sagt: «Mit der Übernahme von LINIA als ausgewiesene Spezialistin in der automatisierten Stromnetzinspektion erweitern wir unser Lieferumfang und erreichen eine einzigartige Produkttiefe.»

Lorenzo Arizzoli-Bulato, LINIA-Mitgründer und Geschäftsführer, ergänzt: «Die nun noch engere Zusammenarbeit mit einer dynamischen und innovativen Akteurin wie Axpo bietet ideale Voraussetzungen, die LINIA-Software und -Dienstleistungen weiterzuentwickeln und zu vermarkten.»

LINIA ist ein vor sechs Jahren gegründetes Schweizer Startup. Mit integrierten Softwarelösungen ermöglicht LINIA einen digitalisierten Inspektionsprozess, der die Inspektionsqualität, -geschwindigkeit und -sicherheit bedeutend erhöht und dabei die Kosten und CO2-Emissionen reduziert.

# Nondestructive Testing of Plastic Welds

- +GF+



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## FUNDING AGREEMENT

Innovation project 59297.1 IP-ICT

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between **Innosuisse – Swiss Innovation Agency**  
(hereinafter referred to as Contributor)

and the following  
project partners:

Research partners:

**OST - Ostschweizer Fachhochschule**  
(hereinafter referred to as Recipient)

Implementation partners:

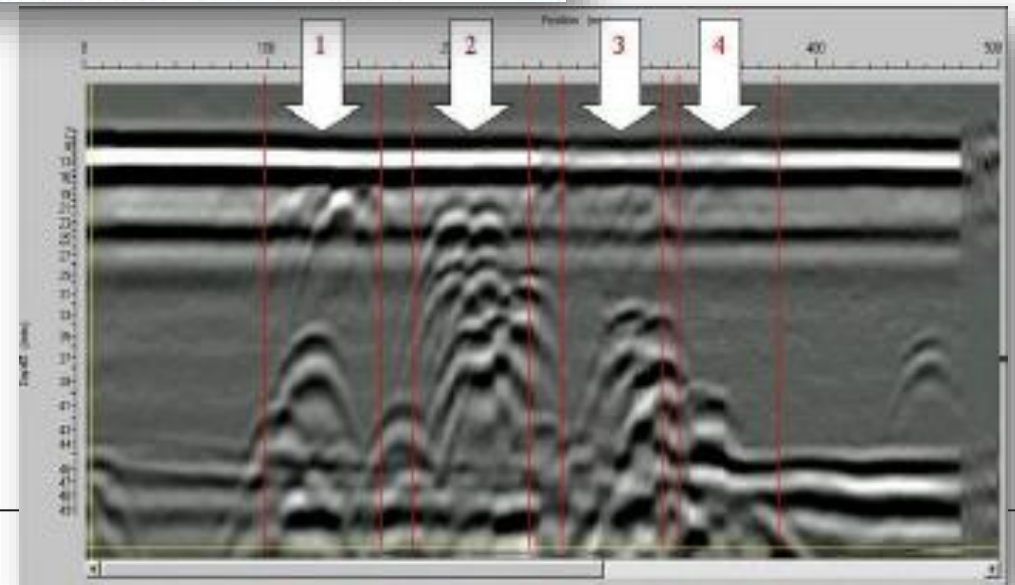
**Georg Fischer Piping Systems Ltd.**

relating to

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**Automatic Nondestructive Testing (NDT) of Plastic Welds  
based on Ultrasonic Imaging and Computer Vision (CV)**

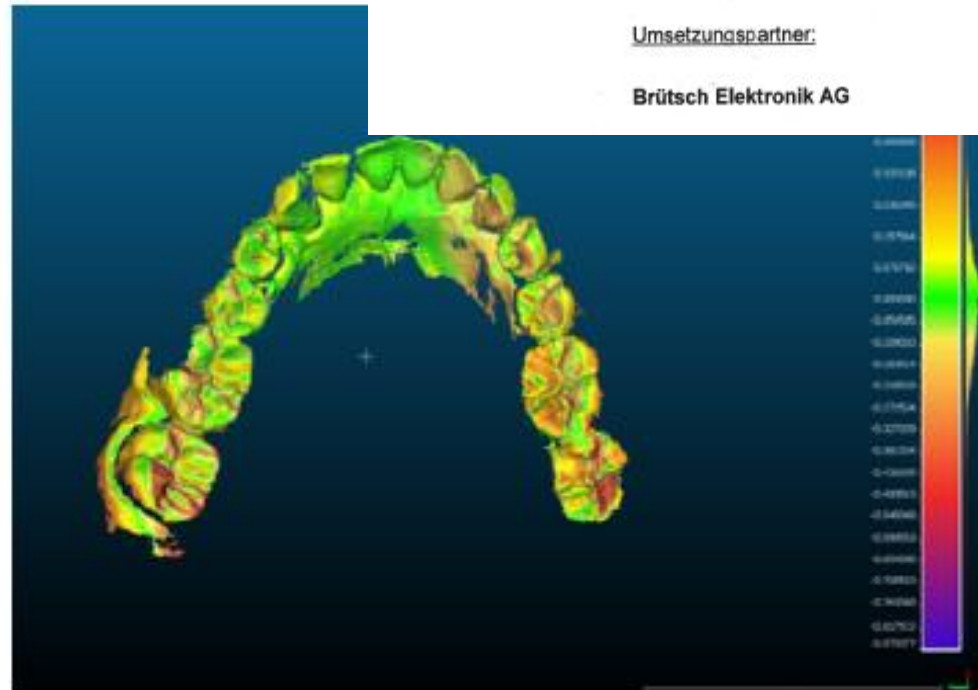
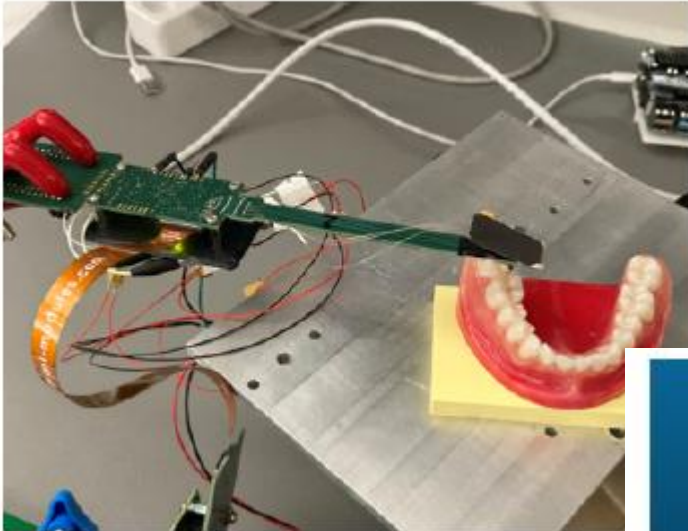
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# Intraoral Scanner

- Brütsch Elektronik

Testaufbau mit integrierten DOE



## SUBVENTIONSVERTRAG

Innovationsprojekt 59691.1 IP-ENG

Zwischen der **Innosuisse – Schweizerische Agentur für Innovationsförderung**  
(nachstehend **Beitragsgeberin** genannt)

und den folgenden  
Projektpartnern:

Forschungspartner:

**ZHAW - Zürcher Hochschule für Angewandte Wissenschaften**  
(nachstehend **Empfänger**)

**OST - Ostschweizer Fachhochschule**

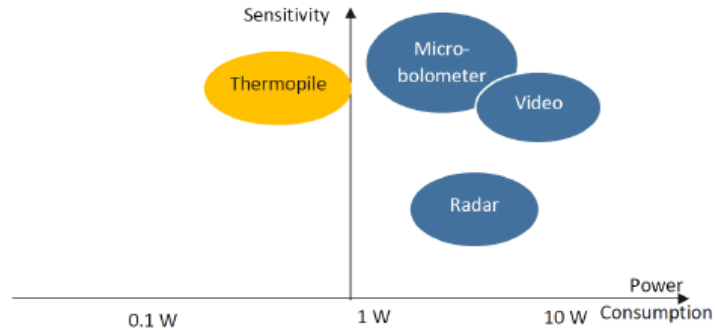
Umsetzungspartner:

**Brütsch Elektronik AG**

brütsch

# Solar powered Pedestrian/Bicycle Detection/Counting System based on low-power and low-cost Thermopile Arrays AI & CV

- ADEC



## FUNDING AGREEMENT

Innovation project 102.568 IP-ENG



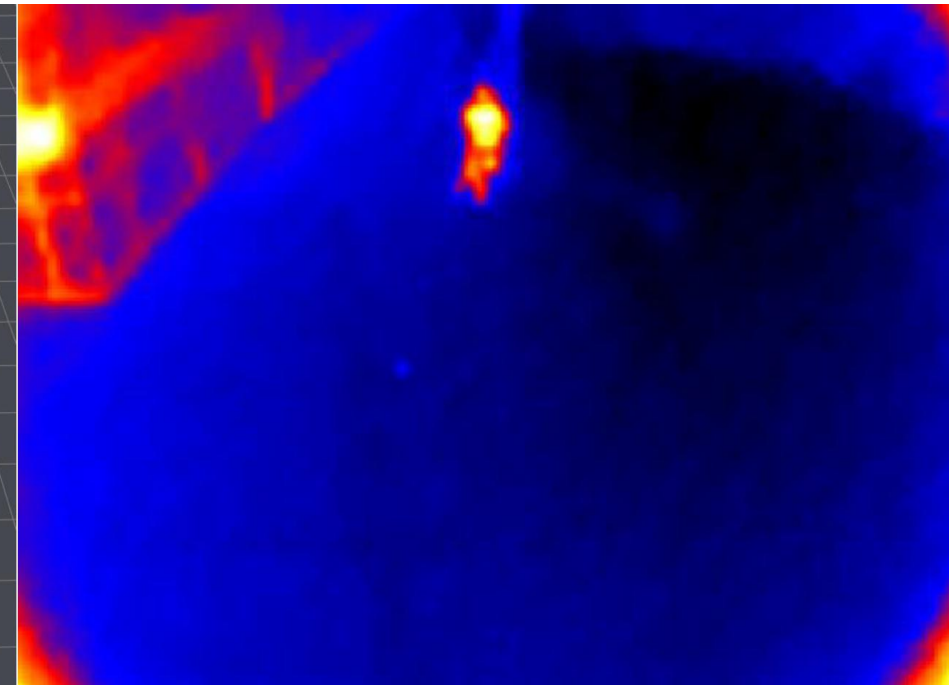
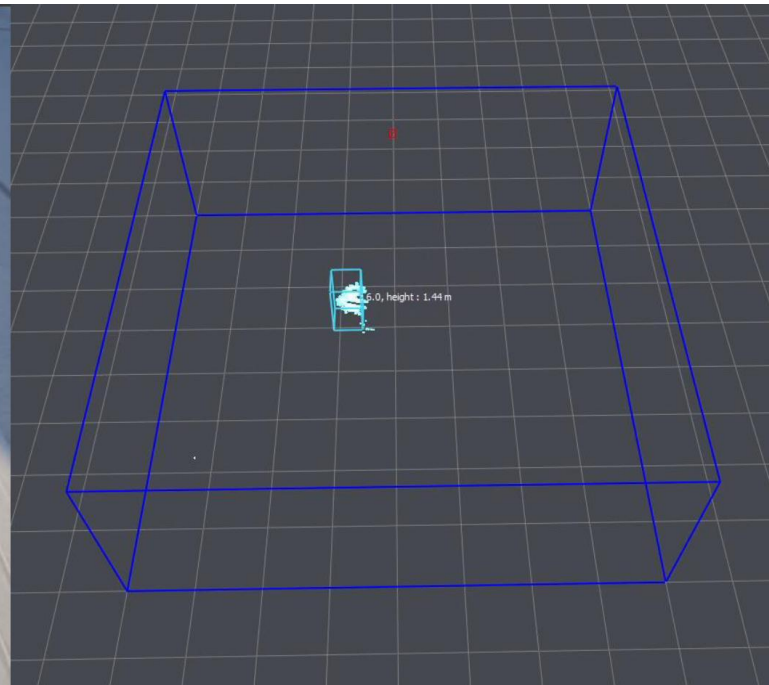
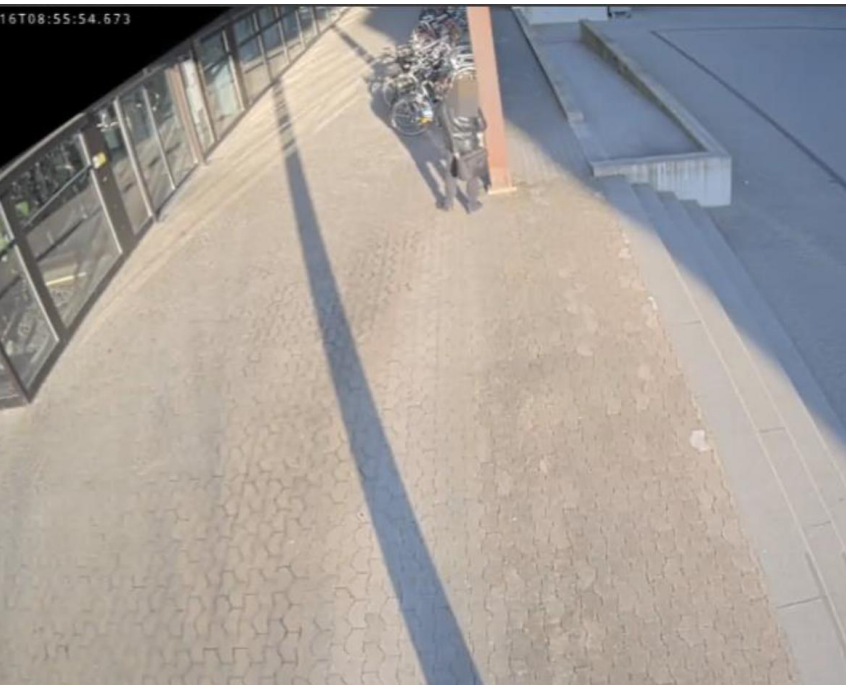
between **Innosuisse – Swiss Innovation Agency**  
(hereinafter referred to as Contributor)

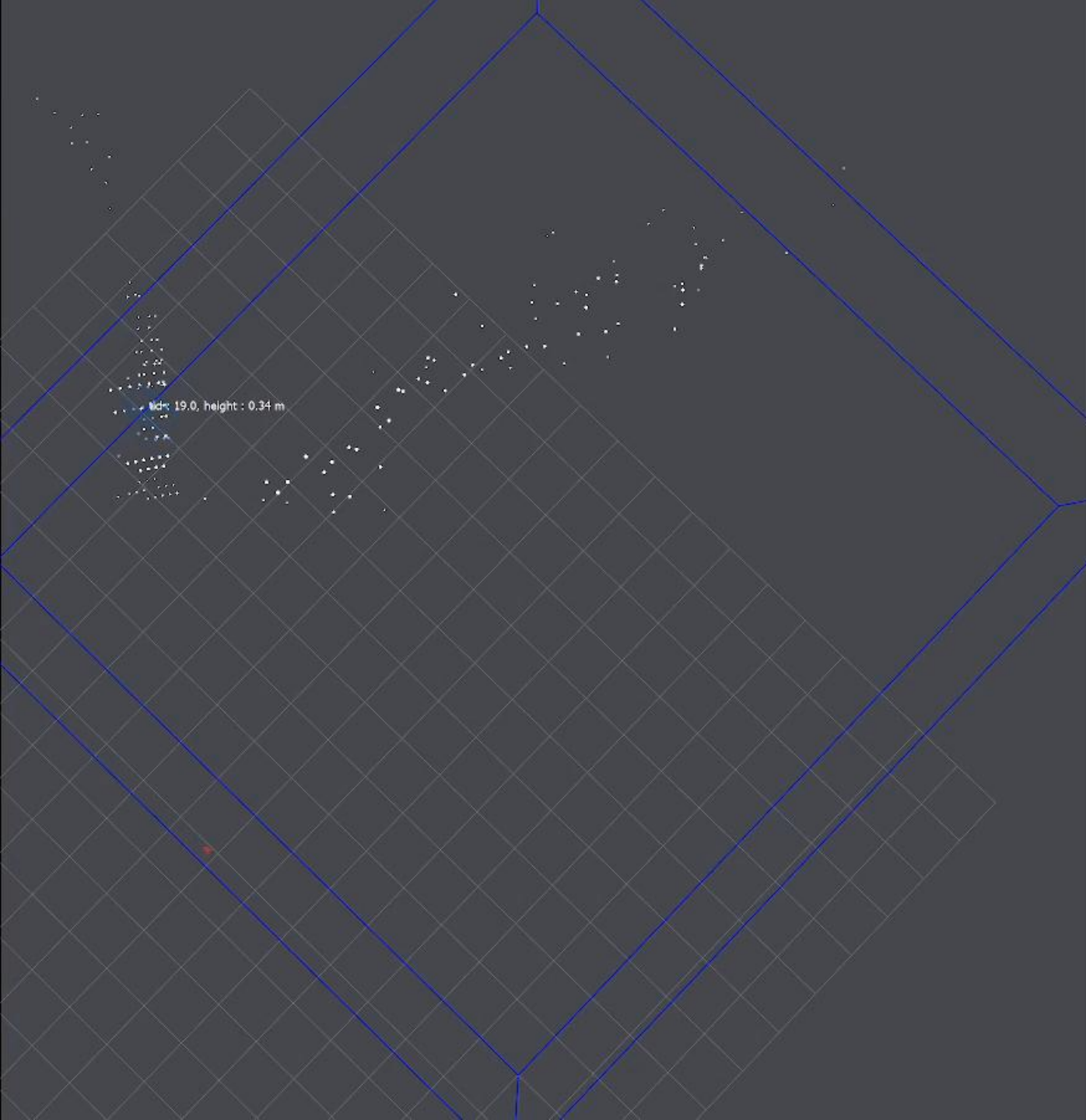
- Joint project with the IRAP @ RJ

and the following  
project partners:

Research partners:

OST - Ostschweizer Fachhochschule





# Low-cost and autarkic Water Quality Measurement and Early Warning System for Drinking Water Utilities based on IoT Technologies and Machine Learning

- Rittmeyer



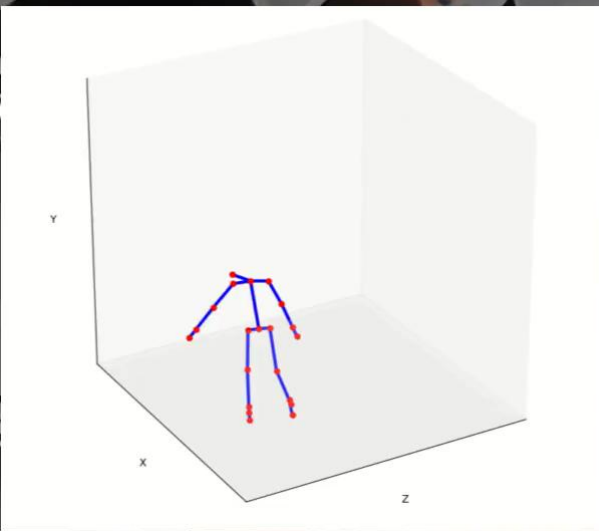
- Joint project with the UMTEC @ RJ

# Executive Functions Training (EFT) System based on Real-Time Computer Vision (CV) and Video Projection (VP)

- **Lakers Sport**



- Joint project with  
Physiotherapy @ SG



# VR Helicopter Simulator

## Erster Virtual-Reality-Simulator EASA-qualifiziert

Das aus dem Labor des Interdisciplinary Center for Artificial Intelligence (ICAI) hervorgegangene Unternehmen VRM Switzerland hat den ersten Helikopter-Flugsimulator entwickelt, der vollständig auf Virtual Reality (VR) basiert und von der Europäischen Agentur für Flugsicherheit (EASA) anerkannt ist.



## History [\[edit\]](#)

Loft Dynamics was launched as VRM Switzerland in 2016. It was founded by Fabi Riesen, a Swiss electrical engineer and private pilot, who is also the CEO of the company.<sup>[7]</sup> It is based in [Dübendorf](#), a suburb of [Zurich](#).<sup>[1]</sup> The technology was developed at the [Institute for Artificial Intelligence \(ICAI\) at the Eastern Switzerland University of Applied Sciences](#).<sup>[8]</sup> Riesen worked in collaboration with [Air Zermatt](#), and launched the simulators initially with Mountainflyers and the Heli Academy.<sup>[9]</sup> Riesen stated that the goal of the company was to "make an affordable, realistic training device that removes the danger involved in actual flight training".<sup>[10]</sup>

# Evidence based Training System for Helicopter Pilots

- Loft Dynamics

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## FUNDING AGREEMENT

Innovation project 59296.1 IP-ICT

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between **Innosuisse – Swiss Innovation Agency**  
(hereinafter referred to as Contributor)

and the following  
project partners:

Research partners:

**OST - Ostschweizer Fachhochschule**  
(hereinafter referred to as Recipient)

Implementation partners:

**VRMotion AG**

relating to

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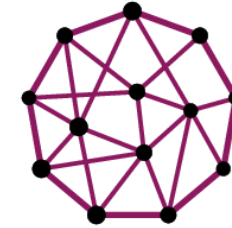
**Evidence Based Training (EBT) System for Helicopter Pilot Training utilizing the only EASA qualified VR Helicopter Simulator in the world and Statistical Machine Learning**

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# Übersicht

- Abschluss: **Certificate of Advanced Studies in Artificial Intelligence**
- Schwerpunkte: AI-Grundlagen, Business Anwendungen, Eigener Case
- Nutzen: **Sie verstehen die technischen und wirtschaftlichen AI-Grundlagen und erwerben die Kompetenzen, eine AI-Führungsrolle zu übernehmen**
- ECTS: 15 ECTS
- Kosten: 9900 CHF → inklusiv Unterrichtsmaterial (Bücher & PPT)
- Zulassung: Anerkannter Tertiärabschluss, mehrjährige qualifizierte Berufserfahrung, Tätigkeit in einem entsprechenden Arbeitsfeld, gute Englischkenntnisse, «sur dossier»
- Ort: Campus Rapperswil-Jona
- Durchführung: **Herbst 2026 (Herbst 2025 ist ausgebucht)**



ICAI

