

ToDo's

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KI Stack Aufbauen



Datenbeschaffung & Verständnis

Joel Weiss





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OSEMN

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Typische Probleme mit
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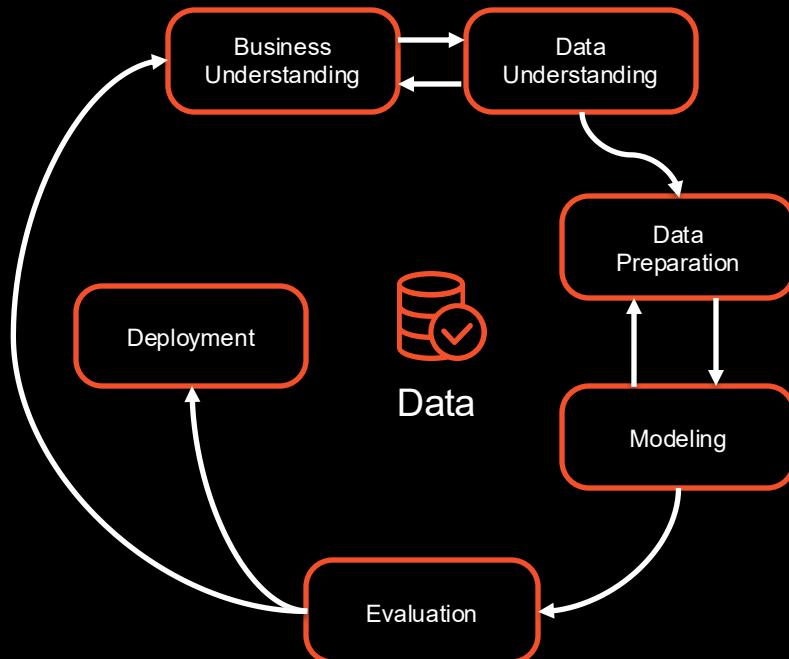


01

Projektphasen

CHRISP-DM
OSEMN

CRISP-DM (Cross-Industry Standard Process for Data Mining)



Business Understanding

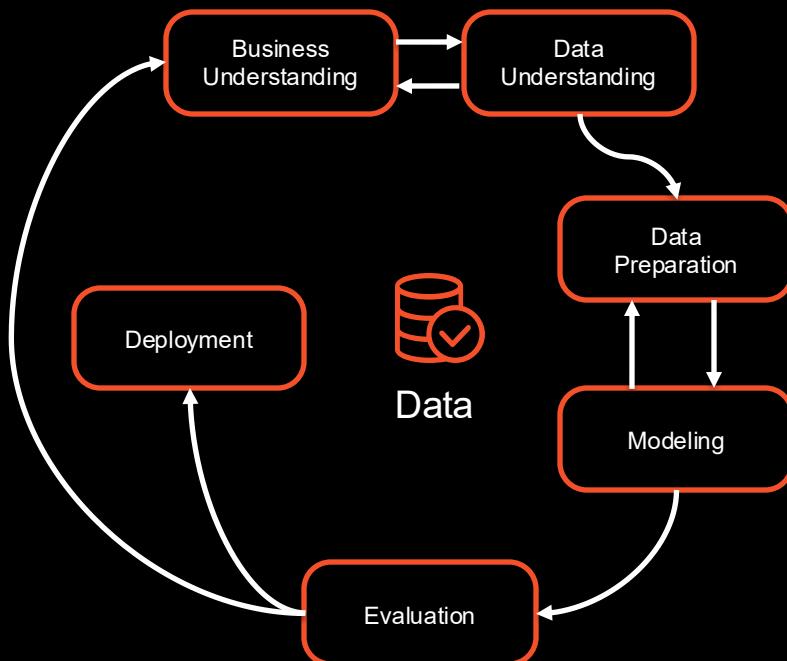
Was sind die Ziele auf Geschäftsebene?

Wie sehen die Anforderungen an das Ergebnis (KPIs) aus?

Welche Fragen müssen beantwortet werden, um das Ziel zu erreichen?

Wie kann das Ziel in ein Data Science Problemstellung umgewandelt werden?

CRISP-DM (Cross-Industry Standard Process for Data Mining)



Data Understanding

Welche Daten liegen vor?

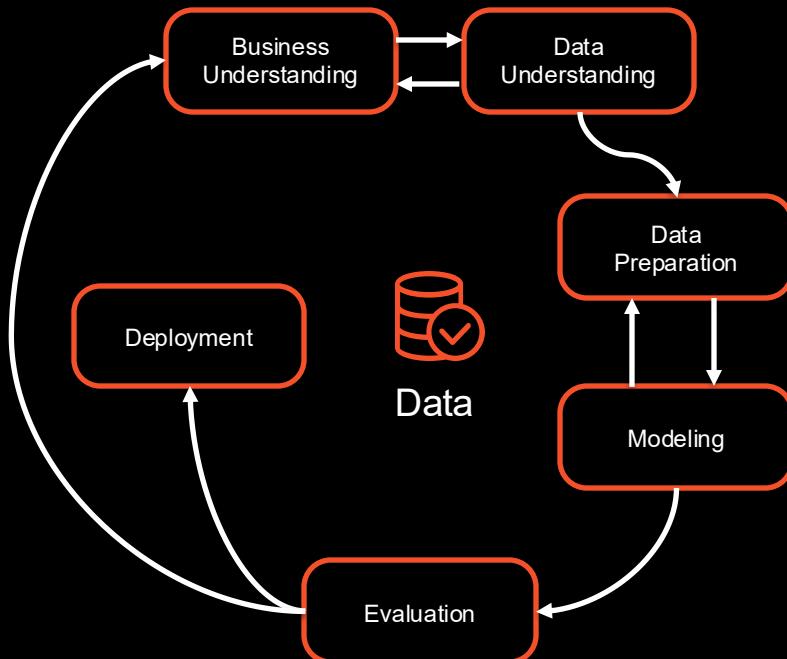
Wie sehen die Daten aus?

Welche Qualitätsprobleme kann man erkennen?

Welche Zusammenhänge kann man erkennen?

Beeinflussen die Erkenntnisse die gesetzten Ziele?

CRISP-DM (Cross-Industry Standard Process for Data Mining)

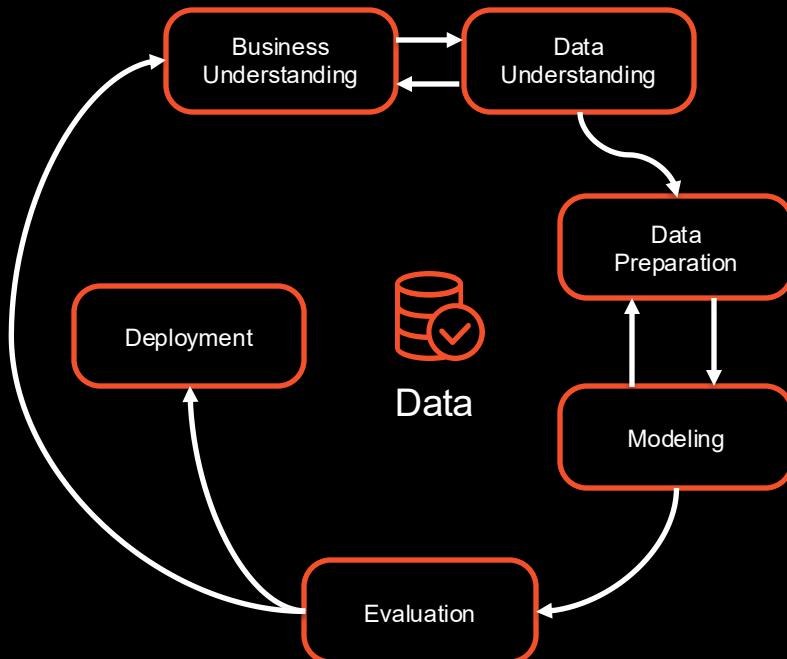


Data Preparation

Sind die Daten in der richtigen Form zur Weiterverwendung?

Welche Feature Engineering Methoden können helfen das Modeling effizienter machen?

CRISP-DM (Cross-Industry Standard Process for Data Mining)



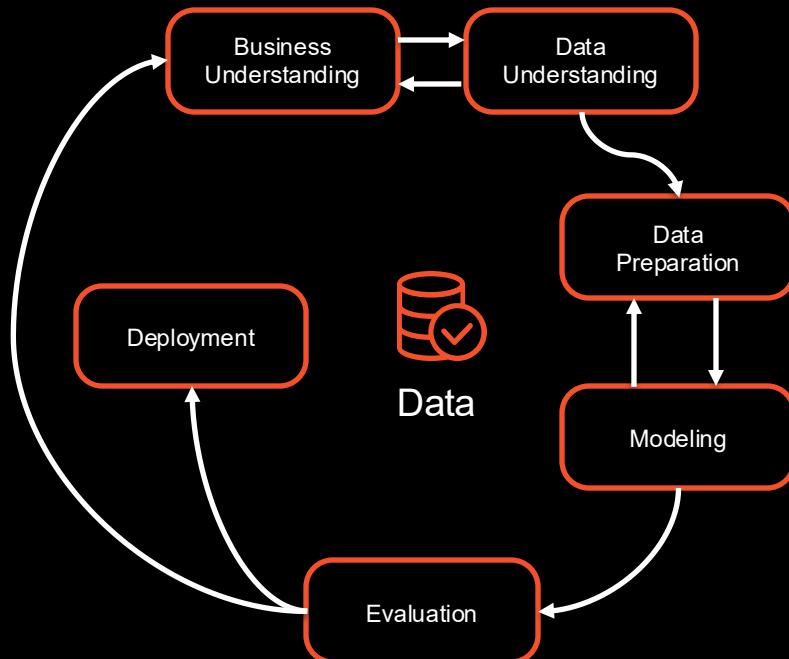
Modeling

Welches Modell löst das Problem?

Wie kann ich das Modell/Verfahren optimieren?

Welche Alternativen gibt es?

CRISP-DM (Cross-Industry Standard Process for Data Mining)



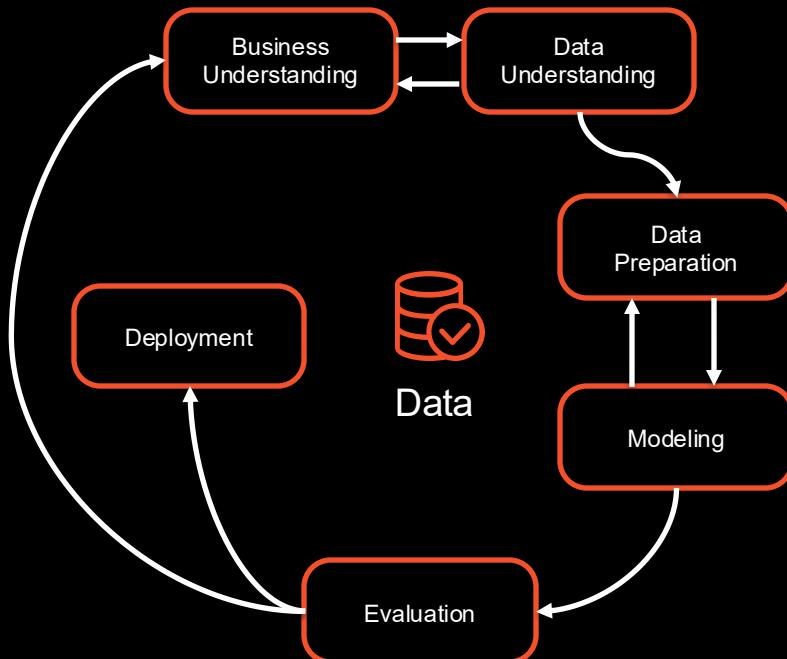
Evaluation

Welches Modell ist das Beste?

Kann das Modell die definierten Ziele erreichen?

Wie kann ich das Modell/Verfahren optimieren?

CRISP-DM (Cross-Industry Standard Process for Data Mining)



Deployment

Wie kann ich die Ergebnisse präsentieren?

Wie kann ich das Modell Verfügbar machen?

Wie kann ich sicherstellen, dass das Modell aktuell bleibt?

O

Obtain

Gather data from relevant sources

S

Scrub

Data Cleaning to correct formats

E

Explore

Exploratory Data analysis and find patterns

M

Model

Build models to predict and forecast

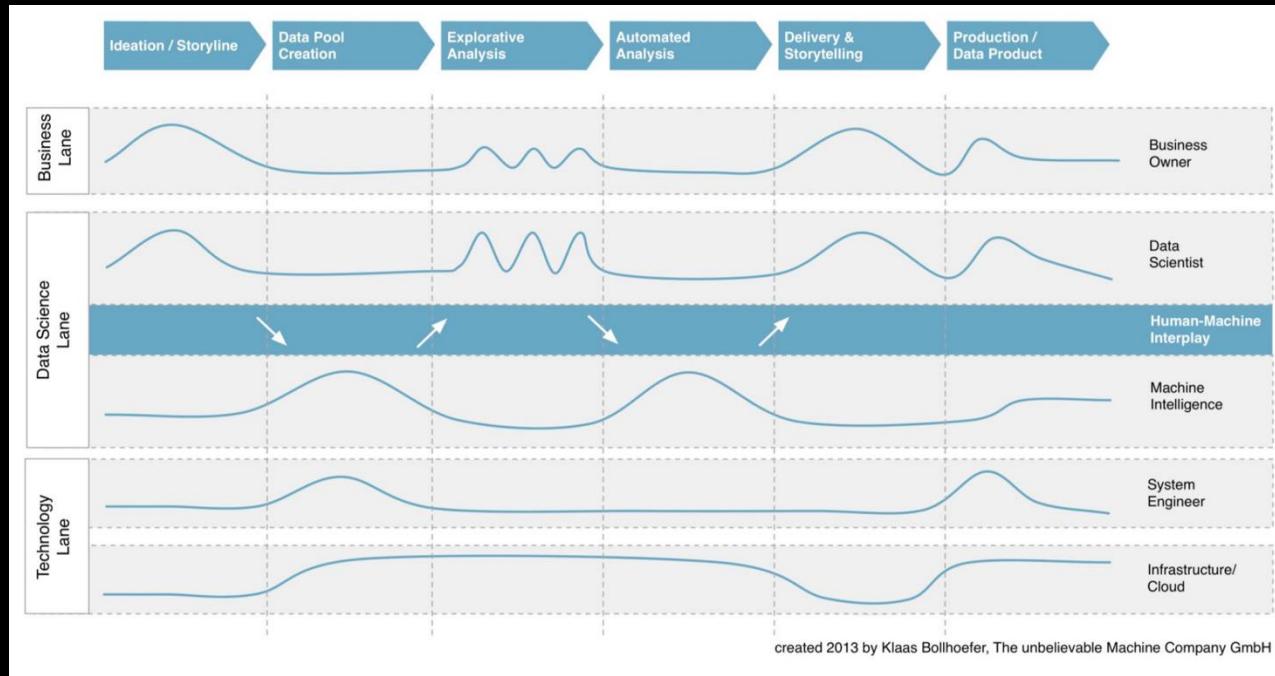
N

Interpret

Deploy models and turn insights into actions

In a 2010 post called “*A Taxonomy of Data Science*” on the [dataists](#) blog, Hilary Mason and Chris Wiggins introduced the OSEMN framework.

Data-Science-Prozess-Modell – Schematische Darstellung





02

Datentypen

CSV, Datenbanken und
API's

Daten

Strukturiert

```
1 Driver,Team,Lap,Time,Position  
2 Max Verstappen,Red Bull,1,1:34.123,1  
3 Lewis Hamilton,Mercedes,1,1:34.567,2  
4 Charles Leclerc,Ferrari,1,1:35.012,3  
5 Lando Norris,McLaren,1,1:35.230,4
```

Un
Strukturiert



Klassische Datenformate

CSV

Textbasiert, sehr verbreitet



einfach, universell,
leicht mit
Excel/Notepad lesbar



einfach, universell,
leicht mit
Excel/Notepad lesbar

```
1 Driver,Team,Lap,Time,Position
2 Max Verstappen,Red Bull,1,1:34.123,1
3 Lewis Hamilton,Mercedes,1,1:34.567,2
4 Charles Leclerc,Ferrari,1,1:35.012,3
5 Lando Norris,McLaren,1,1:35.230,4
```

Parquet

Spaltenorientiertes Speicherformat



Komprimiert binär



Schwer Lesbar
Mehr Overhead

```
1 PAR1.....snappy.....Red
2 Bull....Driver....Time....Lap.....
3 .....binary data.....
4 .....more binary.....
5 PAR1
```



JSON/XML

Strukturierte Formate für semi-strukturierte Daten

Einfach lesbar
flexibel

Keine
Typinformationen

```
1 {
2   "Driver": "Verstappen",
3   "Team": "Red Bull",
4   "Laps": [
5     {"Lap": 1, "Time": "1:34.1"}, 
6     {"Lap": 2, "Time": "1:33.9"}, 
7     {"Lap": 3, "Time": "1:34.0"} 
8   ]
9 }
```

Datenbanken

- 1. Relationale Datenbanken (SQL)**
- 2. NoSQL-Datenbanken**
- 3. Key-Value-Datenbanken**
- 4. Graph-Datenbanken**
- 5. Vektor-Datenbanken**



1. Relationale Datenbanken (SQL)

Speichern Daten in Tabellen mit Zeilen und Spalten.

Sie nutzen SQL (Structured Query Language) zur Abfrage

PostgreSQL (Postgres)

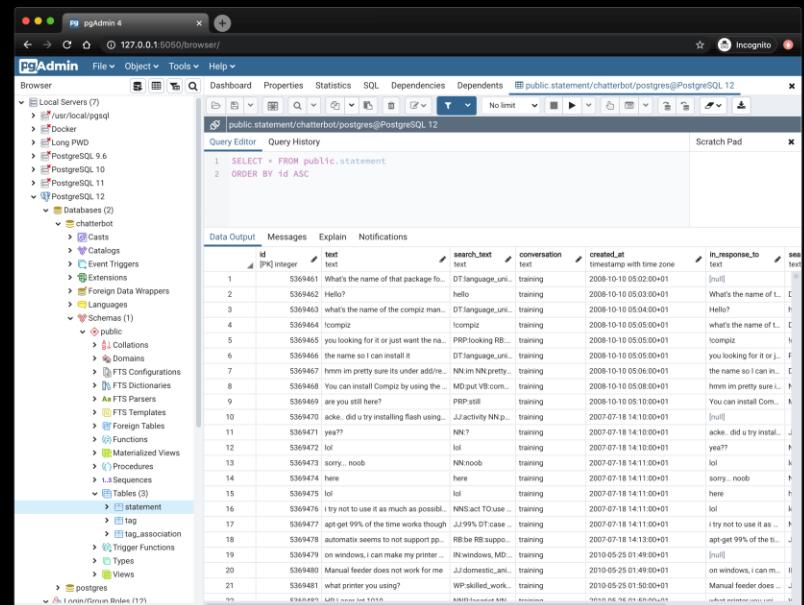
MySQL / MariaDB

Microsoft SQL Server

Oracle Database

SQLite

```
1 SELECT f.Name AS Fahrer, t.TeamName, e.Platz
2 FROM Ergebnisse e
3 JOIN Fahrer f ON e.FahrerID = f.FahrerID
4 JOIN Teams t ON f.TeamID = t.TeamID
5 WHERE e.RennenID = 1
6 AND e.Platz <= 3
7 ORDER BY e.Platz ASC;
```



2. NoSQL-Datenbanken

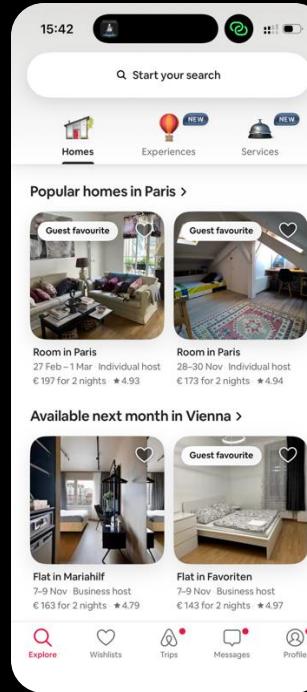
Speichert Daten nicht in Tabellen

- MongoDB (AirBnB)
- Cassandra (Netflix, Instagram)
- Redis (Twitter)
- CouchDB (BBC Content Management)



abfrage der top 3 Fahrer in einer Mongo DB

```
db.ergebnisse.aggregate([
  { $match: { rennenID: 1, platz: { $lte: 3 } } },
  { $sort: { platz: 1 } },
  { $project: { _id: 0, fahrer: 1, team: 1, platz: 1
} }
]);
```

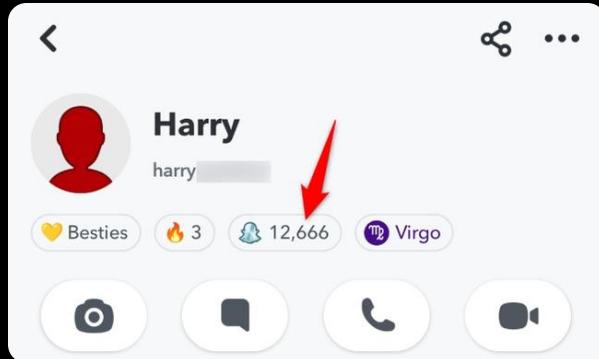


3. Key-Value-Datenbanken

Sehr schnelle lese und schreibzugriffe

Genutzt zum speichern von Browser Sessions

Beispiel auch Redis (Twitter, Snapchat)

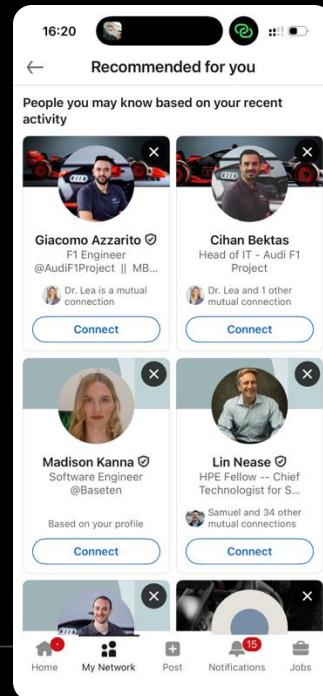


```
key value - Beispiel

key = "race:monaco2025"
value = {
    "1": "Verstappen",
    "2": "Leclerc",
    "3": "Hamilton"
}
```

4. Graph-Datenbanken

- Neo4j
- Amazon Neptune
- Microsoft Azure Cosmos DB (Graph API)
- ArangoDB
- OrientDB



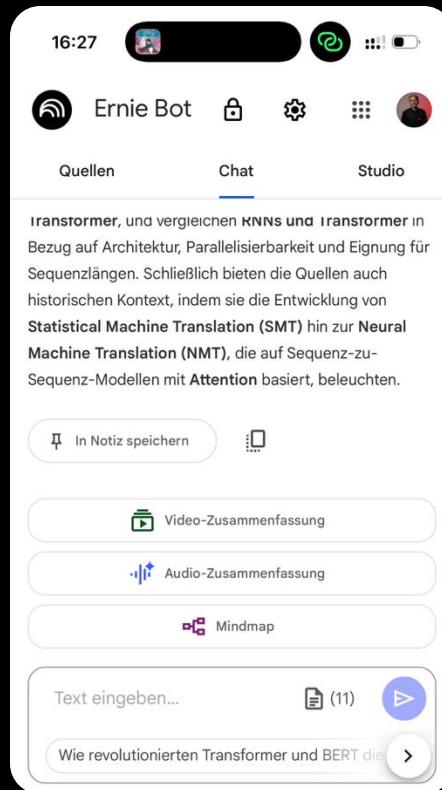
Welche Fans folgen Max Verstappen?

```
MATCH (f:Fan)-[:FOLLOWS]->(d:Driver {name:"Max Verstappen"})  
RETURN f.username
```

5. Vektor-Datenbanken

Datenbanken die mit LLMs verwendet werden:

- Pinecone
- Weaviate
- Milvus
- Qdrant
- Vespa

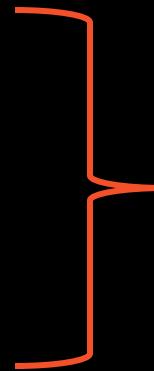


Aufgabe: Suche 3 Apps oder Services deiner Wahl und finde heraus, welche Datenbanken Art genutzt wird.

1. Relationale Datenbanken (SQL)
2. NoSQL-Datenbanken
3. Key-Value-Datenbanken
4. Graph-Datenbanken
5. Vektor-Datenbanken

Streaming Data

- Aktien Märkte
- Wetter
- Verkehr
- Trends
- Rennstrecke



TimeSeries/Zeitreihenanalyse



Links:

[Dashboard 1](#)

[Dashboard 2](#)

API's

The screenshot shows a web browser window displaying the OpenF1 API documentation. The URL is <https://openf1.org/#api-endpoints>. The left sidebar has a search bar and a navigation menu with the following items:

- Introduction
- API endpoints
- Car data** (selected)
- Drivers
- Intervals
- Laps
- Location
- Meetings
- Overtakes (beta)
- Pit
- Position
- Race control
- Sessions
- Session result (beta)
- Starting grid (beta)
- Stints

Below the menu, there is a "Contact | Made in Paris, France" link.

The main content area has a header "HTTP Request" with a "GET https://api.openf1.org/v1/car_data" example. It also includes a "Sample URL" section with the URL https://api.openf1.org/v1/car_data?driver_number=55&session_key=9159&speed>=315.

The "Attributes" section lists the following fields:

Name	Description
brake	Whether the brake pedal is pressed (100) or not (0).
date	The UTC date and time, in ISO 8601 format.
driver_number	The unique number assigned to an F1 driver (cf. Wikipedia).
drs	The Drag Reduction System (DRS) status (see mapping table below).
meeting_key	The unique identifier for the meeting. Use latest to identify the latest or current meeting.

On the right side, there is a terminal-like interface with tabs for shell, python, r, and javascript. The shell tab shows the command `curl "https://api.openf1.org/v1/car_data?driver_number=55&session_..."`. The output pane displays the JSON response from the API call, which consists of two objects representing different meetings.

```
[{"brake": 0, "date": "2023-09-15T13:08:19.923000+00:00", "driver_number": 55, "drs": 12, "meeting_key": 1219, "n_gear": 8, "rpm": 1141, "session_key": 9159, "speed": 315, "throttle": 99}, {"brake": 100, "date": "2023-09-15T13:35:41.808000+00:00", "driver_number": 55, "drs": 8, "meeting_key": 1219, "n_gear": 8, "rpm": 11023, "session_key": 9159, "speed": 315, "throttle": 57}]
```

Link: <https://openf1.org/#api-endpoints>

API's

- 1. NASA Open API (NASA Daten)**
- 2. The Cat API (Tiere)**
- 3. TMDB API (Filme)**
- 4. OpenWaterMap (Wetterdaten)**
- 5. REST Countries API (Länder)**
- 6. ChatGPT API**

KI-Aufgabe

Baue ein HTML Javascript Dashboard welches ein paar Dinge von dieser API <https://openf1.org/#api-endpoints> abgreift und sie anzeigt.

The screenshot shows a browser window with two tabs: "ChatGPT" and "OpenF1-dashboard". The "OpenF1-dashboard" tab displays a dark-themed dashboard for the "OpenF1 Dashboard — Demo".

Aktuelles Meeting:
Singapore Grand Prix (2025)
Ort: SGP
Meeting key: 1270

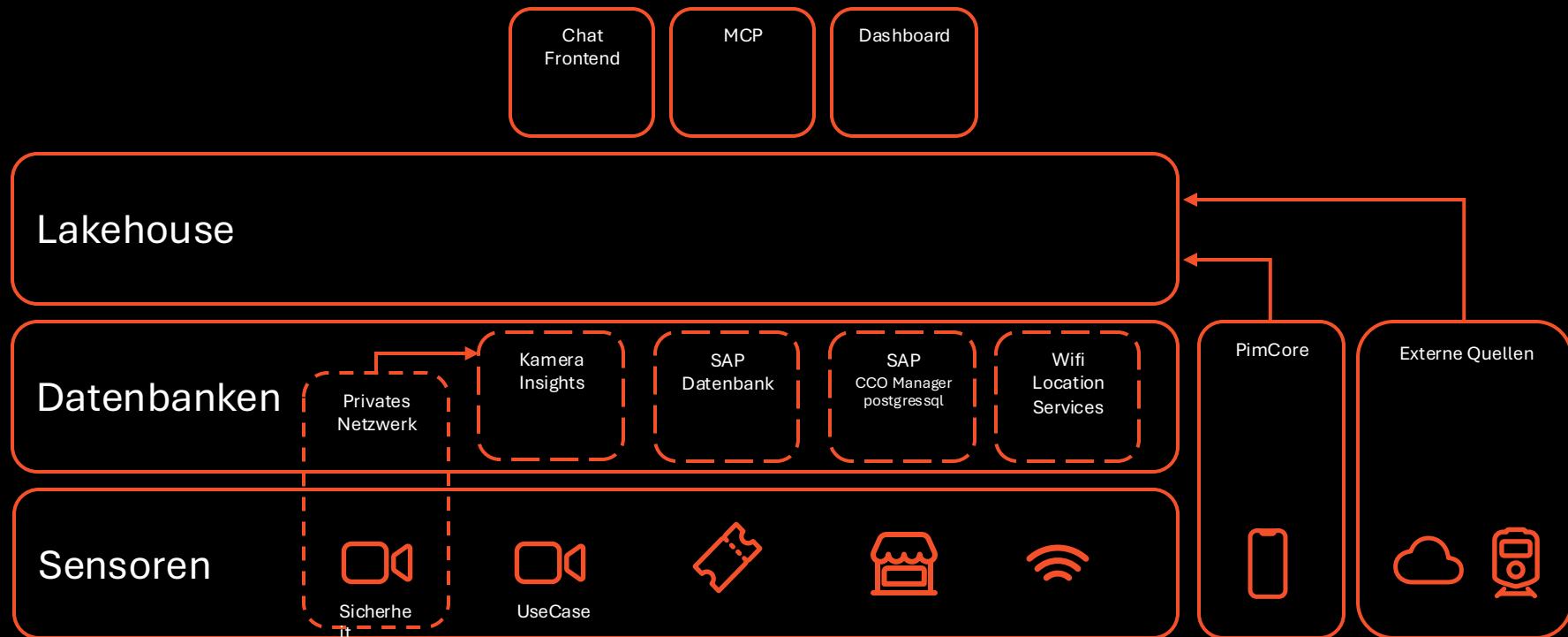
Fahrer – aktuell:

#	Fahrer	Team	Nation
1	Max VERSTAPPEN	Red Bull Racing	—
4	Lando NORRIS	McLaren	—
5	Gabriel BORTOLETO	Kick Sauber	—
6	Isack HADJAR	Racing Bulls	—
10	Pierre GASLY	Alpine	—
12	Kimi ANTONELLI	Mercedes	—

Live-Intervalle (Gaps):

#	Driver	Gap to leader	Interval
1	63	0	0
2	1	0.24	0.24
3	81	0.368	0.128
4	4	0.585	—
5	12	0.635	0.267
6	16	0.957	—
7	44	1.006	0.421
8	6	1.257	0.3
9	87	1.314	0.057

DataLake



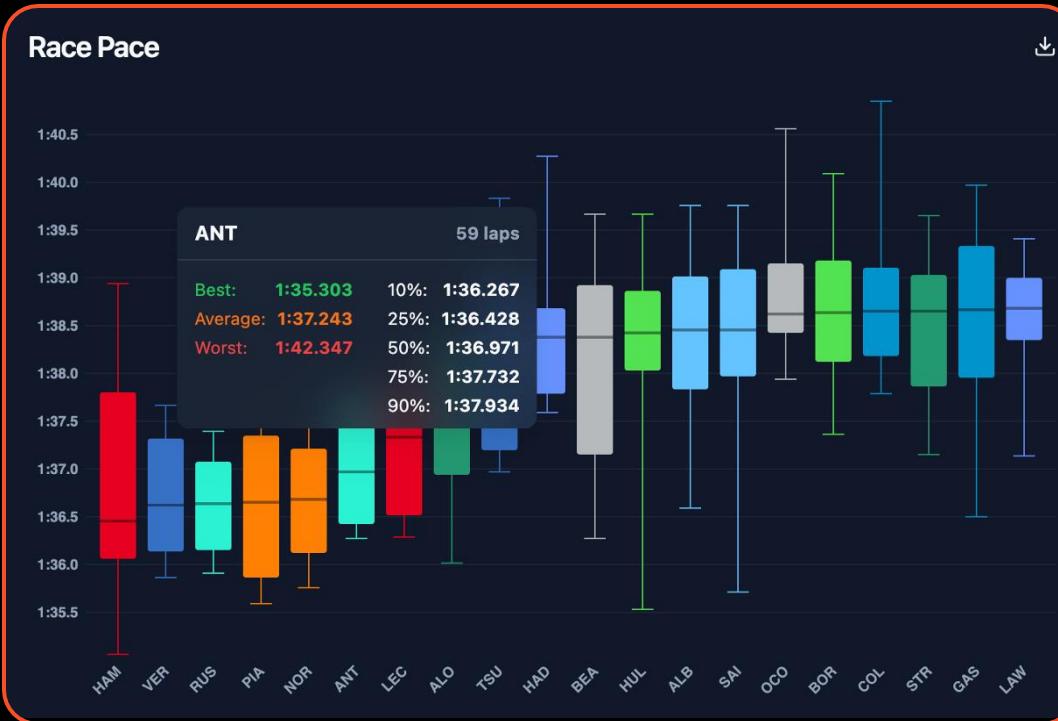


03

Basisstatistiken

Erste Einblicke in Daten

Basis-Statistiken



Warum der Durchschnitt nicht alles ist

Bei Formel1 rennen in Singapore hat Hamilton die niedrigste durchschnittszeit für eine Runde warum hat er das Rennen trotzdem nicht gewonnen?

Perplexity Images Sources · 10 Steps

Sky Sport
Lewis Hamilton bekommt Strafe nach Singapur-...

SPEEDWEEK.com
Hamilton: Bremsversagen und Strafe, trotzdem...

Motorsport.com
FIA strafft Hamilton nach Singapur-Rennen -...

youtube
Piastrai hadert mit Norris I Rennen F1 Singapur 2025



Lewis Hamilton hatte beim Formel-1-Rennen in Singapur 2025 zwar die schnellste durchschnittliche Rundenzeit und erzielte die schnellste Rennrunde, konnte das Rennen aber nicht gewinnen, weil er in den letzten Runden ein schwerwiegendes Bremsproblem an seinem Ferrari hatte und dadurch mehrfach die Strecke abkürzen musste. Aufgrund dieser Regelverstöße bekam er nachträglich eine 5-Sekunden-Strafe, die ihn letztlich weiter zurückwarf und Positionen kostete, unter anderem verlor er seinen siebten Platz an Fernando Alonso. [sport.sky](#) +4

Race Winner		Season 2025		Grand Prix Singapore	
Russell		Russell		Hamilton	
1:40:22.367		1:29.158		Lap 48 – 1:33.808	
Practice 1		Practice 2		Practice 3	
Qualifying		Starting Grid		Race	
POS.	NO.	DRIVER	TIME	GAP TO LEADER	INTERVAL
1	63	Russell	1:40:22.367		25 62
2	1	Verstappen	1:40:27.797	+5.430s	+5.430s 18 62
3	4	Norris	1:40:28.433	+6.066s	+0.636s 15 62
4	81	Piastrai	1:40:30.513	+8.146s	+2.080s 12 62
5	12	Antonelli	1:40:56.048	+33.681s	+25.535s 10 62
6	16	Leclerc	1:41:08.363	+45.996s	+12.315s 8 62
7	14	Alonso	1:41:43.034	+80.667s	+34.671s 6 62
8	44	Hamilton	1:41:47.618	+85.251s	+4.584s 4 62
9	87	Bearman	1:41:55.894	+93.527s	+8.276s 2 62

50.250€

Brutto Durchschnittsgehalt in Deutschland liegt 2024



43.750€

Brutto Median einkommen



<https://www.finanz.de/gehalt/> 12.10.25



04

Datenqualität

Typische Probleme mit
Daten

Datenqualität

1. Fehlende Beschriftungen und Informationen
2. Beschriftung falsch
3. Fehlende Werte und Duplicate
4. Daten von unterschiedlichen Quellen – Zeitzonen
5. Anonymisierung

**Sind die daten
passend und ist die
Qualität
ausreichend, um
die Frage zu
beantworten?**

Race	Date	Driver	Team	Position	Lap_Time_Avg_s
Monaco GP	2024-05-26	Max Verstappen	Red Bull	1	74.321
British GP	2024-07-07	Lando Norris	McLaren	2	75.874
Italian GP	2024-09-08	NaN	Ferrari	3	76.125
Japanese GP	2024-10-13	Lewis Hamilton	Mercedes	4	76.412
British GP	2024-07-07	Lando Norris	McLaren	2	75.874

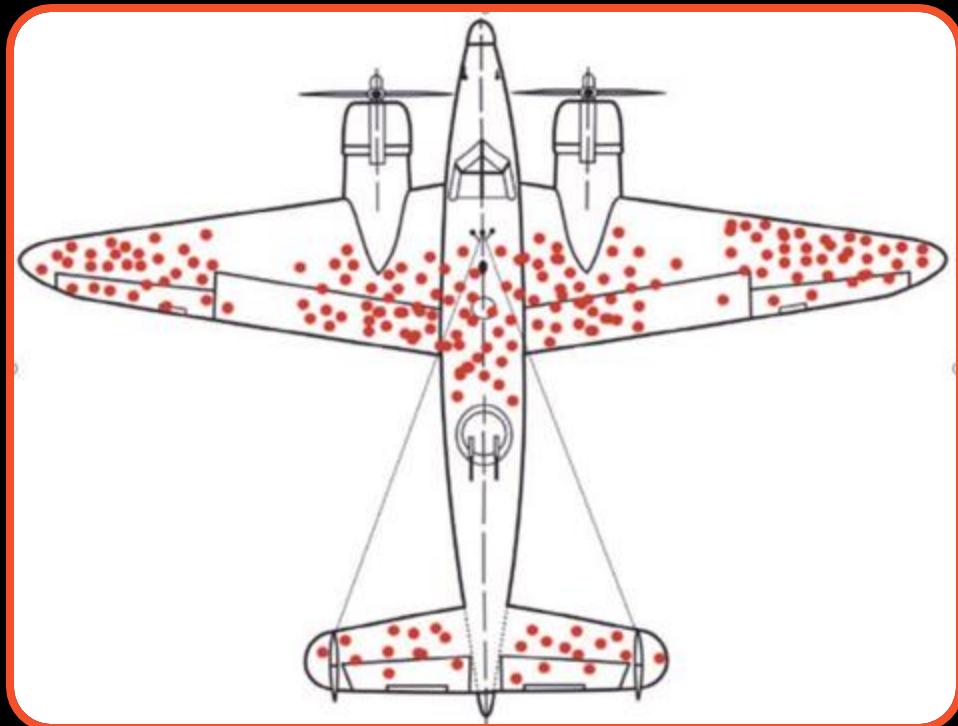
		Date	Driver	Team	Lap_Time_Avg_s
0	Japan	2024-05-26	Max Verstappen	Red Bull	74.321
1	Italy	2024.07.07	Lando Norris	McLaren	75.874

Race	DateTime	Driver	Team	Position
Monaco GP	2024-05-26 15:00 +02:00	Max Verstappen	Red Bull	1
British GP	2024-07-07 14:00 +01:00	Lando Norris	McLaren	2
...

Race	Date	Team	Position	Lap_Time_Avg_s	Driver_ID
Monaco GP	2024-05-26	Red Bull	1	74.321	DRV001
...

Survivorship Bias

„What You Don’t See Can Kill You – Abraham Wald’s Missing Bullet Holes“



Bias

1

1. Confirmation Bias – Bestätigungsfehler

Ein Forscher testet eine Hypothese und sucht nur nach Belegen, die sie bestätigen, statt sie zu widerlegen.

2

2. Selection Bias – Auswahlverzerrung

In der Medizin scheinen neue Medikamente wirksam – weil sie nur an gesunden Freiwilligen getestet wurden.

3

3. Anchoring Bias – Ankerheuristik

Wenn man Leuten zuerst „1000 €“ nennt, und dann fragt, was sie für etwas zahlen würden, ist ihre Schätzung höher, als wenn man mit „100 €“ beginnt.

4

4. Availability Bias – Verfügbarkeitsverzerrung

Nach einem Flugzeugabsturz denken viele, Fliegen sei gefährlich – obwohl Autofahren statistisch riskanter ist.

5

5. Outcome Bias – Ergebnisverzerrung

Ein riskanter Entscheid wird gelobt, wenn er gut ausgeht, und kritisiert, wenn er scheitert – unabhängig von der Qualität der Entscheidung.



Datengetriebene Geschäftsmodelle

Joel Weiss





Inhalt

01

Das Problem

03

**Wer macht es besonders
gut?**

02

Wie funktioniert es?

04

**Was jeder daraus lernen
kann.**



01

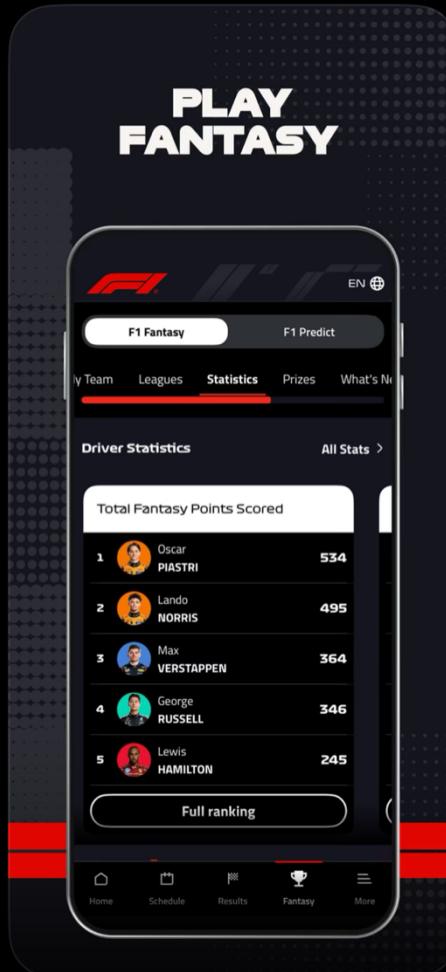
Das Problem

Warum sammeln wir Daten

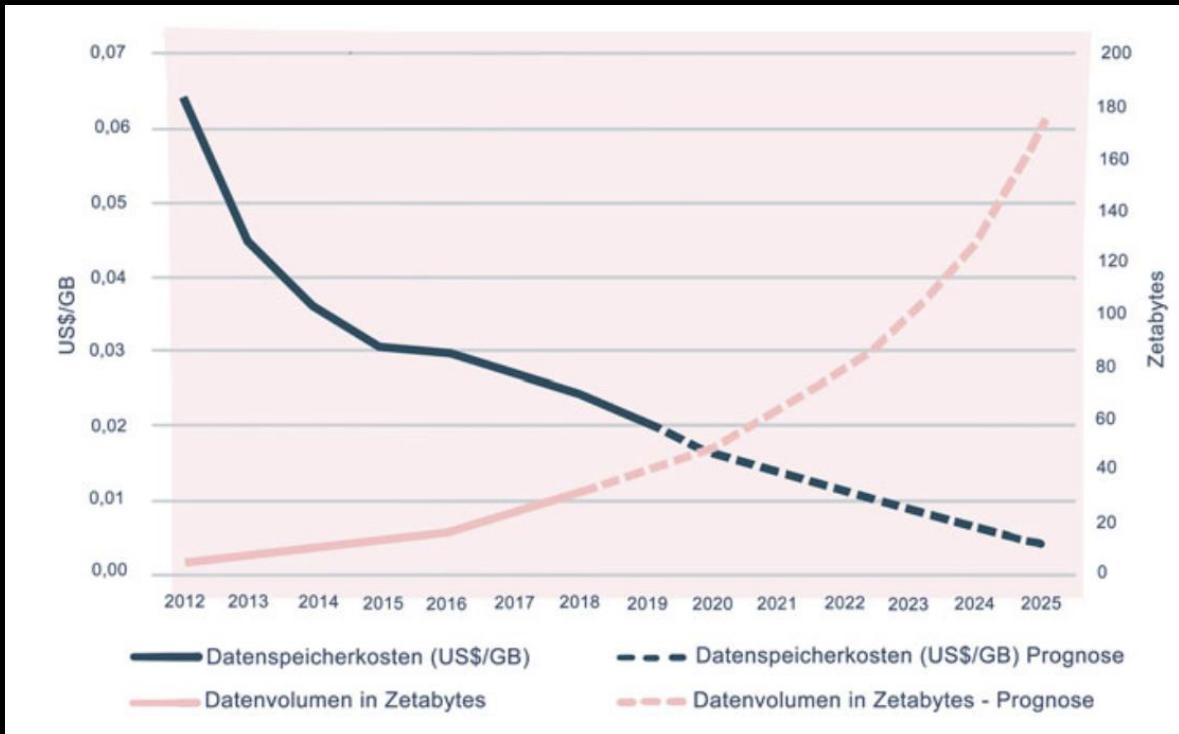


**Was verkaufe ich in
meinem Laden?**
Größen? Produkte?
Partner?

**Wie entscheide ich
welches Feature als
nächstes in meine
App kommt?**



Entwicklung der Kosten für Speichermedien





02

Wie funktioniert es?

Was macht das Unternehmen?

Schober → GET TO KNOW UDO NOW!



SUMMARIZED:

The Schober Information Group makes companies more successful in marketing and sales – by combining decades of data expertise with modern technology. With the four-stage “Brahm’s Staircase” model (data quality, data enrichment, analysis & AI, campaign control), we create the basis for targeted, data-driven growth in the B2B and B2C sectors.

At its heart is our udo platform – a customer data platform specifically for SMEs. udo brings together customer data from all sources, cleanses and supplements it with features from the unique Schober data universe and, based on this, enables AI-supported analyses and automated, cross-channel communication. Thanks to its simple connection to existing systems, udo is ready for immediate use – without the need for complex IT projects.

Our USP: The combination of our own platform, excellent data quality and over 75 years of experience in data-supported customer acquisition.



Let's Connect!!

Daten als Produkt („Data as a Product“)

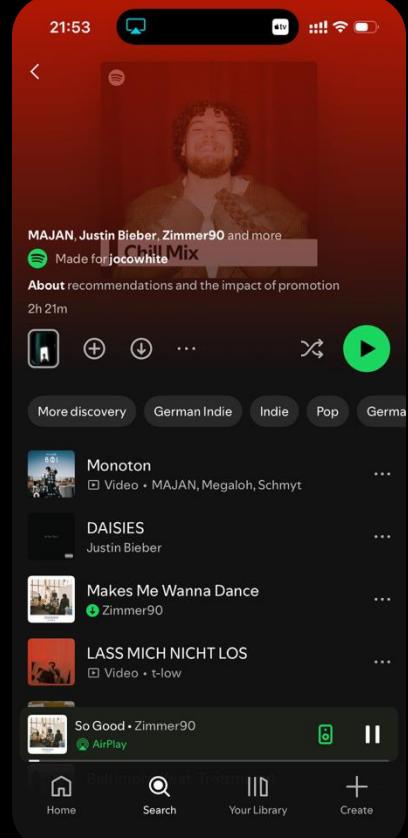
- Schufa / Creditreform
- HERE / TomTom
- Social Media Plattformen
- Bloomberg / Refinitiv

Daten als Service („Data as a Service“, DaaS)

- Google Analytics / Adobe Analytics
- SAP Data Warehouse Cloud / Snowflake
- Weather API Anbieter

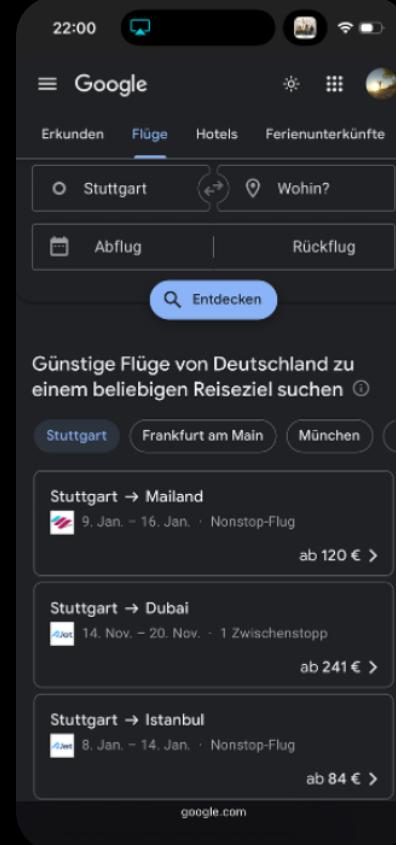
Algorithmus- bzw. Modellbasierte Geschäftsmodelle

- Spotify / Netflix
- Tesla
- FinTechs (Scoring-Modelle)
- OpenAI / DeepL



Datengetriebene Optimierung interner Prozesse

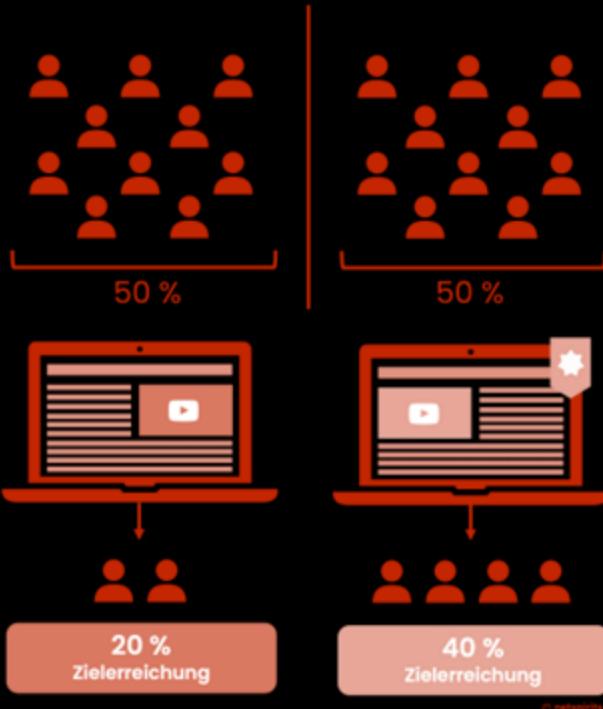
- A/B-Testing
- Predictive Maintenance
- Demand Forecasting
- Dynamic Pricing



A/B Tests

Testen unterschiedlicher Versionen auf der gleichen Plattform oder Website

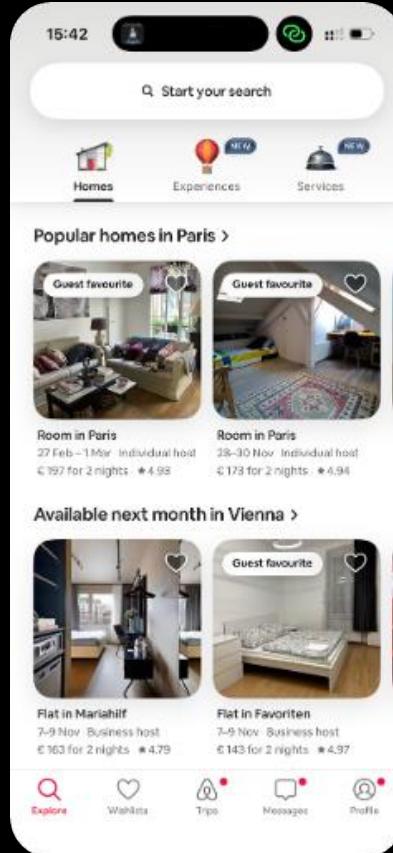
- Instagram App
- Youtube Thumbnails/Titel



https://www.netspirits.de/blog/youtube_ab-tests/

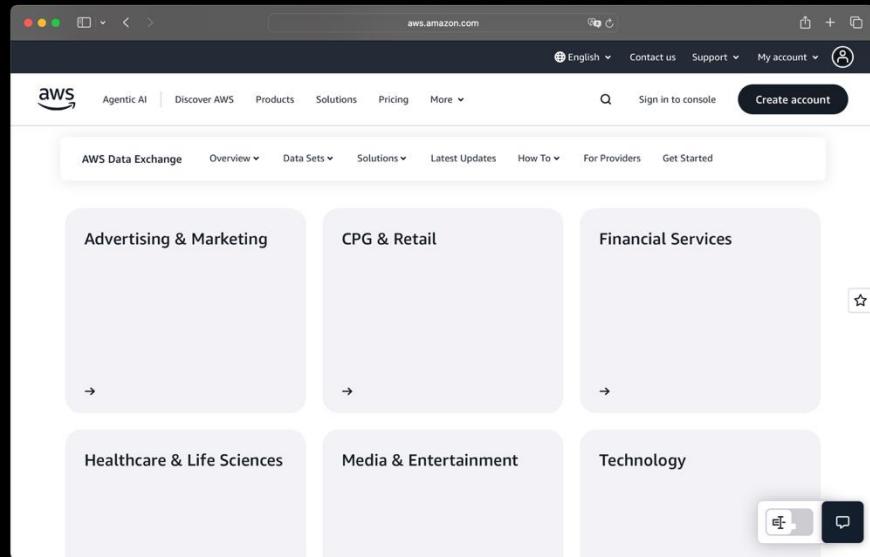
Plattform-Modelle mit Daten- Network-Effects

- Google / Facebook
- Amazon
- Airbnb / Uber



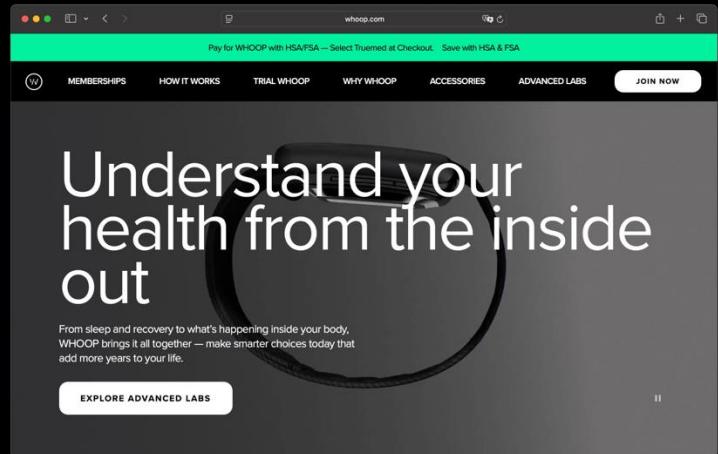
Datenhandel / Datenmarktplätze

- AWS Data Exchange
- Snowflake Marketplace
- Datapace / Dawex



Datengetriebene Ökosysteme

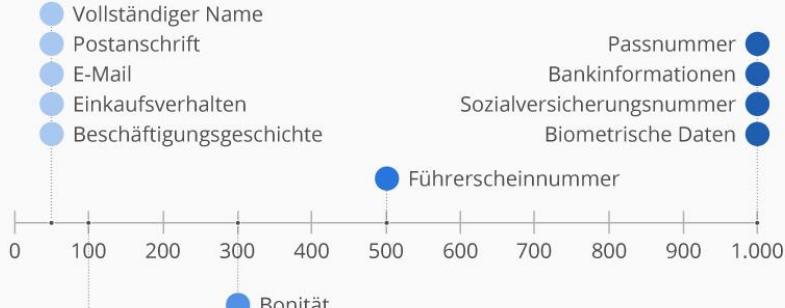
- Apple HealthKit / Google Fit
- Smart Home (Amazon Alexa)
- Connected Car Services



Preis für Daten

Der Preis der persönlichen Daten

Preis, den Erwachsene in den USA für personenbezogene Daten aufrufen würden (in US-Dollar)*



Laut einer Umfrage von NBC News/Wall Street Journal aus dem März 2019 finden **74%** der US-Amerikaner, dass es **nicht fair** ist, dass Social-Media-Unternehmen Daten im Austausch für kostenlose Dienste **sammeln und nutzen**.



Generative künstliche Intelligenz

Joel Weiss





Inhalt

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Embeddings

Vektoren und
Vekordatenbanken

03

Multimodal

Modelle können mehr

02

LLM's

Attention is all you need

04

KI Stack

Was man sonst so
braucht



Wie funktioniert
Chat GPT?

Was macht Chat da?

Artificial Intelligence is transforming the

way 53%
world 43%
lives 2,4%
fields 1,3%
future 1,1%

...
...
...



***Mach
erstma`
die Basics.***



01

Embeddings

Tokenisierung

Hello How is it going?

Sequence of Letters

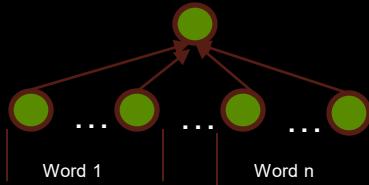
Tokenization

Hello How is it going?

Ordered
Sequence
of Classes

The bag of words

Sparse Input (1-hot)



$p \gg n$ (overfitting!)



No semantic
generalization

dog: 1 0 0 0 0 ... 0
cat: 0 0 1 0 0 ... 0



lots of data required,
low accuracy

Co-Occurrence Pattern

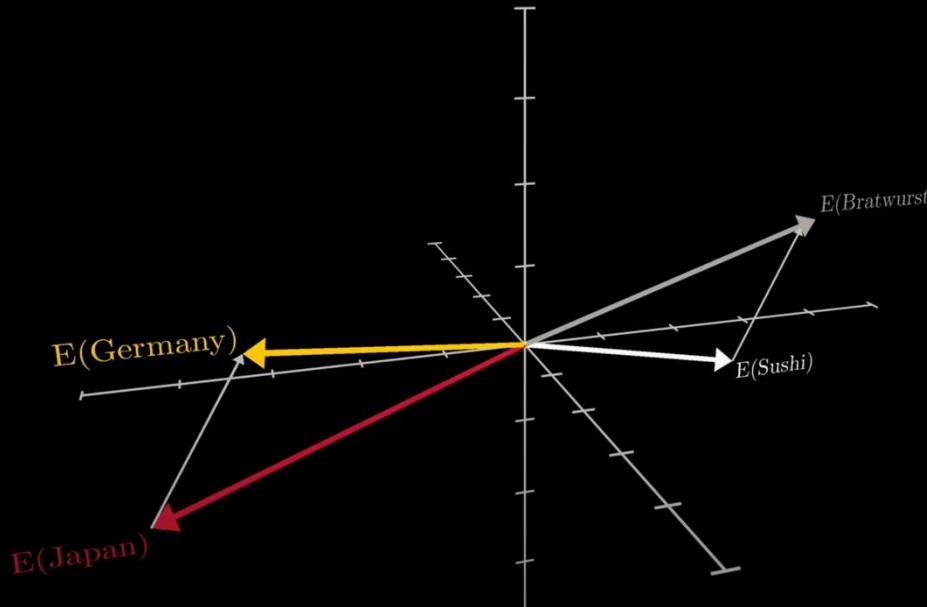
	a	big	bug	the	little	but	beetle	bit	back
a	0	5	4	2	1	0	0	3	0
big	5	0	10	8	4	0	4	8	4
bug	4	10	0	8	4	0	4	8	5
the	2	8	8	0	8	3	8	10	3
little	1	4	4	13	1	3	10	8	0
but	0	0	0	7	7	0	7	3	0
beetle	0	4	4	11	11	4	1	8	1
bit	3	8	7	12	9	3	8	0	1
back	0	4	5	3	0	0	1	2	0

Das Problem mit unserer Sprache



Embedding Space

$$E(\text{Sushi}) + E(\text{Germany}) - E(\text{Japan}) \approx [E(\text{Bratwurst})]$$



<https://www.youtube.com/watch?v=wjZofJX0v4M>



02

LLM's

Transformer



Attention Is All You Need

Ashish Vaswani*
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avaswani@google.com

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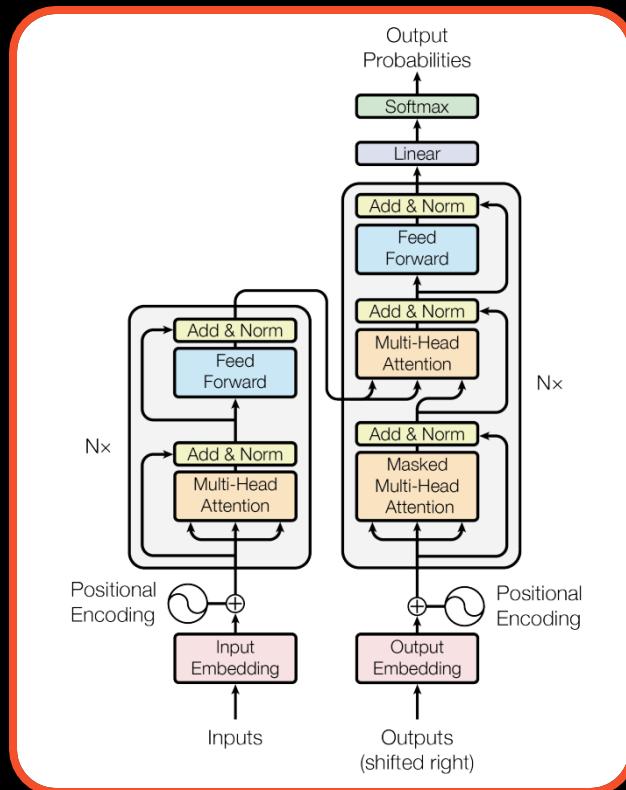
Abstract

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We propose a new simple network architecture, the Transformer, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over the existing best results, including ensembles, by over 2 BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.8 after training for 3.5 days on eight GPUs, a small fraction of the training costs of the best models from the literature. We show that the Transformer generalizes well to other tasks by applying it successfully to English constituency parsing both with large and limited training data.

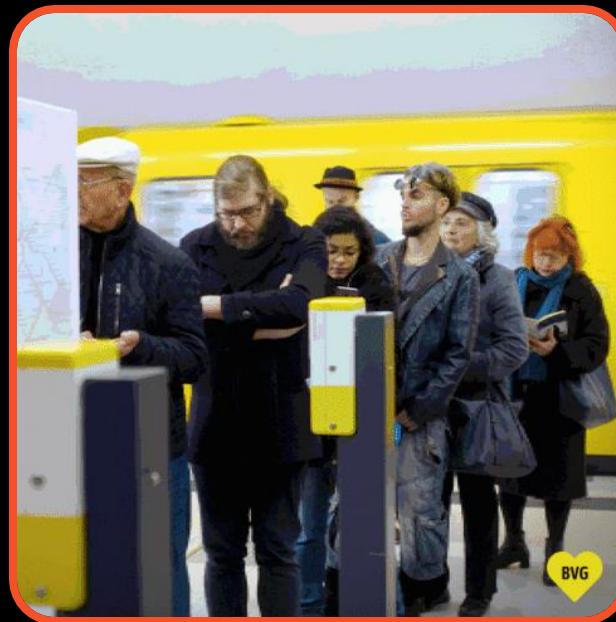
Transformer

Encoder

Decoder



Wie funktioniert die Veränderung?



1. *Embedding*



$$\begin{bmatrix} -4 \\ 3 \\ 2 \\ 1 \\ 4 \\ 5 \\ \dots \end{bmatrix}$$



$$\begin{bmatrix} -4 \\ -2 \\ 2 \\ 1 \\ -3 \\ 5 \\ \dots \end{bmatrix}$$

2. Adding positional Encoding

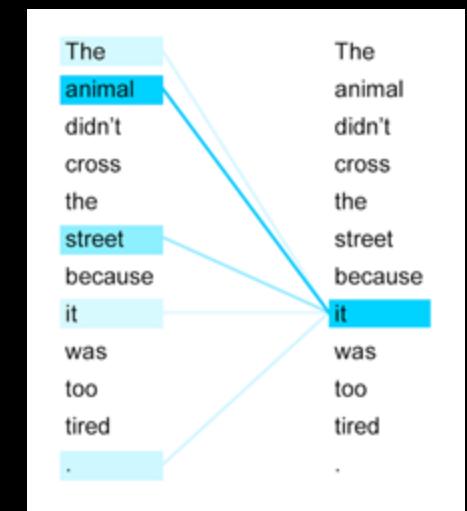
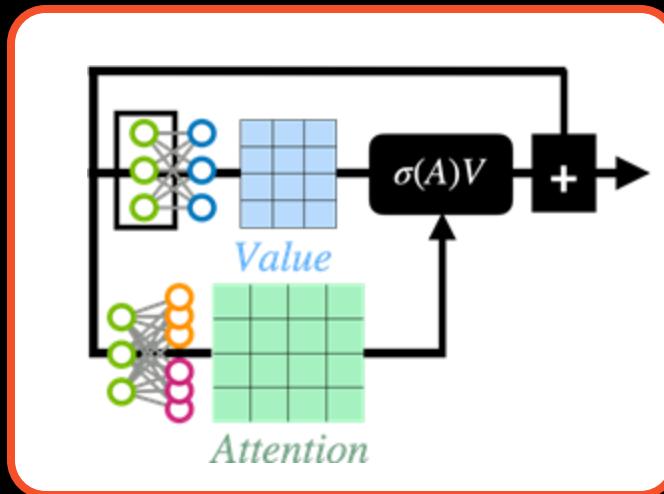


$$\begin{bmatrix} 1 \\ -4 \\ 3 \\ 2 \\ 1 \\ 4 \\ 5 \\ \dots \end{bmatrix}$$

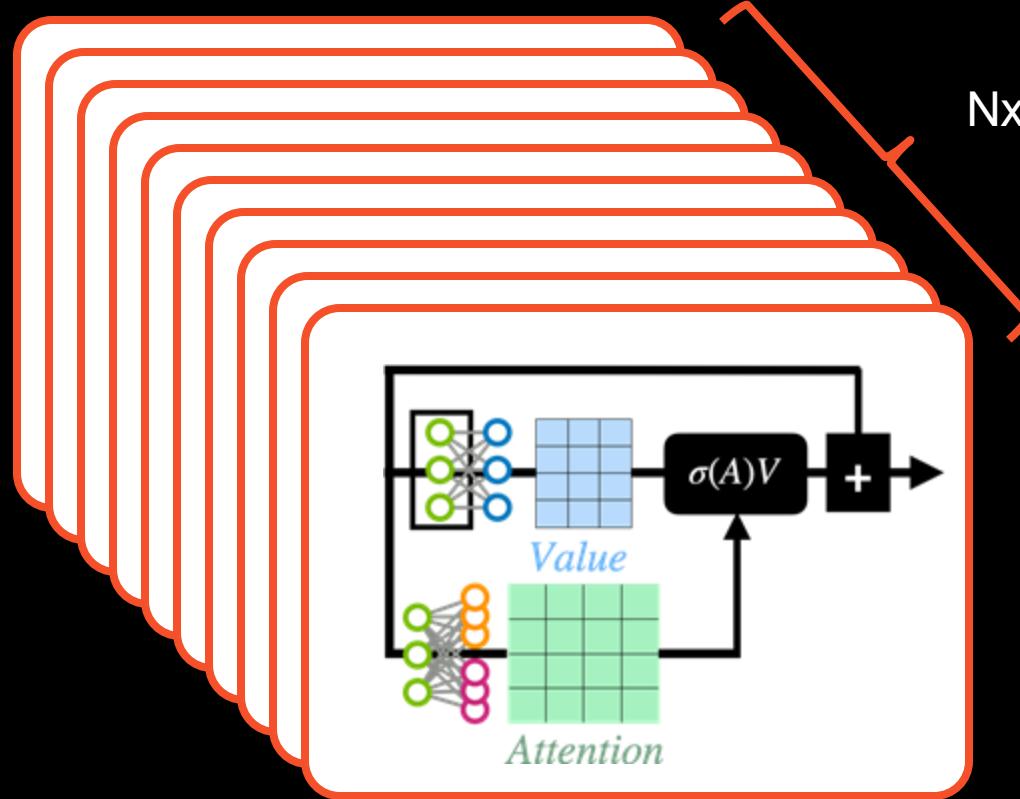


$$\begin{bmatrix} 1 \\ -4 \\ -2 \\ 2 \\ 1 \\ -3 \\ 5 \\ \dots \end{bmatrix}$$

selfAttention Mechanism



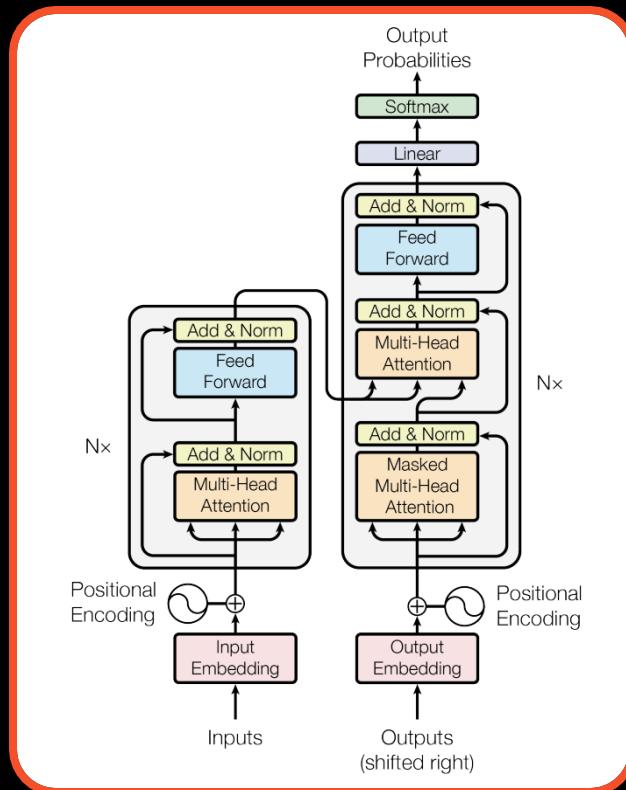
Multi-Head Attention Mechanism



Transformer

Encoder

Decoder



Die drei Gründe für den Erfolg

Datenmenge

Training auf alles

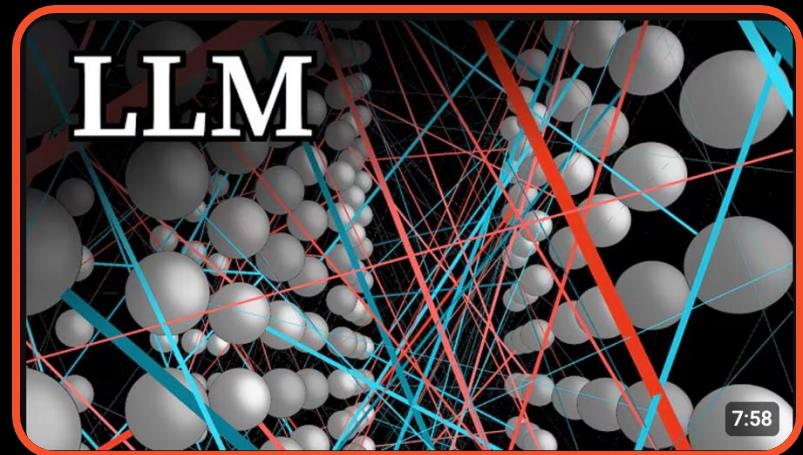
Rechenleistung

GPU's und nicht CPU's

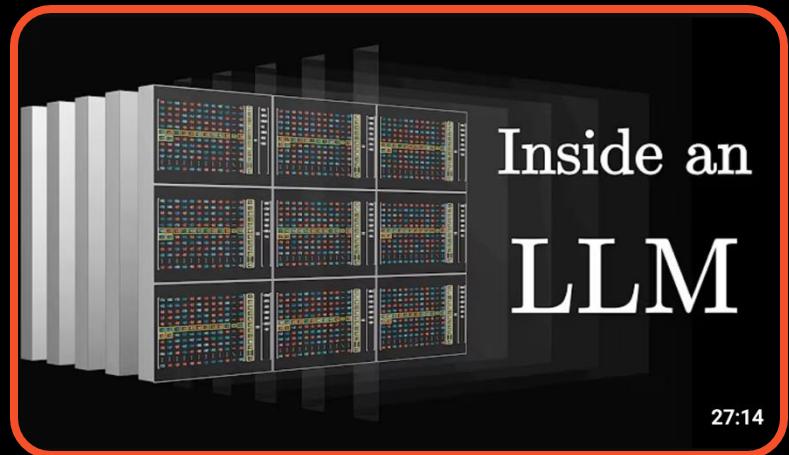
Modellgröße

Mehr Parameter

more?



<https://www.youtube.com/watch?v=LPZh9BOjkQs>



<https://www.youtube.com/watch?v=wjZofJX0v4M>



03

Multimodal

How to use AI?



<https://www.youtube.com/watch?v=wv779vmyPVY>



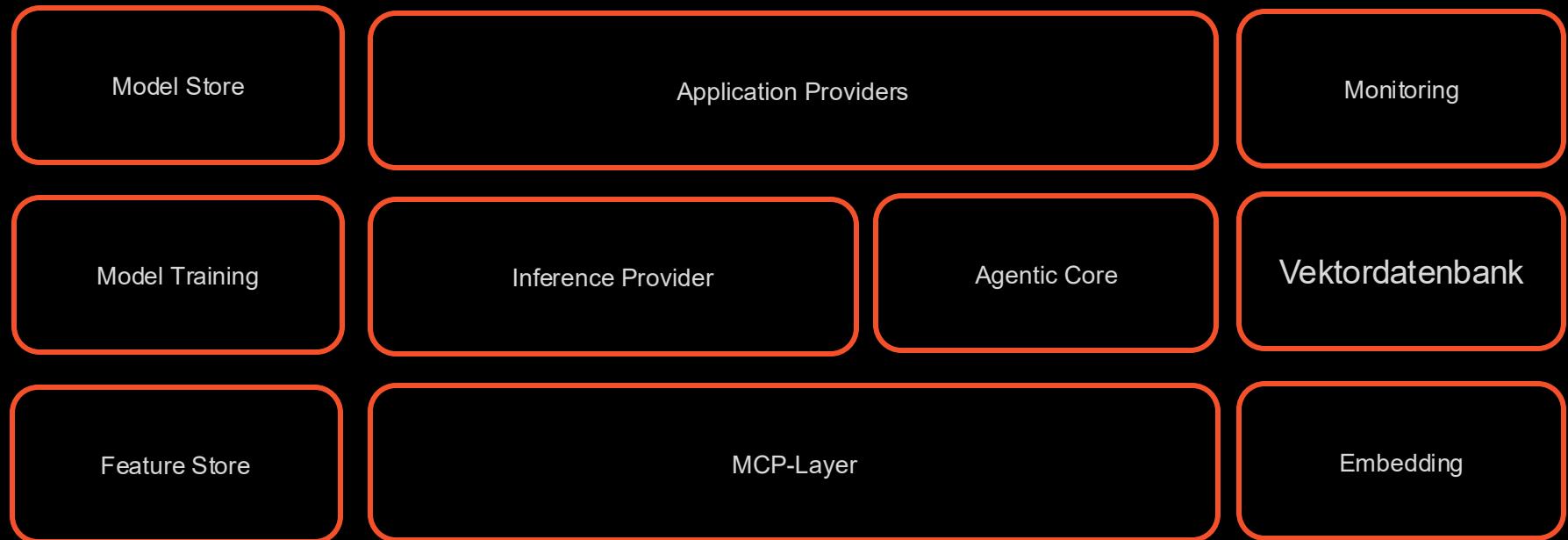
<https://www.youtube.com/watch?v=yM0mmnjy3sE>



03

KI-Stack

KI-Stack



HuggingFace

The screenshot shows the Hugging Face platform's main interface. At the top left, there's a search bar with the placeholder "Try HuggingChat Omni – Chat with AI 🤖". Below the search bar is a large yellow emoji of a smiling face with hands clasped together. The main title "The AI community building the future." is displayed prominently in large white font. Below the title, a subtitle reads "The platform where the machine learning community collaborates on models, datasets, and applications." Two buttons are visible: "Explore AI Apps" and "Browse 1M+ models". The top navigation bar includes tabs for "Tasks", "Libraries", "Datasets", "Languages", "Licenses", and "Other". A search bar "Filter Tasks by name" is located above the task categories. The tasks are categorized into several groups: "Multimodal" (Text-to-Image, Image-to-Text, Text-to-Video, Visual Question Answering, Document Question Answering, Graph Machine Learning), "Computer Vision" (Depth Estimation, Image Classification, Object Detection, Image Segmentation, Image-to-Image, Unconditional Image Generation, Video Classification, Zero-Shot Image Classification), "Natural Language Processing" (Text Classification, Token Classification, Table Question Answering, Question Answering, Zero-Shot Classification, Translation, Summarization, Conversational, Text Generation, Text2Text Generation, Sentence Similarity), "Audio" (Text-to-Speech, Automatic Speech Recognition, Audio-to-Audio, Audio Classification, Voice Activity Detection), "Tabular" (Tabular Classification, Tabular Regression), and "Reinforcement Learning" (Reinforcement Learning, Robotics). On the right side, there's a sidebar titled "Models" showing a list of available models, such as "meta-llama/Llama-2-70b", "stabilityai/stable-diffusion-xl-base-0.9", "openchat/openchat", "illyasviel/ControlNet-v1-1", "cerspense/zeroscope_v2_XL", "meta-llama/Llama-2-13b", "tiiuae/falcon-40b-instruct", "WizardLM/WizardCoder-15B-V1.0", "CompVis/stable-diffusion-v1-4", "stabilityai/stable-diffusion-2-1", and "Salesforce/xgen-7b-8k-inst". Each model entry includes its name, description, and metrics like text generation, size, and number of stars.

top 5 common AI Platform Challenges

1

Varying skillsets and tooling needs between ML Researchers, ML Practitioners, Data Engineers, and DevOps.

2

Avoiding cloud/vendor lock-in is a massive challenge between cloud, data center, and edge requirements

3

Moving from experimentation to production is slow and requires heavy manual intervention

4

Data is siloed and workflows get isolated with complete lack of reproducibility

5

Difficult to onboard new teams or use cases, often starting from scratch with own platform and processes

WHOA!



This can be the part of the presentation where
you introduce yourself, write your email...

DO YOU NEED LONGER TEXT?

Mercury is the closest planet to the Sun and the smallest one in the entire Solar System. This planet's name has nothing to do with the liquid metal, since Mercury was named after the Roman messenger god. Despite being closer to the Sun than Venus, its temperatures aren't as terribly hot as that planet's. Its surface is quite similar to that of Earth's Moon, which means there are a lot of craters and plains

Speaking of craters, many of them were named after artists or authors who made significant contributions to their respective fields. Mercury takes a little more than 58 days to complete its rotation, so try to imagine how long days must be there! Since the temperatures are so extreme, albeit not as extreme as on Venus, and the solar radiation is so high, Mercury has been deemed to be non-habitable for humans



THE SLIDE TITLE

GOES HERE!



Do you know what helps you make your point crystal clear? Lists like this one:

- They're simple
- You can organize your ideas clearly
- You'll never forget to buy milk!

And the most important thing: the audience won't miss the point of your presentation



YOU NEED TO DIVIDE THE CONTENT?



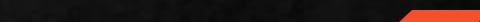
Mercury

Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than the Moon



Venus

Venus has a beautiful name and is the second planet from the Sun. It's hot and has a poisonous atmosphere



DIVIDE THE CONTENT IN FOUR IDEAS



Mars

Mars is actually a very cold place



Venus

Venus has extremely high temperatures



Jupiter

Jupiter is the biggest planet of them all



Saturn

Saturn is a gas giant and has several rings



REVIEWING CONCEPTS IS USEFUL

Mars

Despite being red,
Mars is a cold place

Mercury

Mercury is the closest
planet to the Sun

Venus

Venus has extremely
high temperatures

Saturn

Saturn is a gas giant
with several rings

Neptune

Neptune is the farthest
planet from the Sun

Jupiter

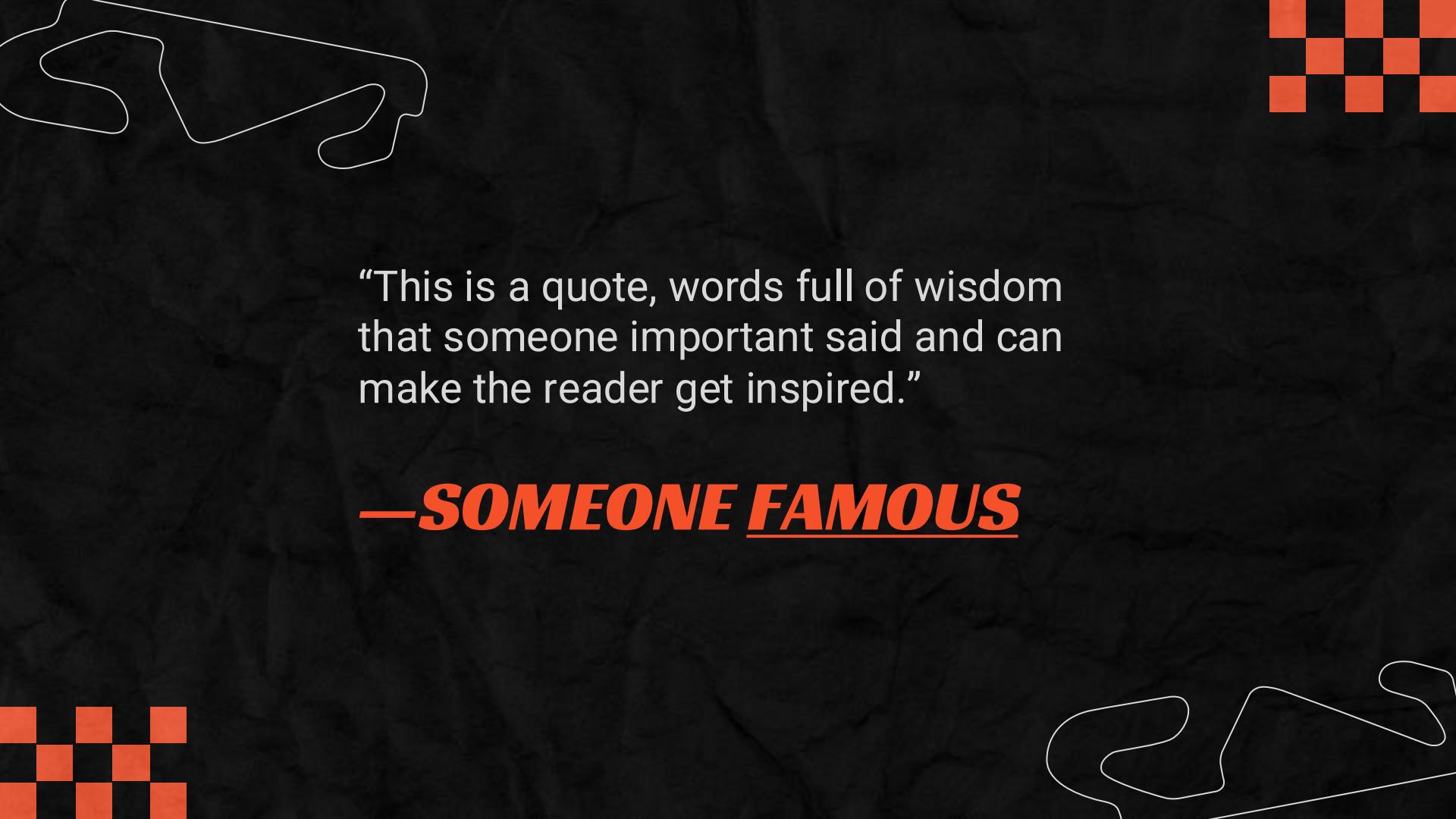
Jupiter is the biggest
planet of them all





AWESOME

WORDS



“This is a quote, words full of wisdom that someone important said and can make the reader get inspired.”

—***SOMEONE FAMOUS***



**A PICTURE IS WORTH
A THOUSAND WORDS**



A PICTURE REINFORCES THE CONCEPT

Images reveal large amounts of data, so remember: use an image instead of a long text. Your audience will appreciate it



02

NAME OF THE SECTION

You can enter a subtitle here if you need it

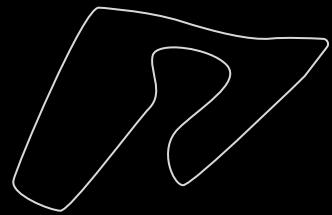




4,675,136

Big numbers catch your audience's attention





9h 55m 23s

Jupiter's rotation period



333,000



The Sun's mass compared to Earth's

386,000 km

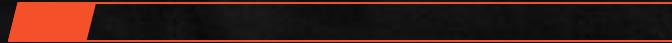
Distance between Earth and the Moon

LET'S USE SOME PERCENTAGES

Mercury

Mercury is the closest planet to the Sun and the smallest of them all

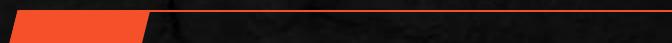
15%



Venus

Venus has a beautiful name and is the second planet from the Sun

20%



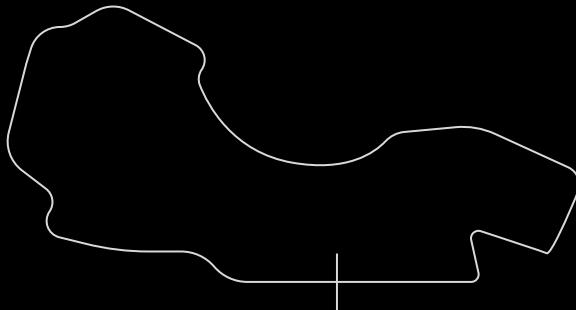
Mars

Despite being red, Mars is actually a cold place. It's full of iron oxide dust

65%



CIRCUIT RELEVANT INFORMATION



Circuit name

Distance: XXX km

City: Mercury

Description

Jupiter is a gas giant and the biggest planet in the entire Solar System

Last standings

1st position	2nd position	3rd position
Pilot name	Pilot name	Pilot name

Better times

Pilot name	←→	01:21:08
Pilot name	←→	00:59:10
Pilot name	←→	01:32:43

NEXT RACES CALENDAR

Month, year						
S	M	T	W	T	F	S
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Saturday 6th

Circuit location

Neptune is far away from us

Friday 18th

Circuit location

Mars is made of basalt

Tuesday 29th

Circuit location

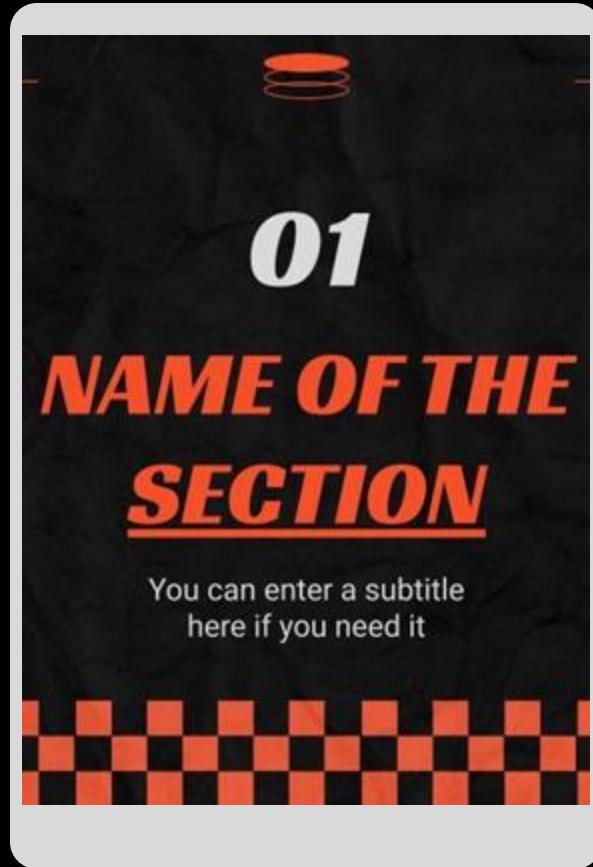
Earth has human life



COMPUTER MOCKUP

You can replace the image on the screen with your own work. Just right-click on it and select "Replace image"





TABLET MOCKUP

You can replace the image on the screen with your own work. Just right-click on it and select “Replace image”





SMARTPHONE MOCKUP

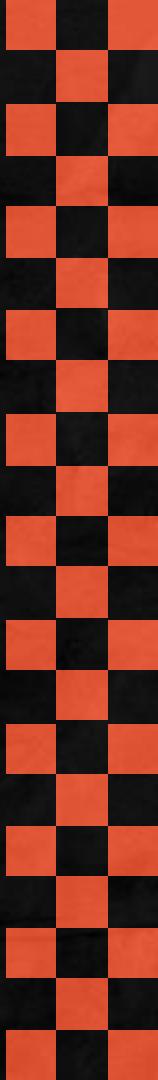
You can replace the image on the screen with your own work. Just right-click on it and select “Replace image”



03

NAME OF THE SECTION

You can enter a subtitle
here if you need it



THIS IS A MAP



Mars

Mars is actually a very cold place

Neptune

Neptune is very far away from the Sun

Jupiter

Jupiter is the biggest planet of them all

A *TIMELINE* ALWAYS WORKS WELL

2XXX

Neptune

Neptune is the farthest planet from the Sun

2XXX

Jupiter

Jupiter is the biggest planet of them all

2XXX

Earth

Earth is the blue planet and where we all live

2XXX

Venus

Venus has a beautiful name and is very hot

INFOGRAPHICS ARE USEFUL



Neptune

Neptune is the farthest planet from the Sun

Jupiter

Jupiter is the biggest planet of them all

Mars

Despite being red, Mars is actually a cold place

01

02

03



MAYBE YOU NEED A DIAGRAM



TABLES REPRESENT YOUR DATA

Racing car	Mercury	Venus	Mars
Name of the car	Yes	No	No
Name of the car	No	No	Yes
Name of the car	Yes	Yes	Yes
Name of the car	No	No	No
Name of the car	No	No	Yes
Name of the car	Yes	Yes	No

YOU CAN USE THIS GRAPH

■ **10%**

Mars

Despite being red, Mars is actually very cold

30% ■

Saturn

Saturn was named after a Roman god

□ **25%**

Venus

Venus has a beautiful name and is very hot



35% □

Jupiter

Jupiter is the biggest planet of them all

Follow the link in the graph to modify its data and then paste the new one here. [For more info, click here](#)

THIS IS ANOTHER TABLE



Pilot name	Car type	Statistics (per lap)		
Timmy Jimmy	Mercury	00:00:00	00:00:00	00:00:00
Amanda Hill	Venus	00:00:00	00:00:00	00:00:00
John Doe	Mars	00:00:00	00:00:00	00:00:00
Kaliyah Harris	Jupiter	00:00:00	00:00:00	00:00:00
Billy Johns	Saturn	00:00:00	00:00:00	00:00:00
Sarah Thomson	Earth	00:00:00	00:00:00	00:00:00



THIS IS A ROADMAP

Neptune is the farthest planet from the Sun

Saturn has a high number of moons

Mercury is the closest planet to the Sun

Earth is also known as the Blue Planet

Mars is made of basalt and is very cold

Jupiter is the biggest planet of them all

OUR TEAM

**Timmy
Jimmy**

You can speak
a bit about this
person here



**Amanda
Hill**

You can speak
a bit about this
person here

THANK YOU

Do you have any questions?

youremail@freepik.com
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ICON PACK

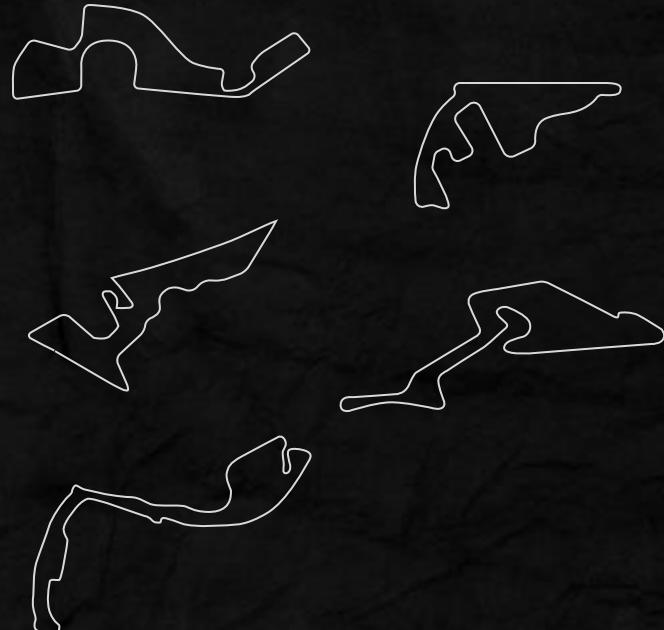


ALTERNATIVE RESOURCES

Here's an assortment of alternative resources whose style fits the one of this template:

Vectors

- [Collection of f1 racing tracks](#)
- [Collection of f1 racing tracks I](#)



RESOURCES

Did you like the resources in this template?
Get them for free at our other websites:

Icons

- Icon pack: Auto Racing | Lineal

Vectors

- Collection of f1 racing tracks
- Collection of f1 racing tracks I
- [Learn to drive landing page template](#)

Photos

- High angle wheels angle of the car
- Car being taking care of in workshop
- Car being taking care of in workshop I
- Fast yellow car on road

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Roboto

(<https://fonts.google.com/specimen/Roboto>)

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#000000

#aa3a25

#f4512b

Storyset

Create your Story with our illustrated concepts. Choose the style you like the most, edit its colors, pick the background and layers you want to show and bring them to life with the animator panel! It will boost your presentation. Check out [how it works](#).



Pana



Amico



Bro



Rafiki



Cuate

Use our editable graphic resources...

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Storyset

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Pana



Amico



Bro



Rafiki



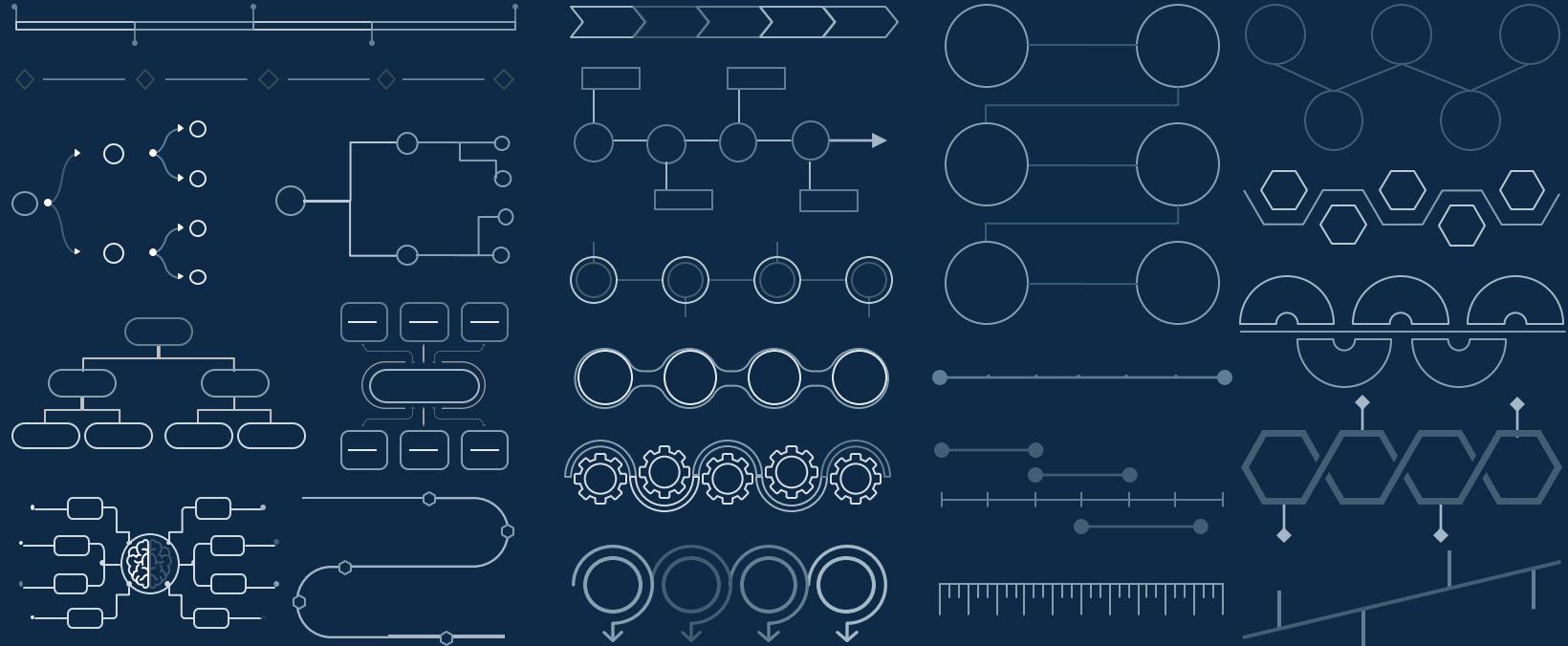
Cuate

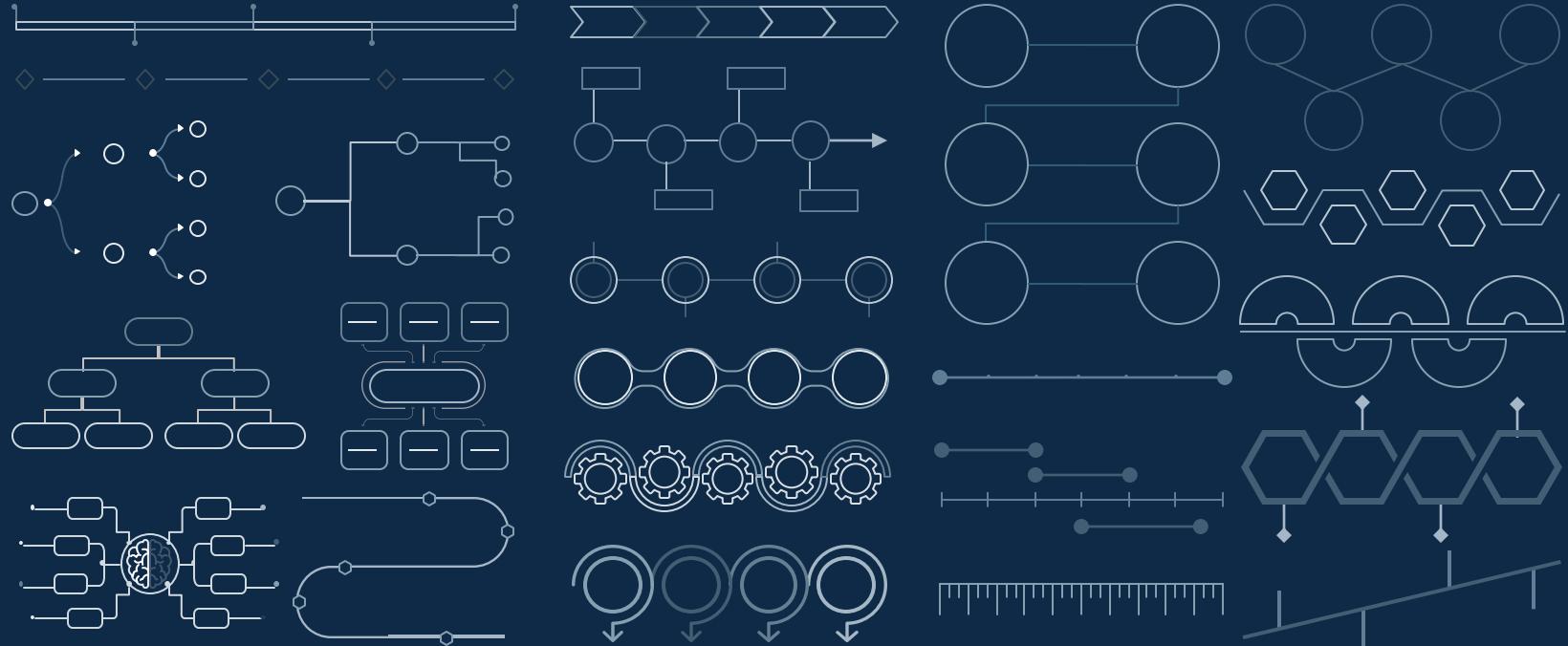
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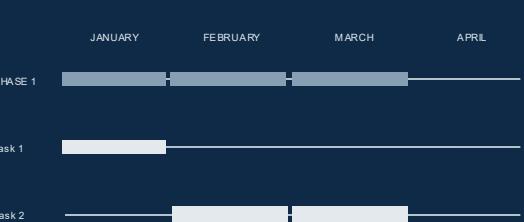
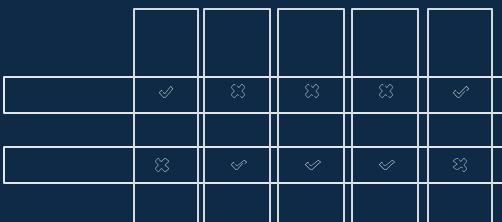
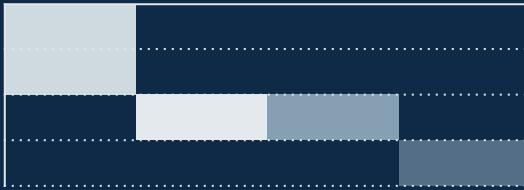
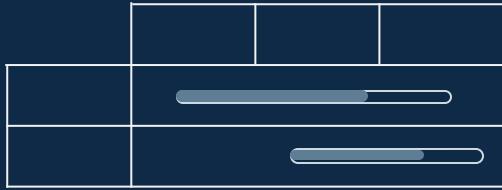
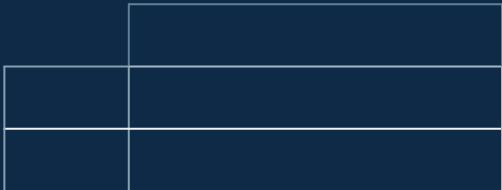
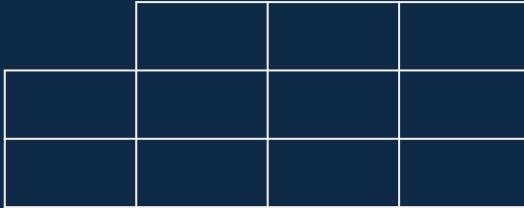
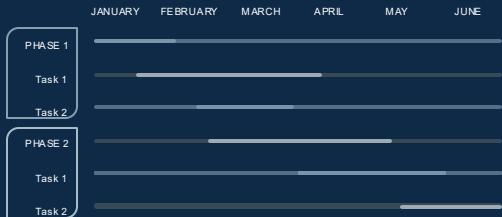
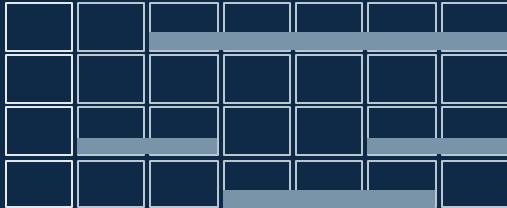
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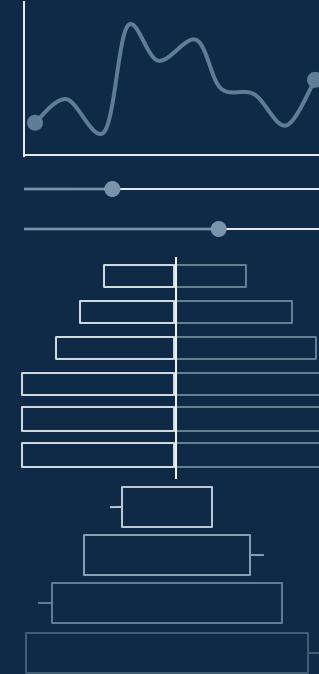
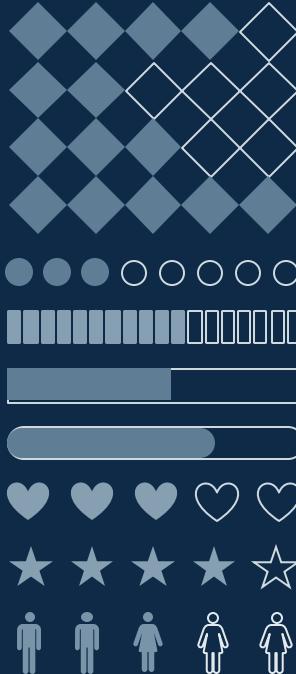
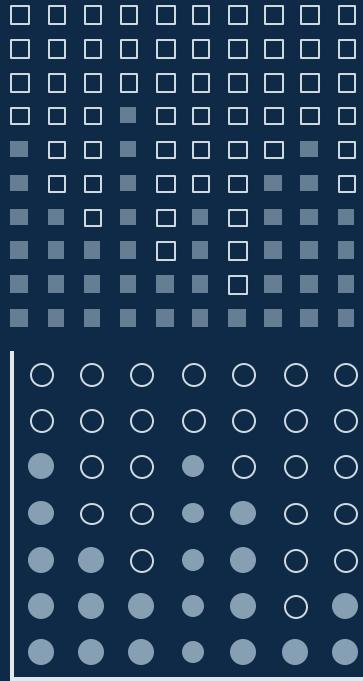












...and our sets of editable icons

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In Google Slides, you can also use **Flaticon's extension**, allowing you to customize and add even more icons.



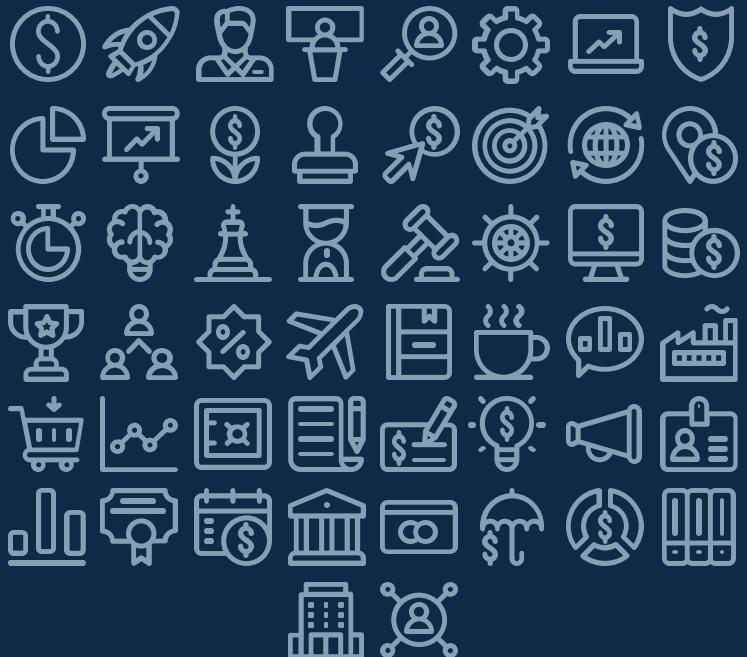
Educational Icons



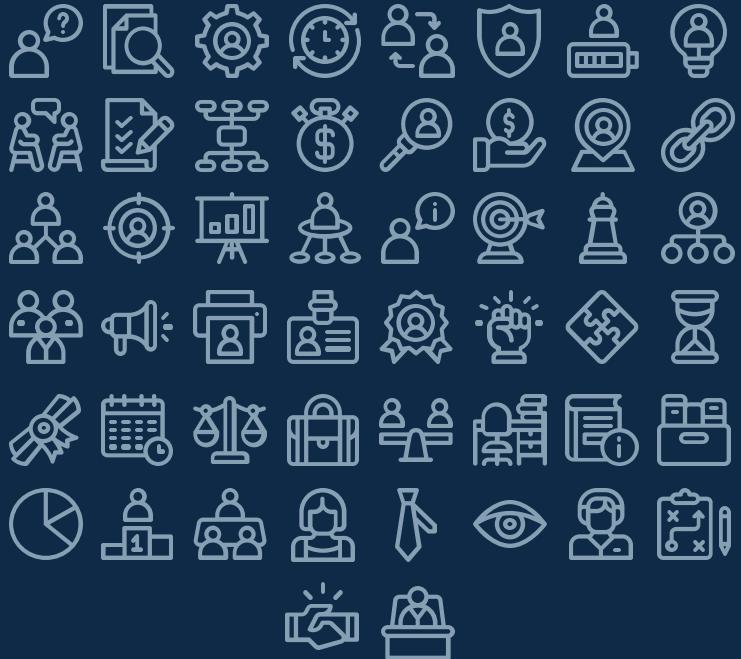
Medical Icons



Business Icons



Teamwork Icons



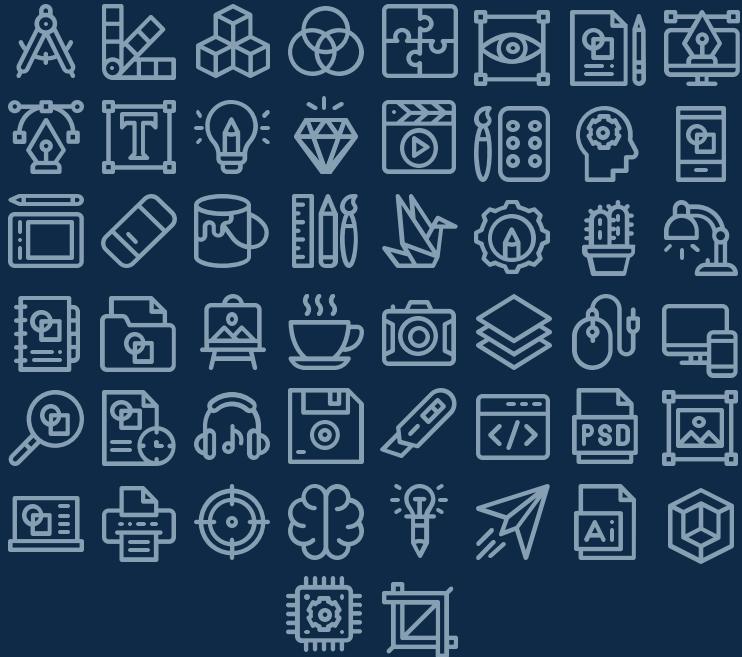
Help & Support Icons



Avatar Icons



Creative Process Icons



Performing Arts Icons



Nature Icons



SEO & Marketing Icons



