TAKEAWAYS FROM AI IN INDUSTRY

Tommaso Bendinelli

Zürich

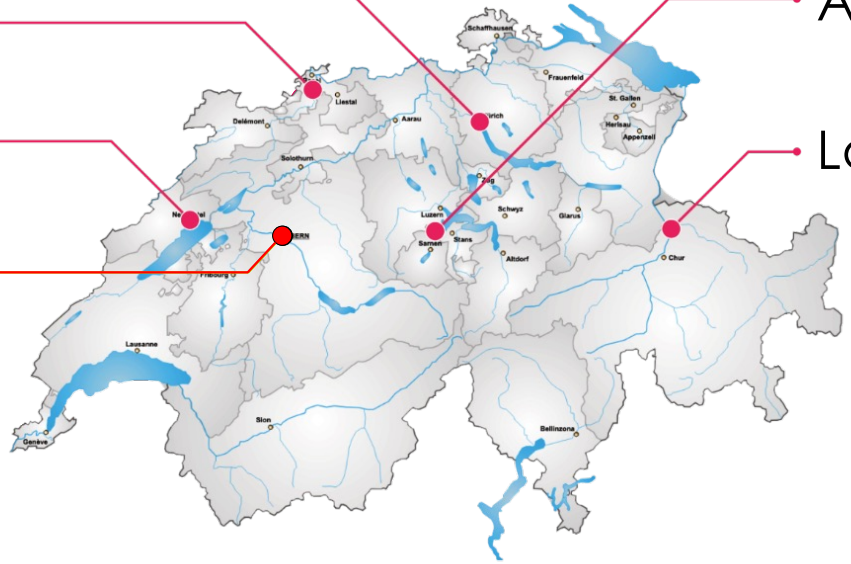
Allschwil

Neuchâtel

Bern

Alpnach

Landquart



100
Turnover (Mio CHF)

570
Staff Member

225
Industrial Clients

44
Spin-Offs (since 1984)

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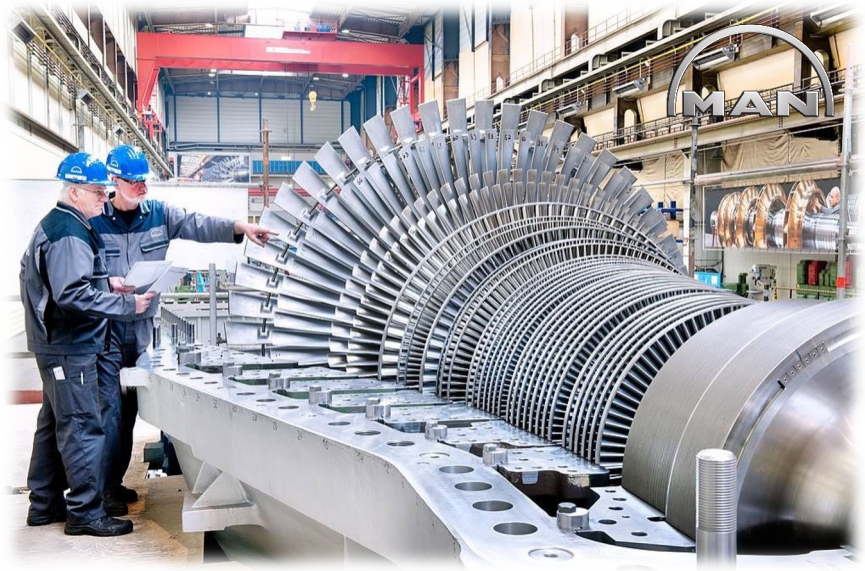
SOME PROJECT EXAMPLES: PREDICTIVE MAINTENANCE FOR CRITICAL ASSETS

Unseen instances

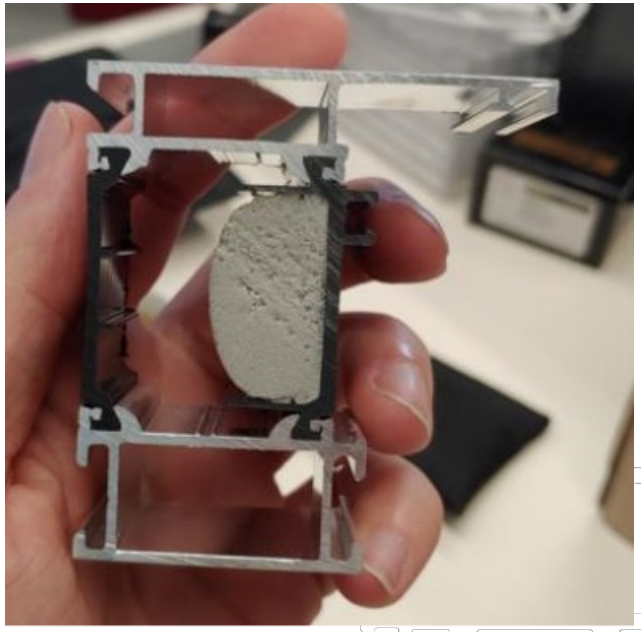
Interpretability

Operational parameters



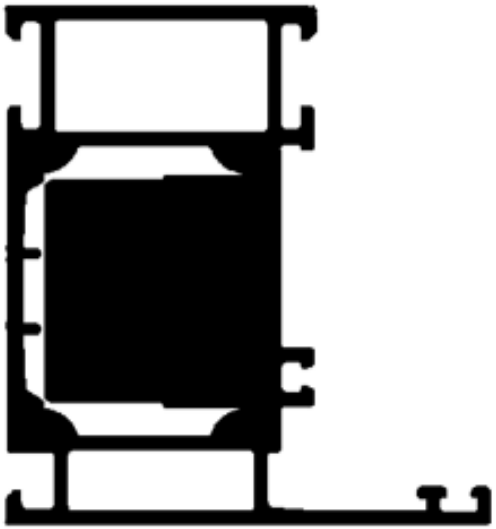
e.luterbachag
Anlagenbau für die Lackierindustrie

SOME PROJECT EXAMPLES: ALUMINUM PROFILE CLASSIFICATION ON THE GO WITH DEEP LEARNING



Predictions:

1: 395720



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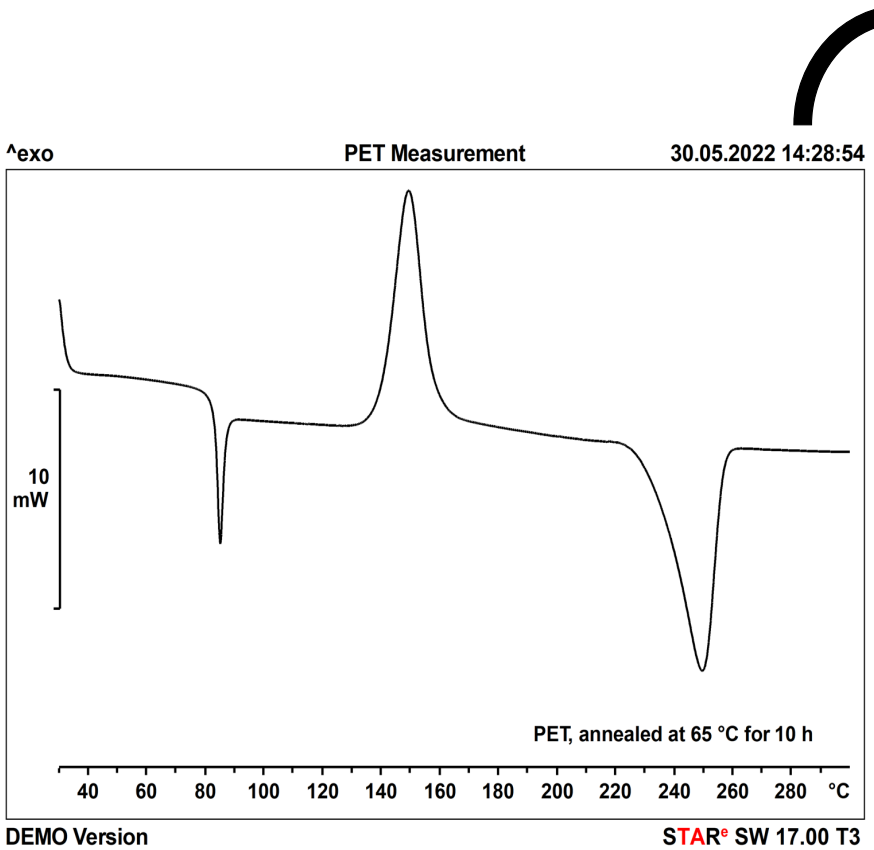
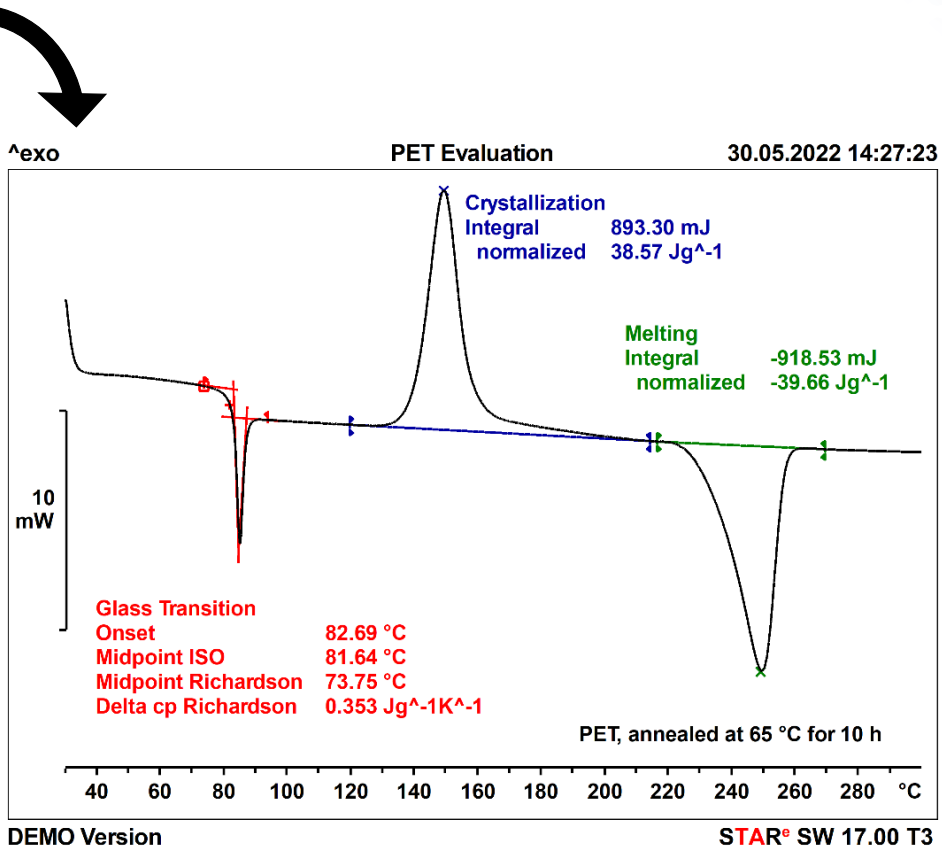
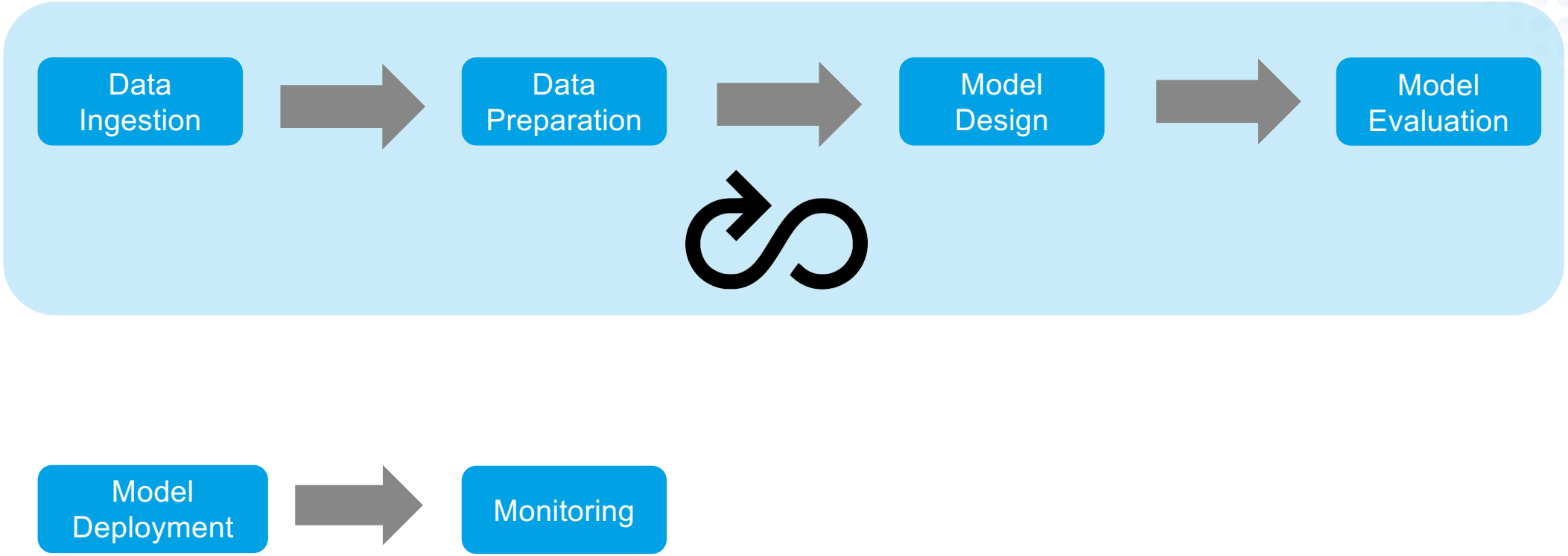
SOME PROJECT EXAMPLES: SUPPORT SYSTEM FOR IDENTIFICATION OF PHASE TRANSITIONS FROM THERMAL CURVE





FIRST TAKEAWAY, AI DEVELOPMENT FOLLOWS A WELL-DEFINED PIPELINE



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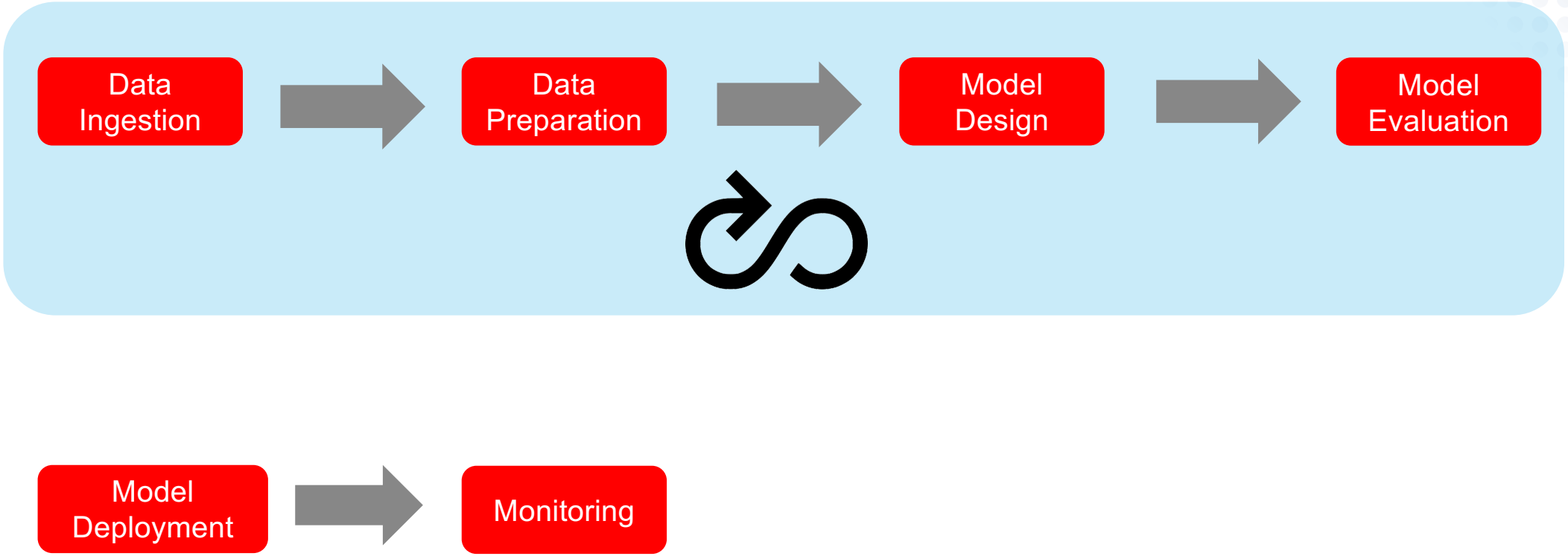
SECOND TAKEAWAY, EACH STEP IS IMPORTANT FOR ANY PROJECT



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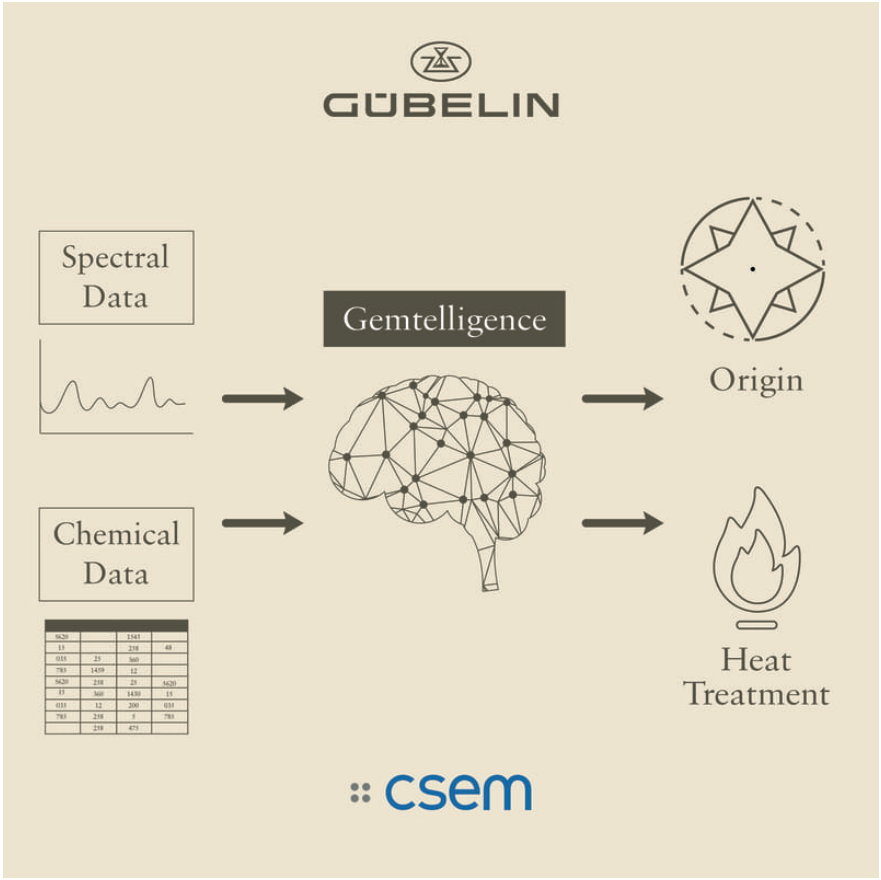
THE PIPELINE HOLDS FOR ANY PROJECT FROM THE SMALLEST TO THE LARGEST



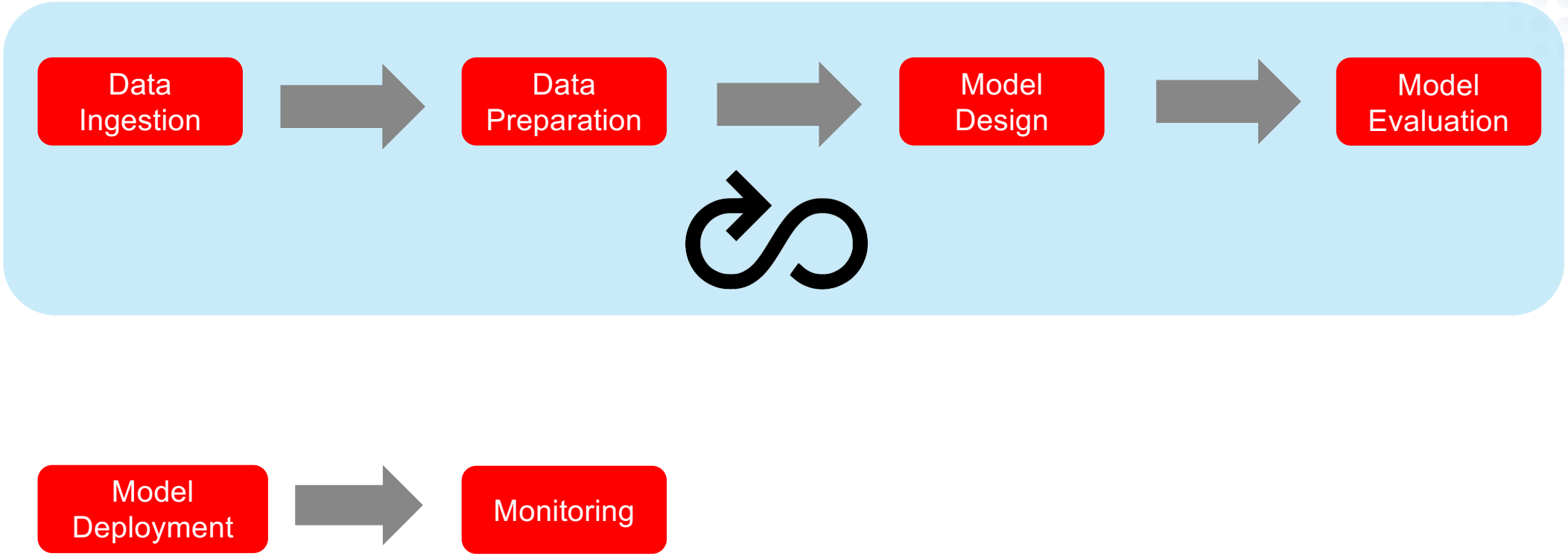
What defines the value of a gemstone?

Origin!

sold at auction for
US$ 6,900,000

(same stones from **Madagascar**:
below US$ 1,000,000)

Bracelet with nine sapphires
from **Kashmir**


Data Ingestion
Data Preparation
Model Design
Model Evaluation
Model Deployment
Monitoring

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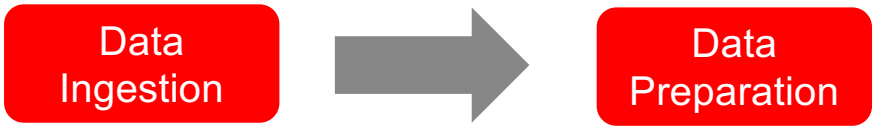
DATA COLLECTION AND PREPARATION IS OFTEN AN OVERLOOKED STEP



Gemtelligence

3'000 Gemstones collected from over 10 years from multiple labs in different format

Data often is noisy and need to be clean and filtered

CHAT-GPT

Web scraping

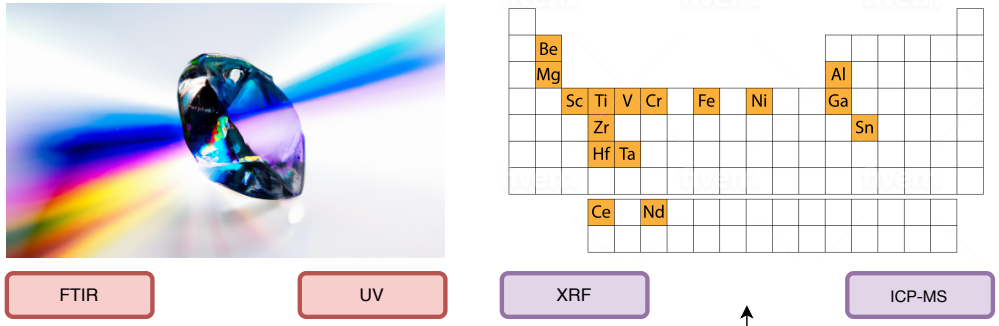
Data ingestion and filtering

GEMTELLIGENCE IS A DEEP LEARNING SOLUTION AND CHAT-GPT IS A LARGE LANGUAGE MODEL

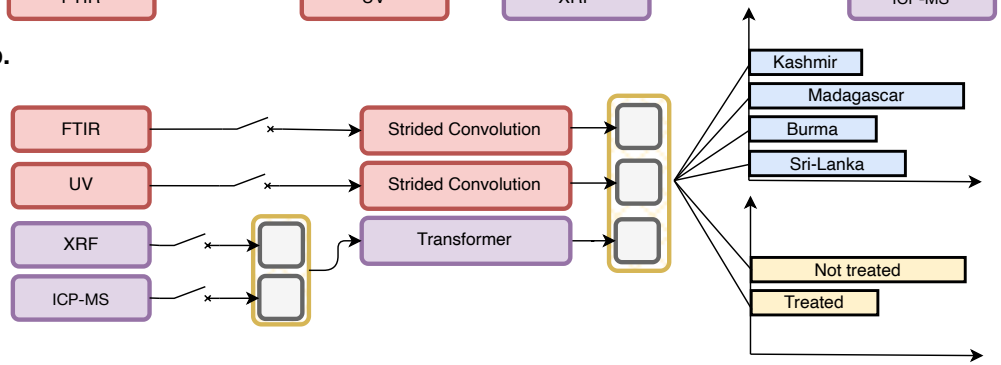
Model Design

Gemtelligence

a.



b.



CHAT-GPT

- Standard architecture but insanely scaled up, which brought many engineering challenges

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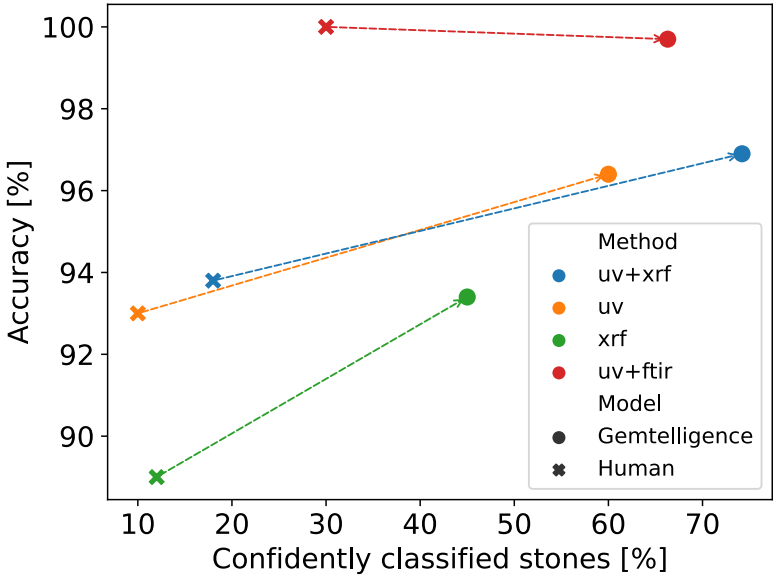
OFTEN, MEASURING ACCURACY IS NOT THE RIGHT METRIC

Model Evaluation

Gemtelligence



CHAT-GPT

- A lot of analysis about the model ability to generate correct when the model seems to be confident about a topic
- Multiple benchmarks for evaluating ChatGPT3 to humans in various domains

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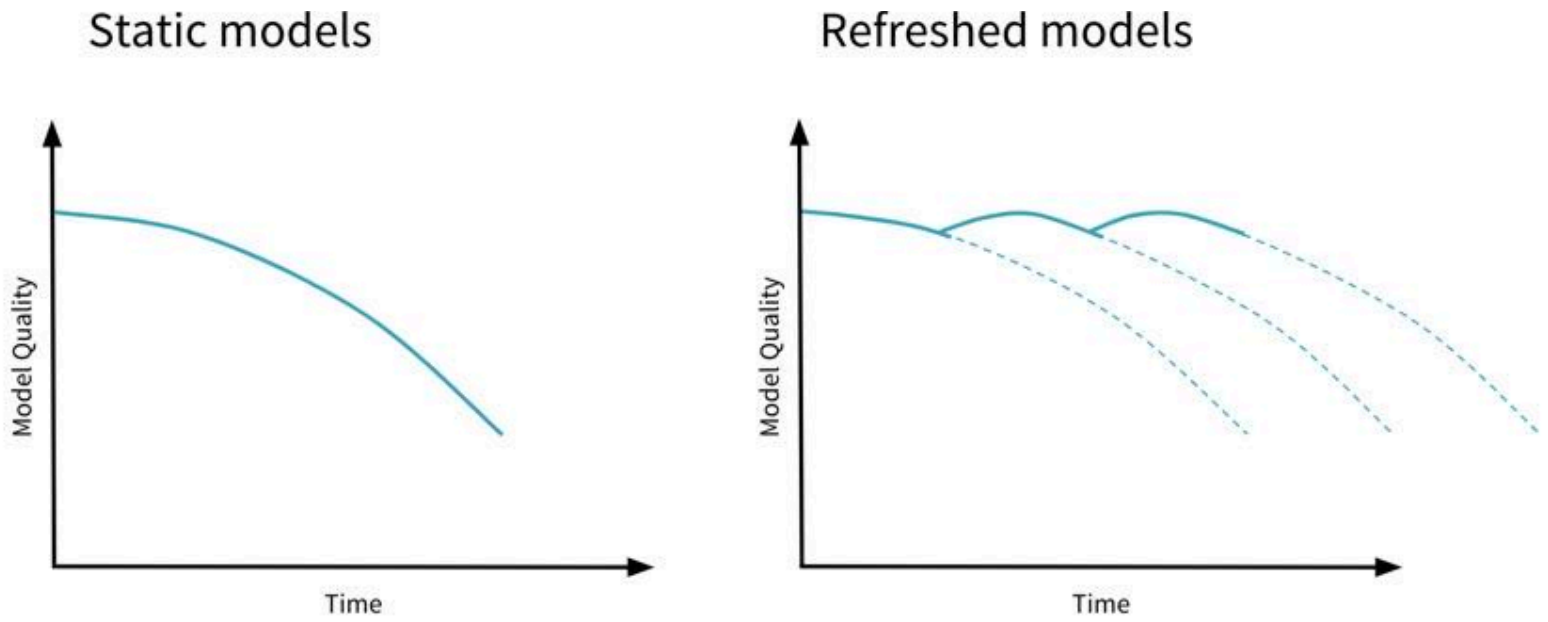
MODEL TENDS TO “AGE” AS THE DATA DISTRIBUTION CHANGES OVER TIME, BOTH SMALL AND BIG MODELS

Model Deployment → Monitoring



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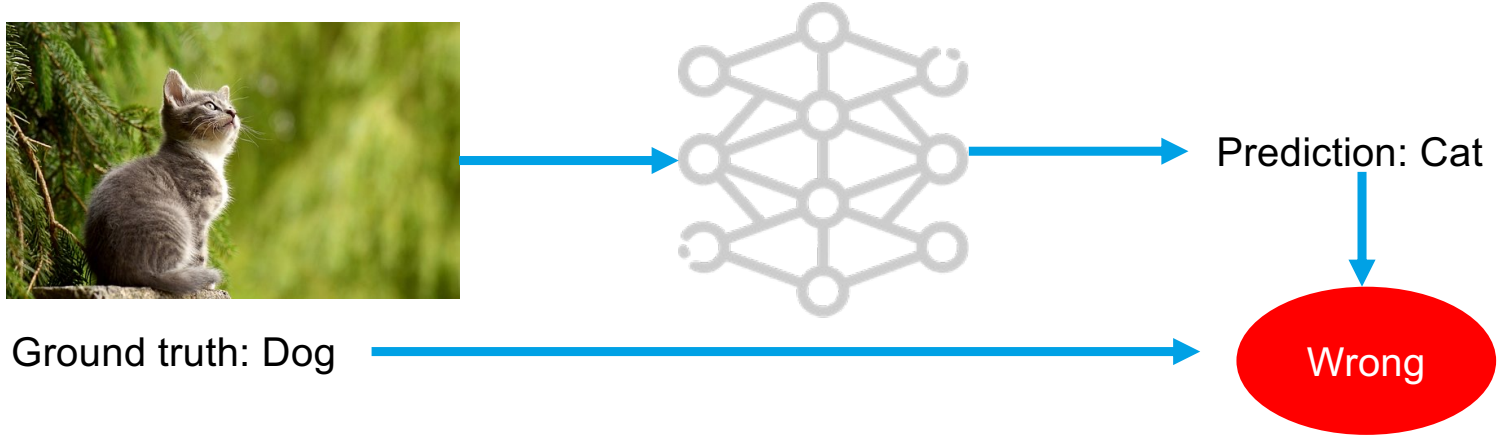
IS THERE ANY GENERAL PRINCIPLE THAT IS GOOD FOR ANY ML PROJECT?

YES!

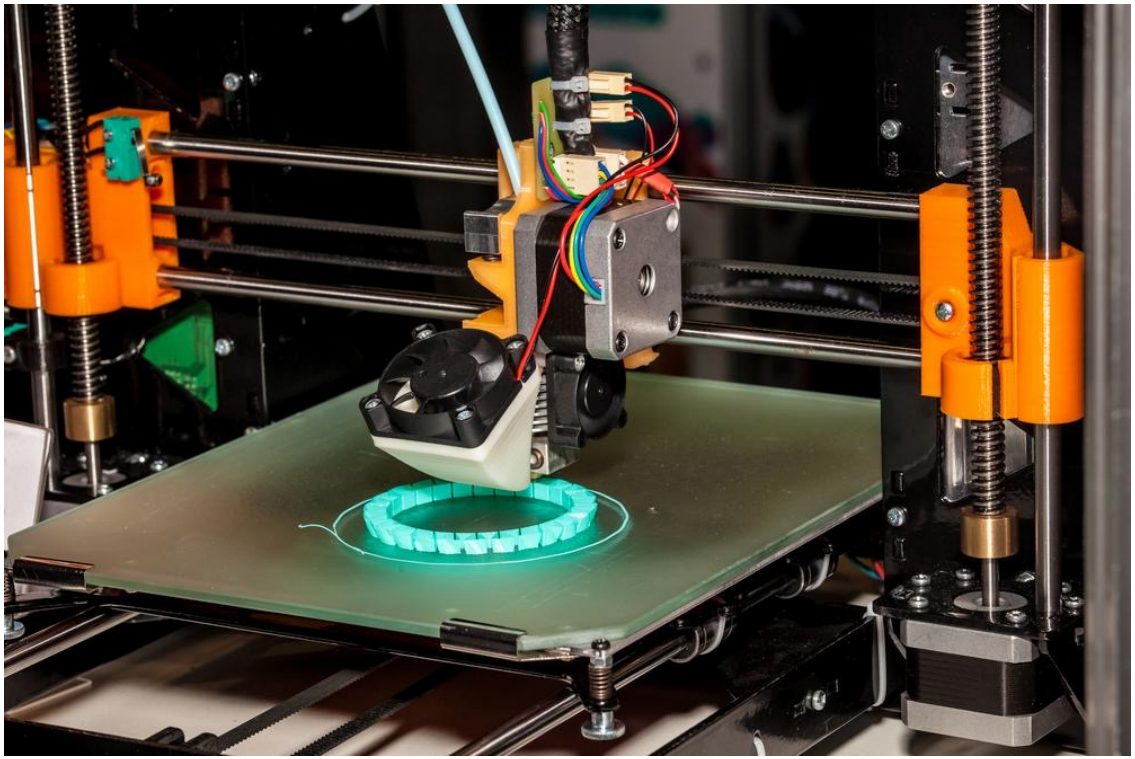
YOU NEED GOOD DATA TO TEST YOUR MODEL!

- Good amount of **quality** examples from each class are necessary

- Testing must not be misslabel, otheriwise it corrupts our intepretations

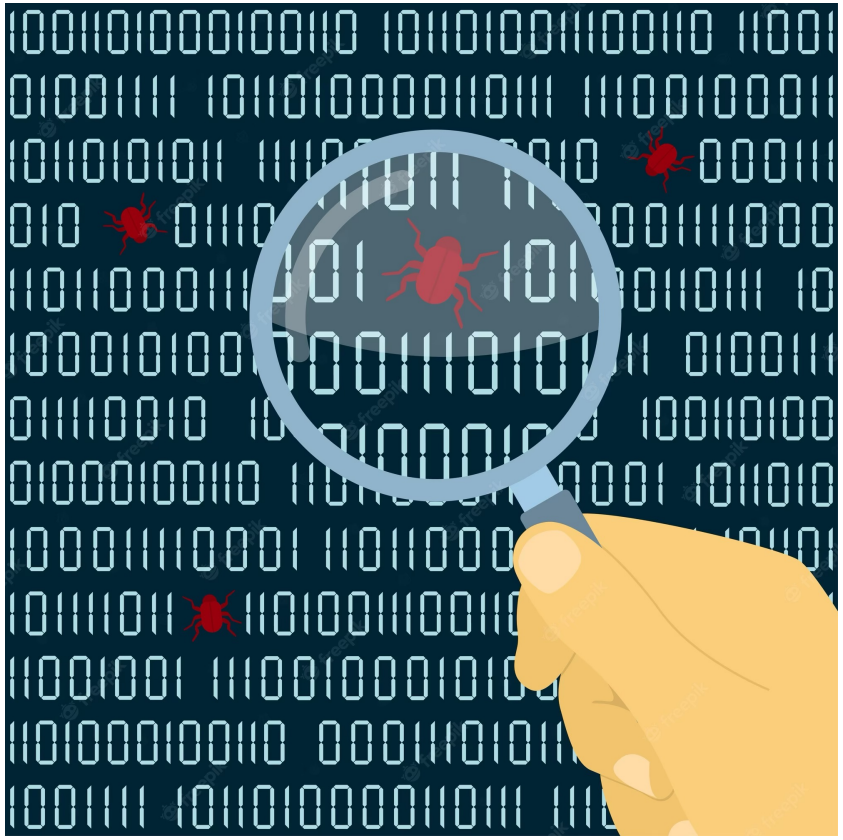


ESTABLISH WAYS TO BE FAST IN PROTOTYPING AND ITERATING OVER SOLUTIONS



- Choose the right tools
- Avoid unecesserary overheads

ESTABLISH APPROACHES FOR IDENTIFYING BUGS AND ISSUES



- Critically think about the results

THANK YOU