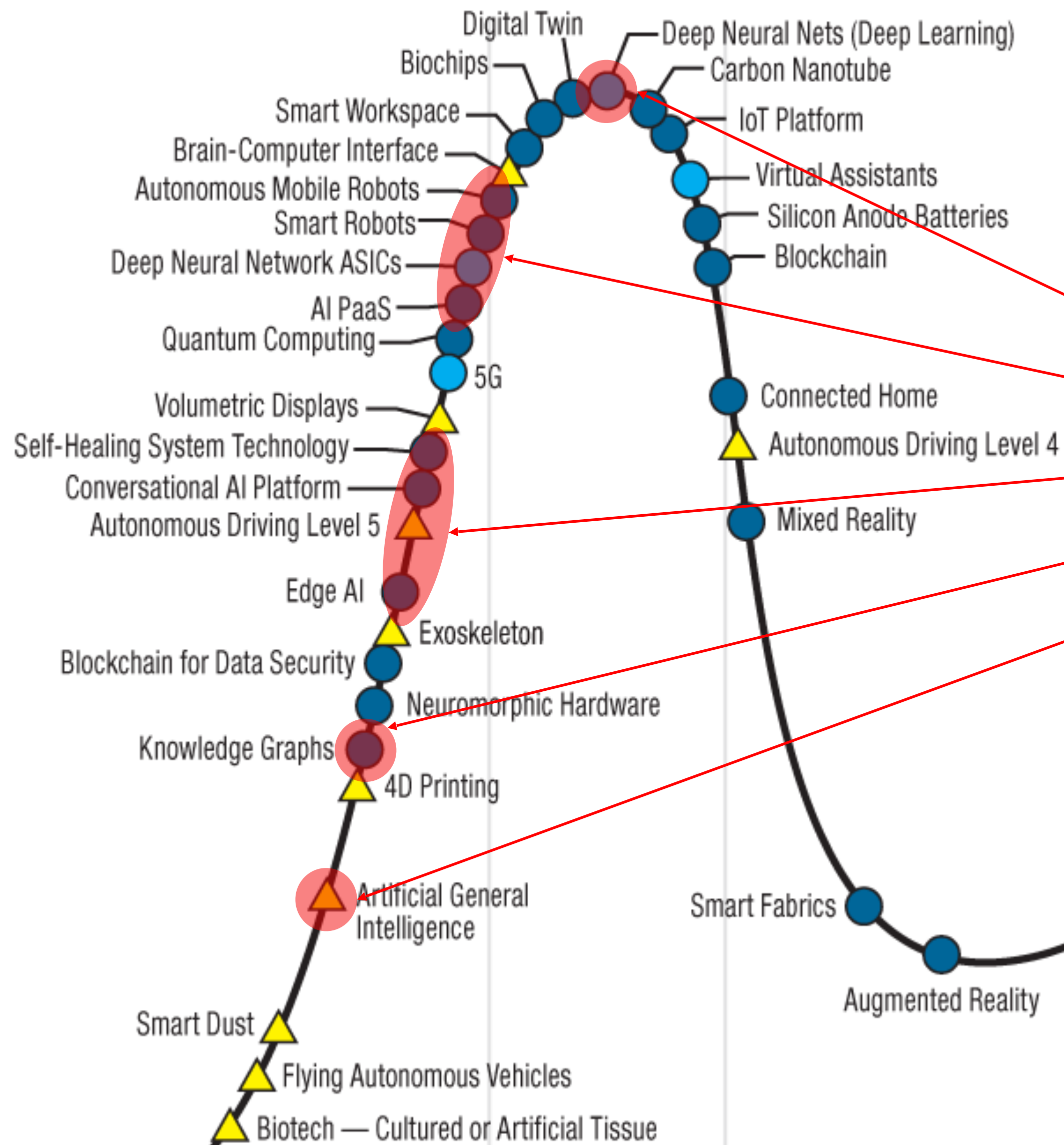


AI & ML - Wohin geht die Reise?



Expectations



Plateau will be reached in:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- more than 10 years

KI & Data Science

As of August 2018

Innovation Trigger

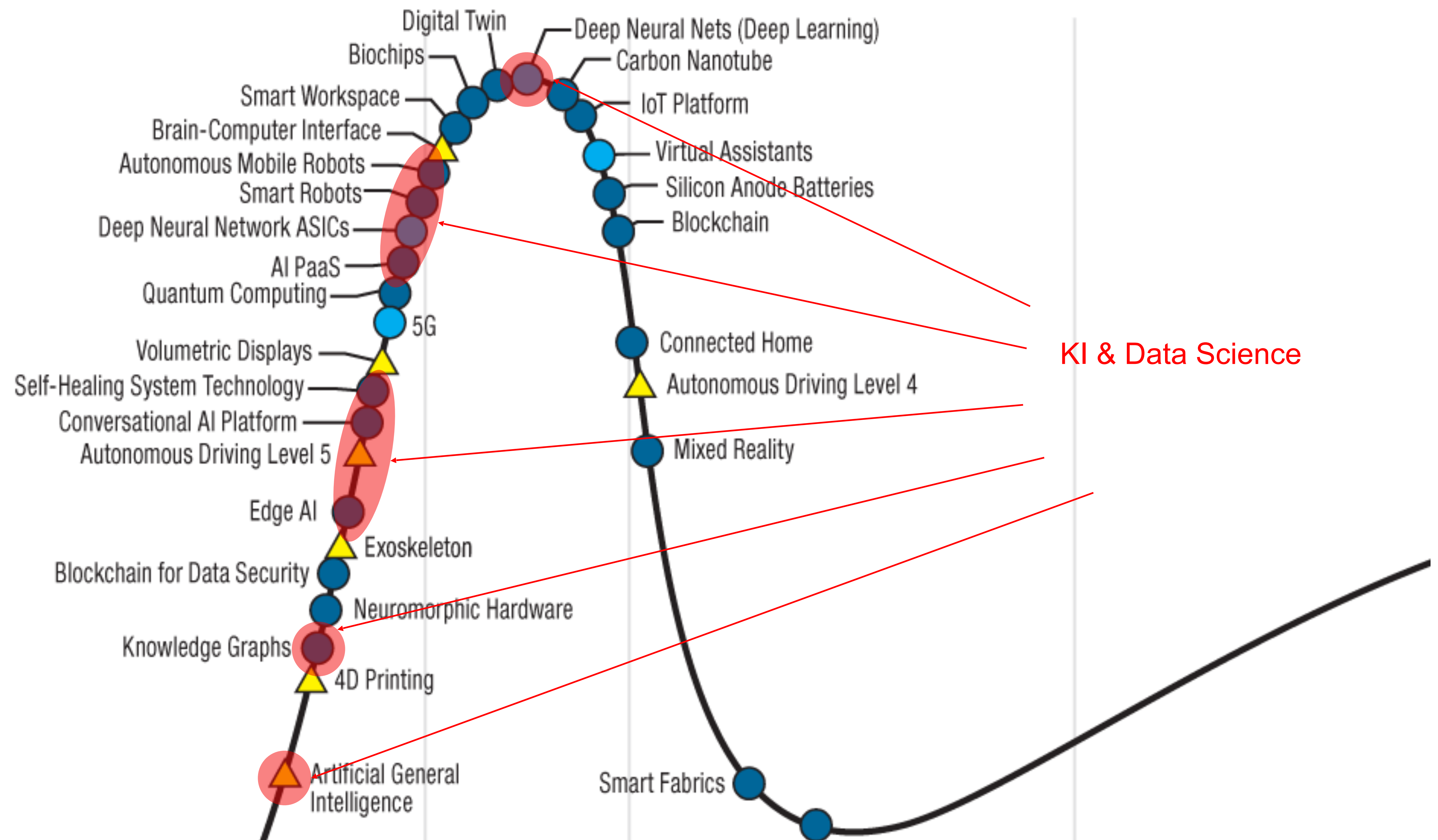
Peak of Inflated Expectations

Trough of Disillusionment

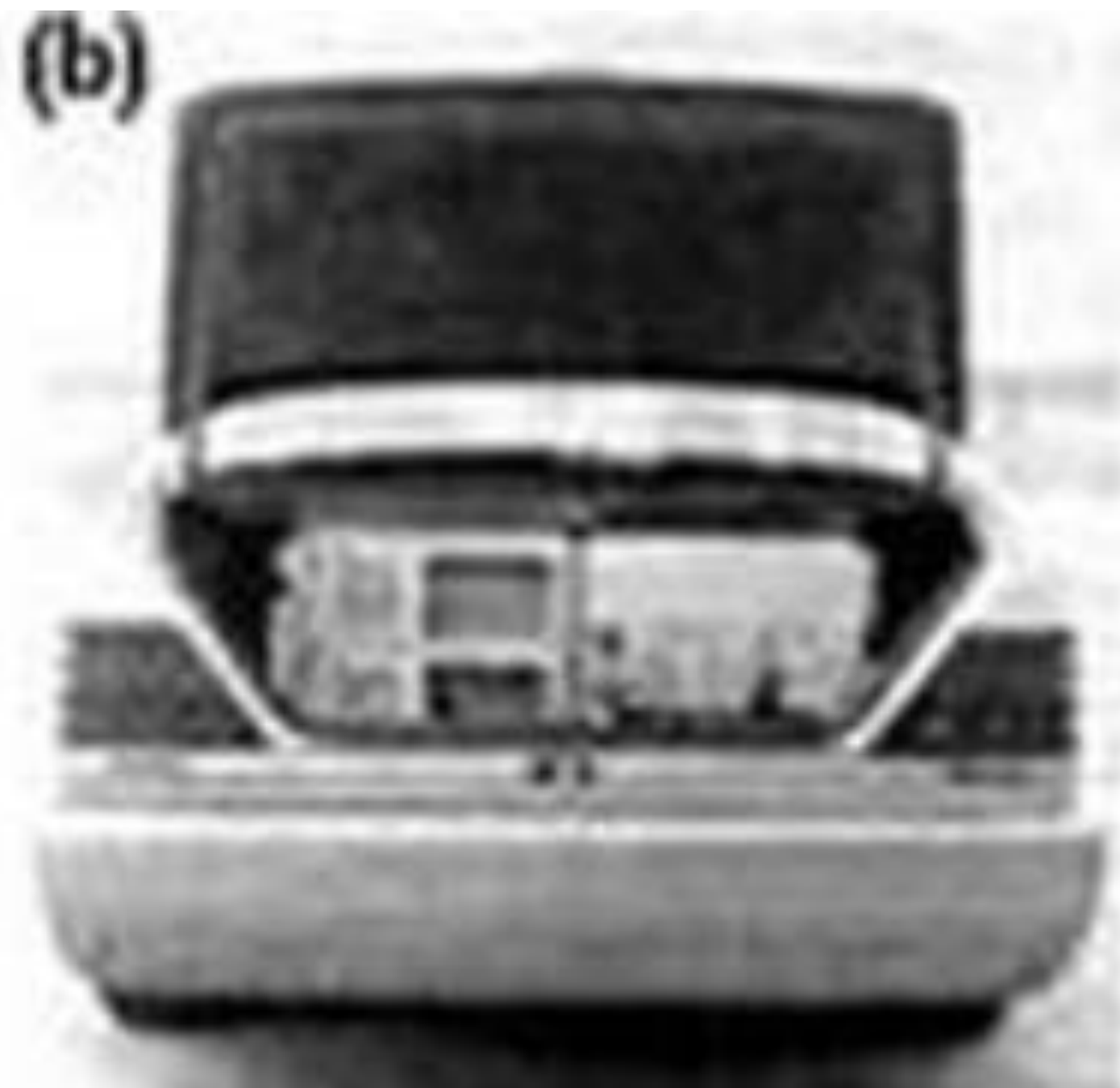
Slope of Enlightenment

Plateau of Productivity

Expectations



KI & Data Science



Projekt PROMETHEUS: driver-less cars
1987-1995

Lenkung und Fahrspurregelung
mittels eines neuronalen Netzwerks.

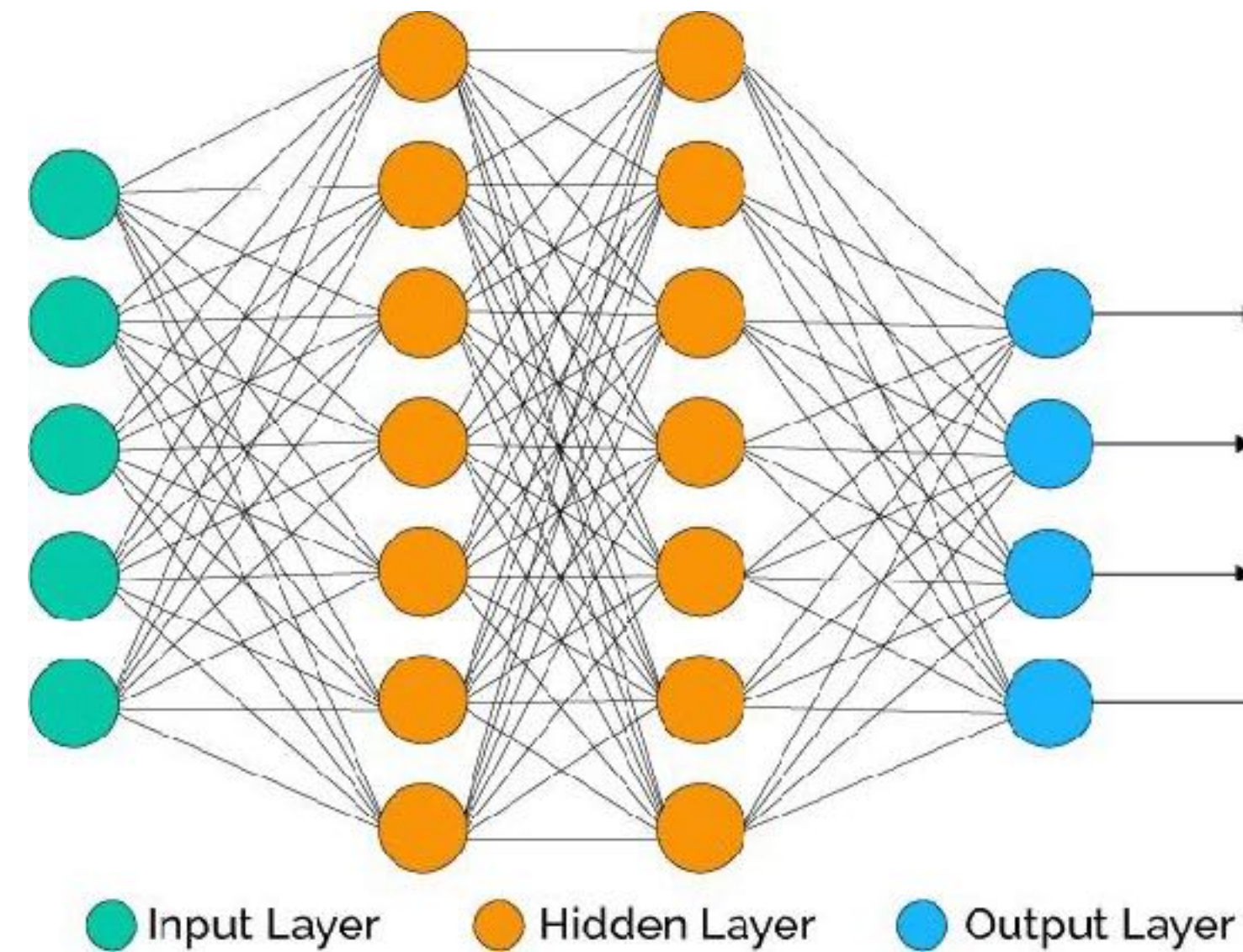


NLP mit Deep Learning



**Großes Datenvolumen
in hoher Qualität**

z.B. WebTex 40GB



**DL Architektur und
Algorithmen**

z.B. 17 Milliarden Parameter



Rechenleistung

2-petaFLOPS

DGX-2 GPU Cluster

GPU Power

2-petaFLOPS: zweitausend Millionen Millionen 10^{15} Fließkomma-Operationen pro Sekunde.

2-petaFLOPS = Wenn jeder Mensch auf der Erde 265 Taschenrechner hätte und mit jedem davon gleichzeitig eine Fließkommaberechnung in einer Sekunde durchführen würde.

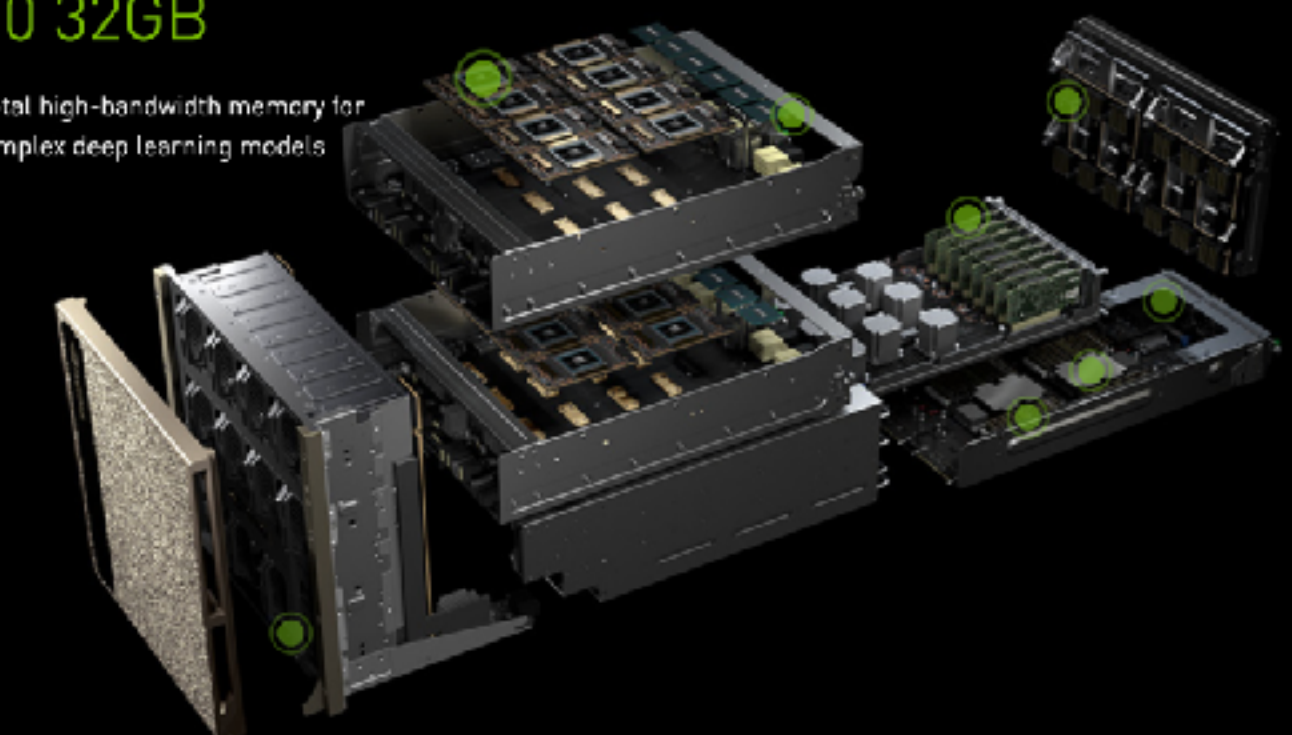
Die Rechenzeit für eigene Experimente wurde von 1 Monat auf 1 Tag reduziert.

- 16 GPUs
(Tesla V100 with 32 GB)
- 2 XENON CPUs
- 1.5 TB RAM
- 30 TB SSD

Gut für lineare Algebra und Vektorraummodelle, wie z.B. tiefes Lernen

**16X FULLY
CONNECTED TESLA
V100 32GB**

0.5 TB total high-bandwidth memory for more complex deep learning models



Neuronale Sprachverarbeitung

Wortähnlichkeiten

Word embeddings

Grammatik, Sätze, Nebensätze:

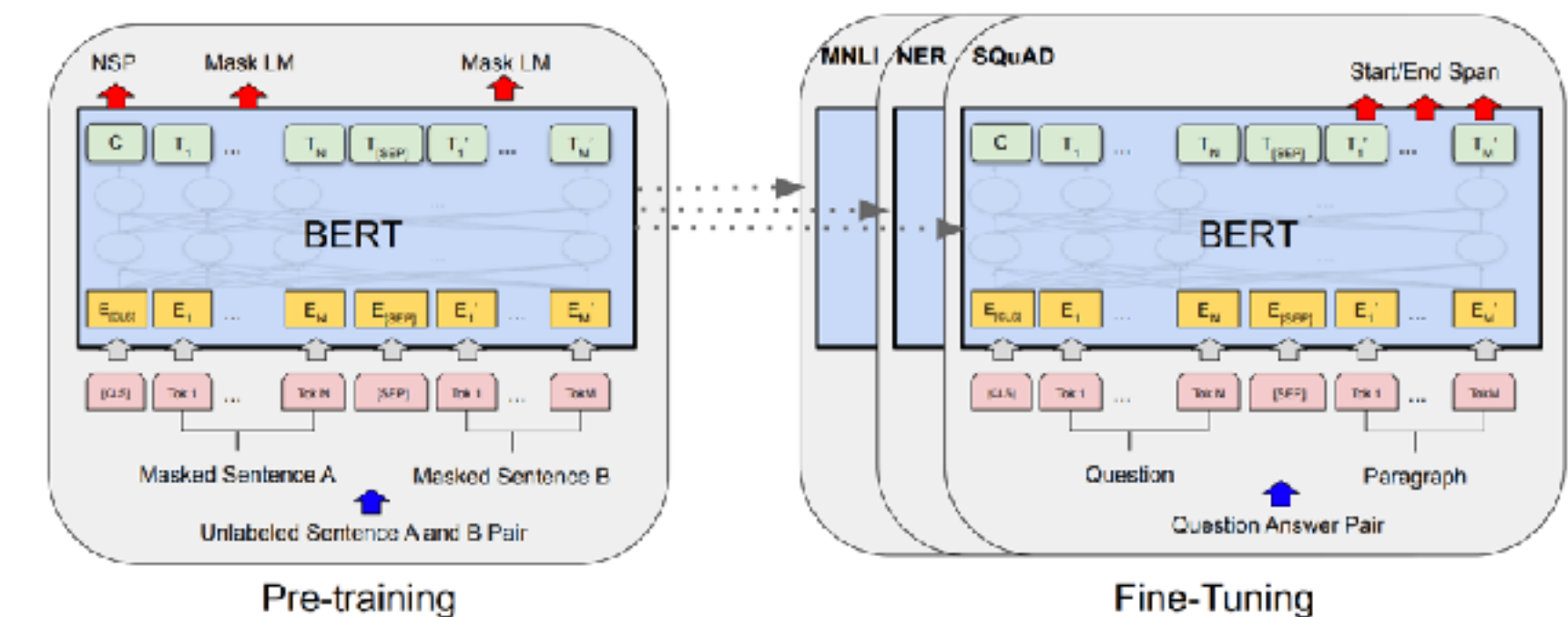
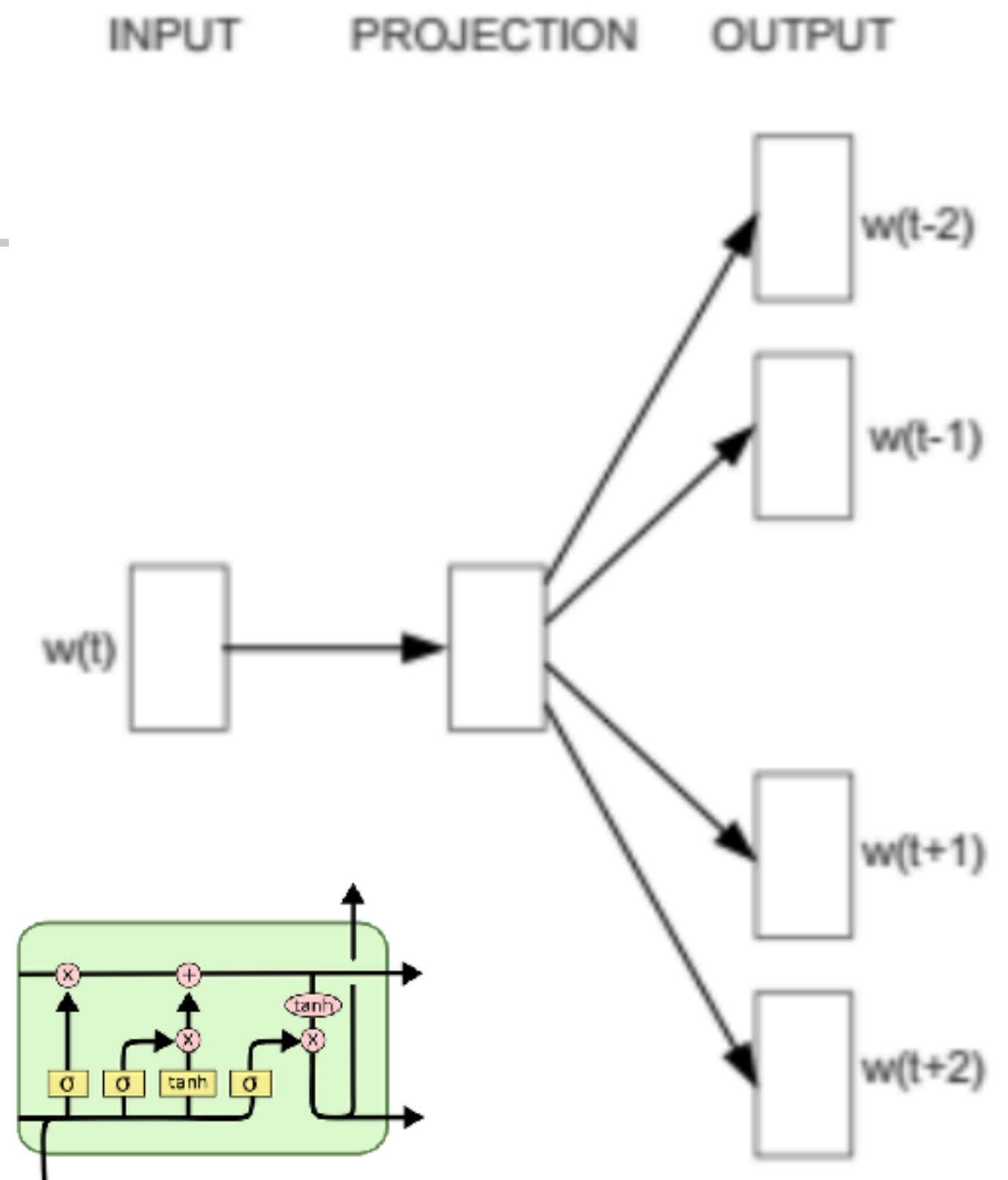
Neural Networks for NLP (RNNs, CNNs, LSTMs)

Maschinelles Übersetzen:

Sequence-to-Sequence & Attention

Leseverstehen/Sprachmodelle:

Transformer. Per-trained language models with Language model embeddings (BERT)





This research project is about conversational AI, |

a new approach to the design and evaluation

a research area of artificial intelligence that is

which is a type of AI that works

This research project is about conversational AI, a research area of artificial intelligence that is



This research project is about conversational AI, a research area of artificial intelligence that is about algorithms to understand natural language. |

The project is an

In this paper, I will

Our initial focus was

This research project is about conversational AI, a research area of artificial intelligence that is about algorithms to understand natural language. We aim to build a chatbot |

that can learn, think

that is conversational on

that can be intelligent,

This research project is about conversational AI, a research area of artificial intelligence that is about algorithms to understand natural language. We aim to build a chatbot that is conversational on legal topics.

The research team is led

To learn more

In this research

This research project is about conversational AI, a research area of artificial intelligence that is about algorithms to understand natural language. We aim to build a chatbot that is conversational on legal topics. In this research we aim to answer questions based on |

the legal issues

existing legal materials

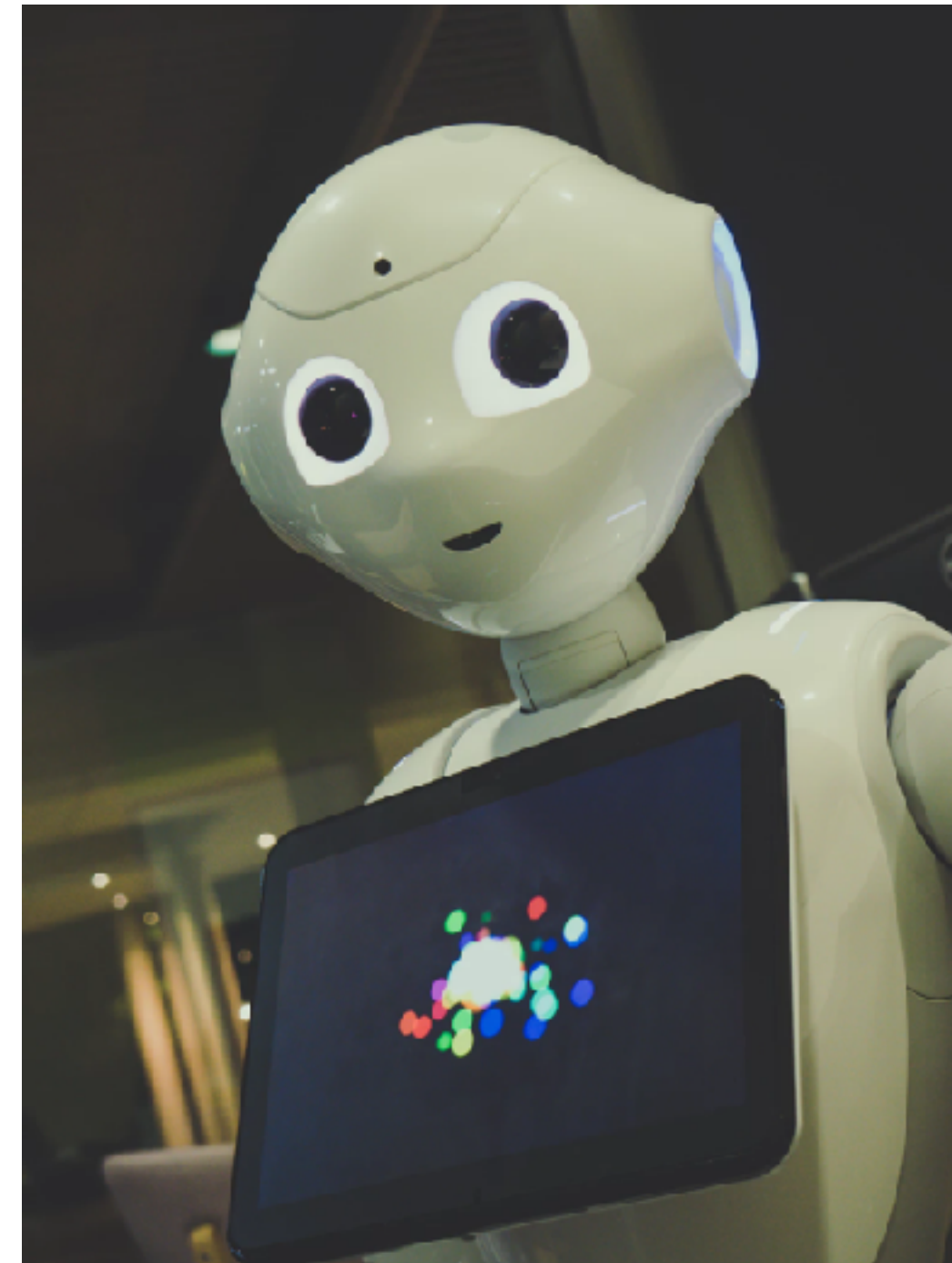
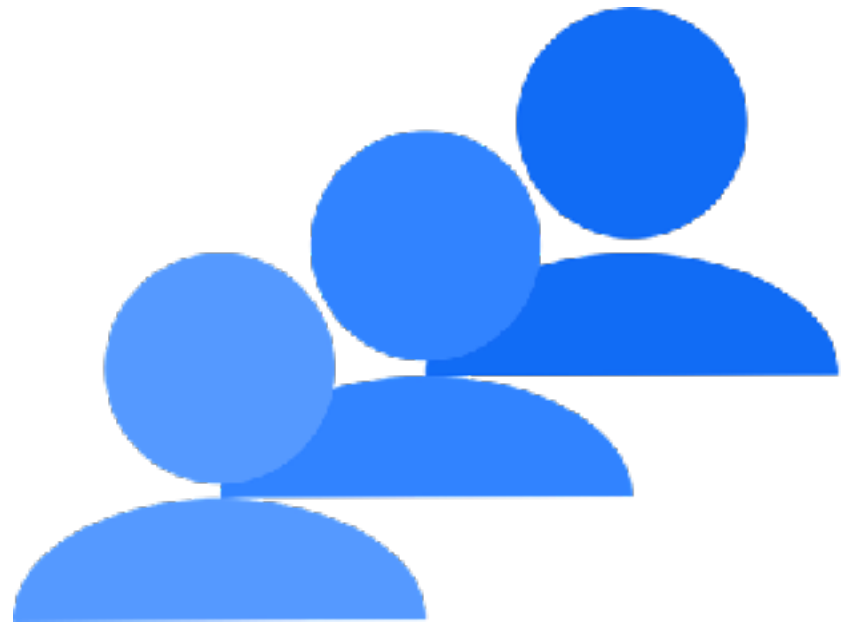
the user's

Chatbots (Conversational AI)

Companies similar to halliburton?

What is the capital of Canada?

How many inhabitants does Zurich have?





What is your country?

Must intercompany agreements be renewed or revised in a certain time frame in order to be valid?

Switzerland

No, intercompany agreements must not be renewed or revised in a certain time frame

Interactive Chatbots

Grüezi



**Talk in
Swiss German**



Pronunciation and writing not standardized, varies according to dialect and speaker/author

Data collection of annotated sound data (minimal training data)

Two language models

Transcription in Swiss German
transcription in written German

Pseudophonic writing style

Example:

{Ich chume hüüt echli spöter, wil ich de Zug verpasst han.} (ZH)

{I chom hüt achli spööter, wäli dä Zug vopasst ha.} (SG)

Swiss written German with Swiss grammar

"Peter arbeitete gestern bis in die Nacht."

→ "Der Peter hat gestern bis in die Nacht geschafft."

Normalized Swiss-German

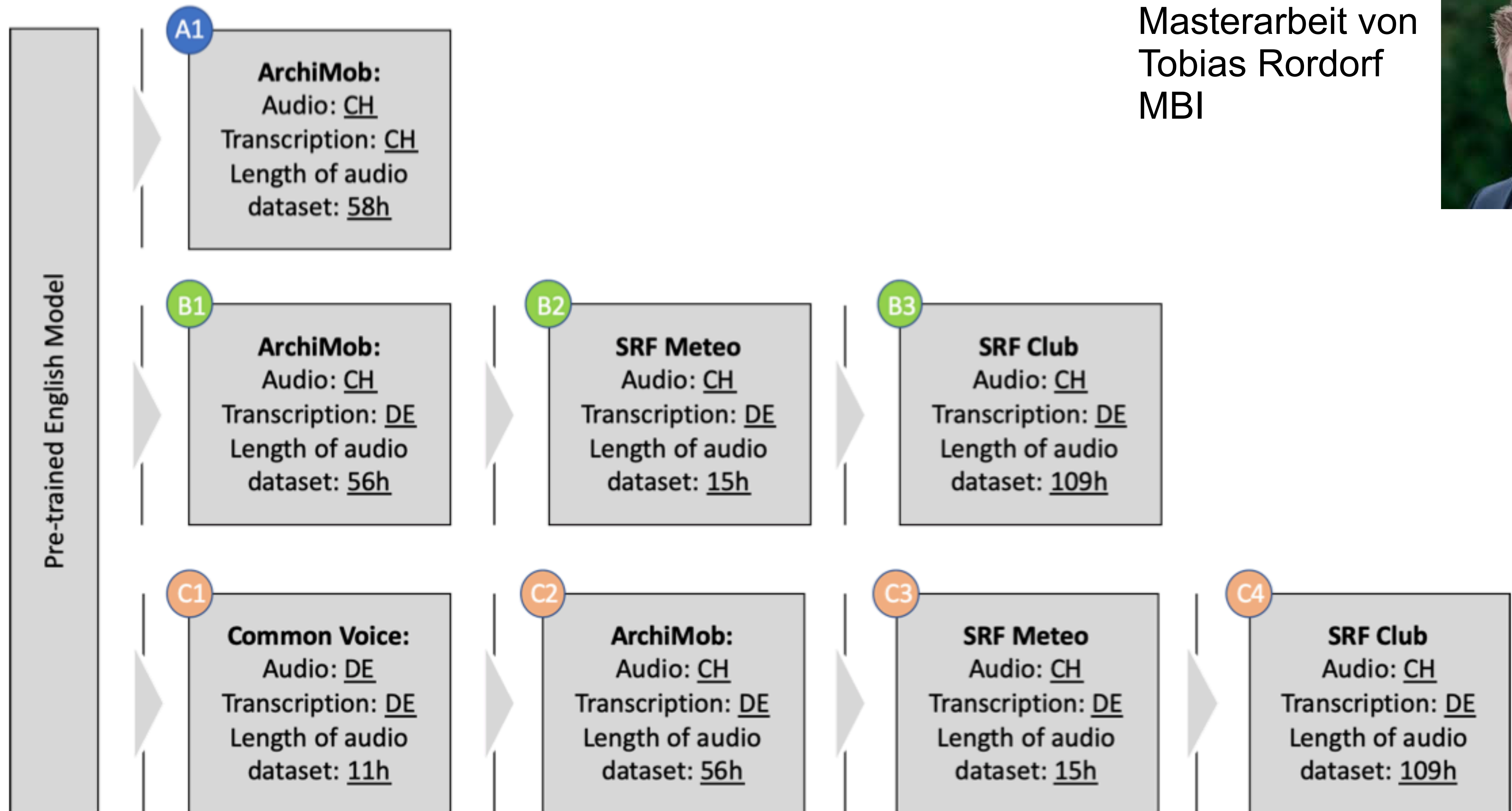
Currently: "Hier können#po Sie#po Ihre#po Bestellung aufgeben."

1) GR: {Do könd Sie Ihr Pstellig ufgää.} ("hier"→"da")

2) BE: {Hie chöid Dühr Eui Pstellig ufgää.} ("können Sie"→"könnt Ihr")

Data and ASR pipeline

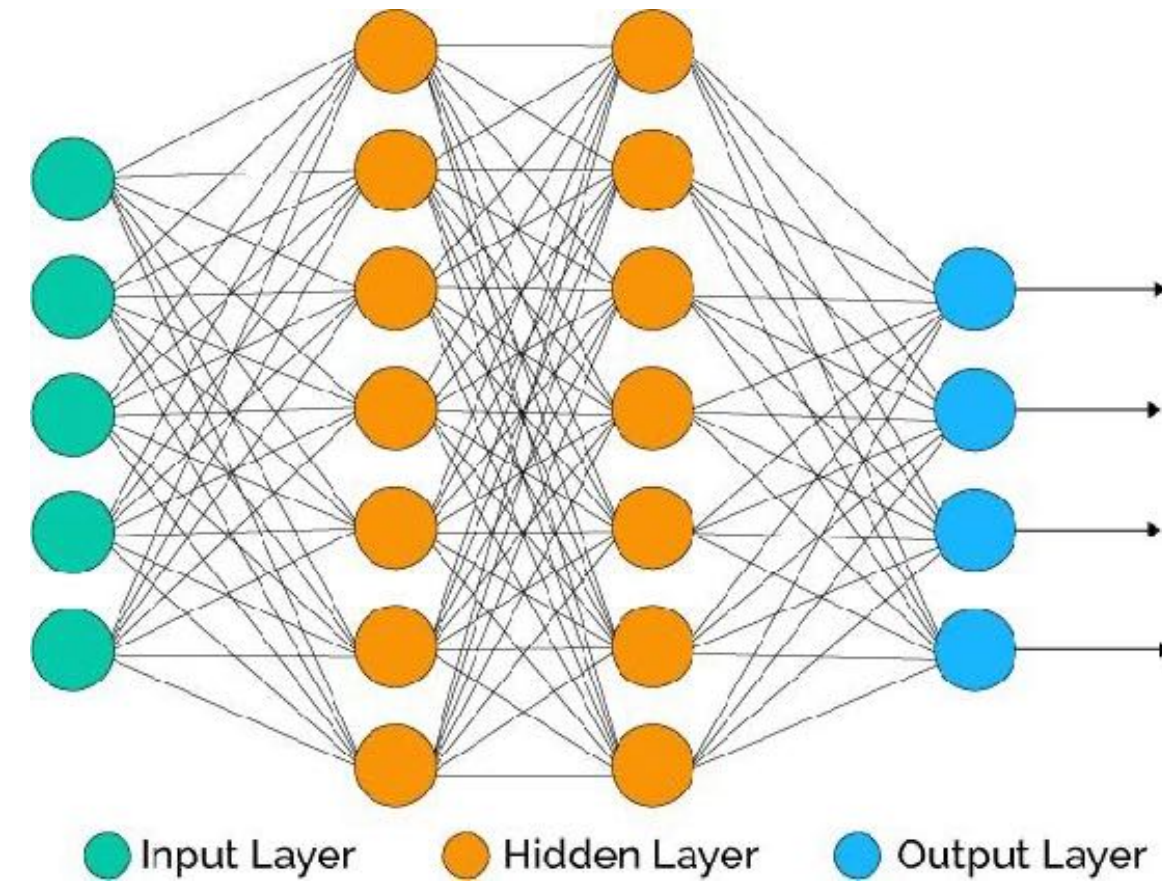
Masterarbeit von
Tobias Rordorf
MBI



Master thesis: Speech Recognition (ASR) for Swiss German

Deep Speech ASR Engine

Unidirectional RNN layer with LSTM cells



Masterarbeit von
Tobias Rordorf,
MBI



Automatische Untertitel



WER: 27.57%

Audio: CH
Transcription: DE
Length: 178h

574 dam

568 dam

562 dam

METEO

0° C





*“Do you have anything between
10 am and 12 pm?”*



Googles
Sprachassistent ruft
bei einem Coiffeur an

Zukunftsprognosen



Niels Bohr:

<<Prognosen sind immer schwierig, besonders wenn sie die Zukunft betreffen.>>

- Unternehmen erwarten, dass bis 2025 ein Drittel ihrer Geschäftsprozesse automatisiert sein wird.
- McKinsey schätzt, dass 22 Prozent der Anwaltstätigkeiten und 35 Prozent der Aufgaben von Anwaltsgehilfen automatisiert werden könnten.
- Bis in 5 Jahren gibt es Systeme/Chatbots, die es uns ermöglichen, wie mit einem Menschen zu kommunizieren.
- Roboter werden uns in der Zukunft unterstützen, als aktive Hilfe aber auch als Begleiter; insbesondere im Alter.

