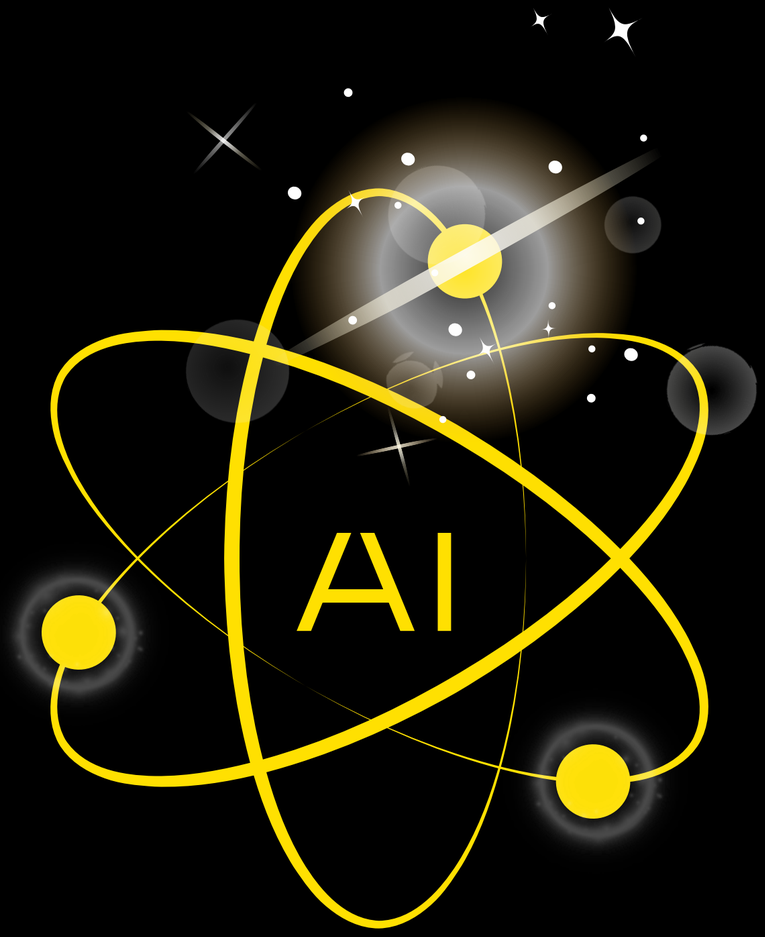
GenAI In Action

Bart van Nierop

GENAI IN ACTION

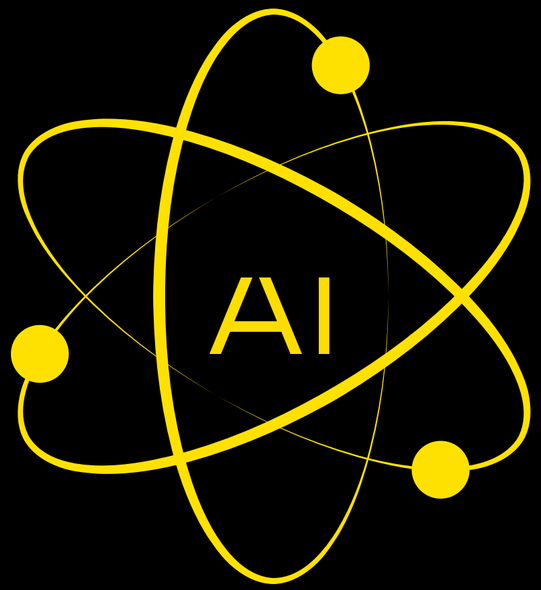
REAL-WORLD SOLUTIONS



WELCOME

We're glad you joined us!

WHY AI MATTERS TODAY

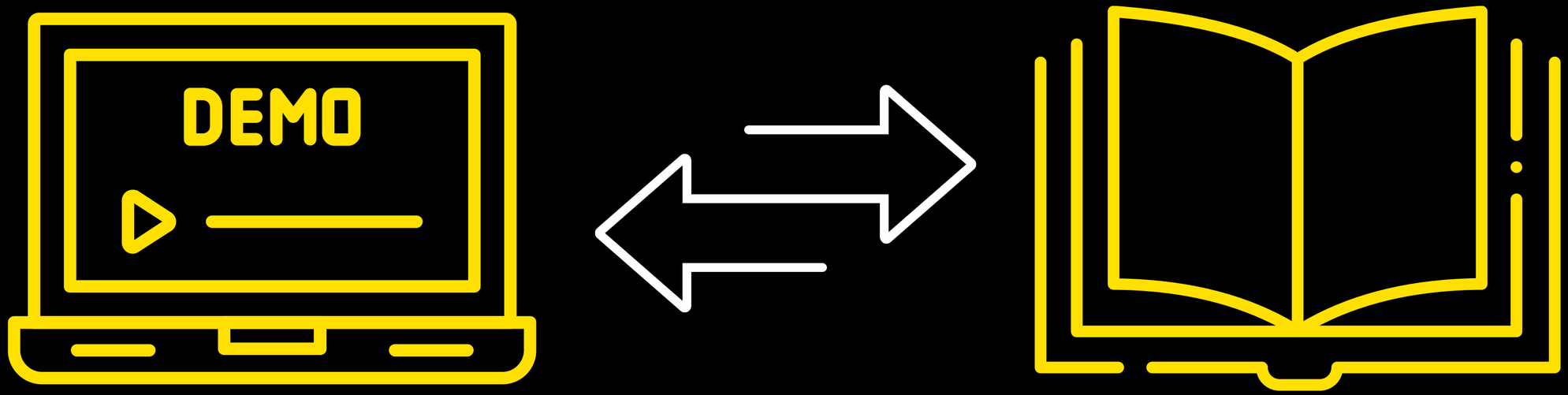


Massive impact across industries

Faster → **Smarter** → **More efficient**

AI tools and models are real and ready to use

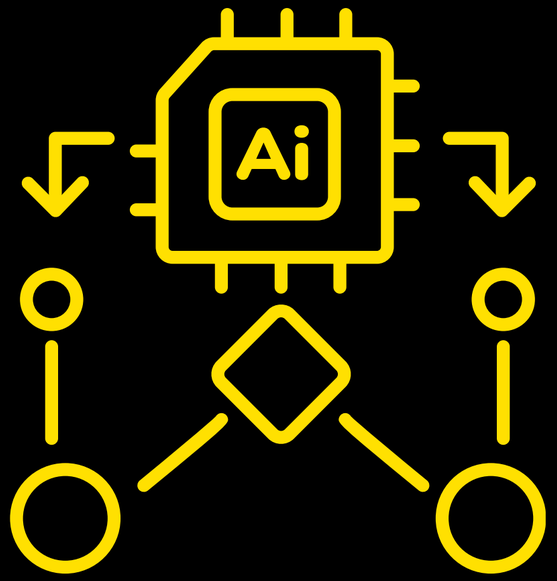
WHAT YOU CAN EXPECT TODAY



Real-world AI examples

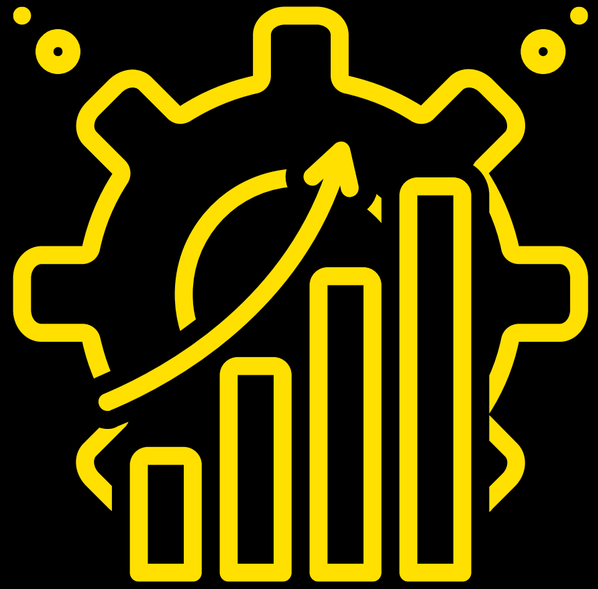
High-level overview

WHY THIS MATTERS TO YOU



Learn how to use AI
in your workflows

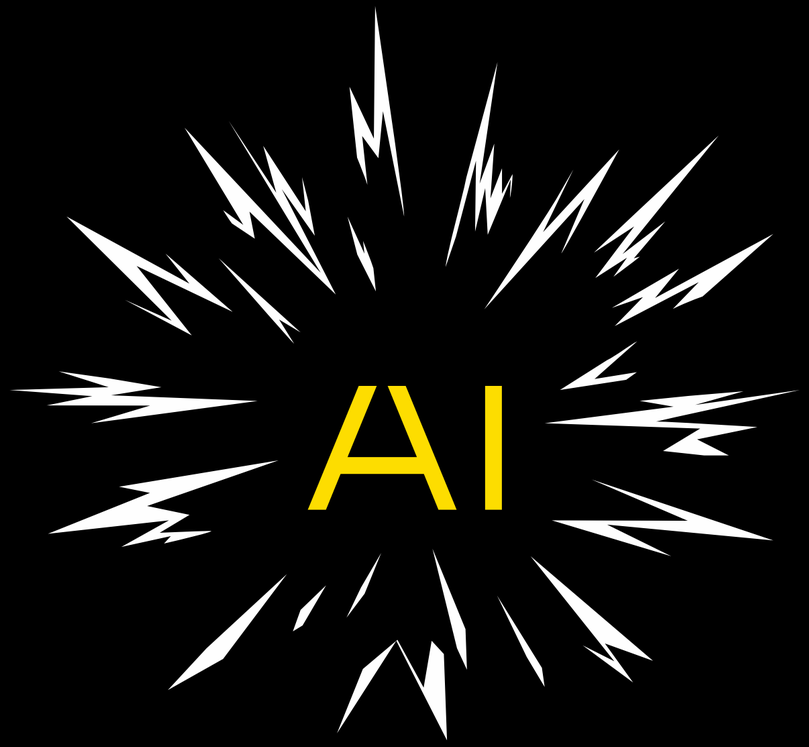
Get practical examples of
finding and using models



Let AI help you to make your
work more efficient

AI IN ACTION

Real-World Applications



- AI is already making a significant impact
- These are real, practical AI applications
- Many of these tools are already in use today

REAL WORLD EXAMPLES

DaVinci Resolve

Lumen5

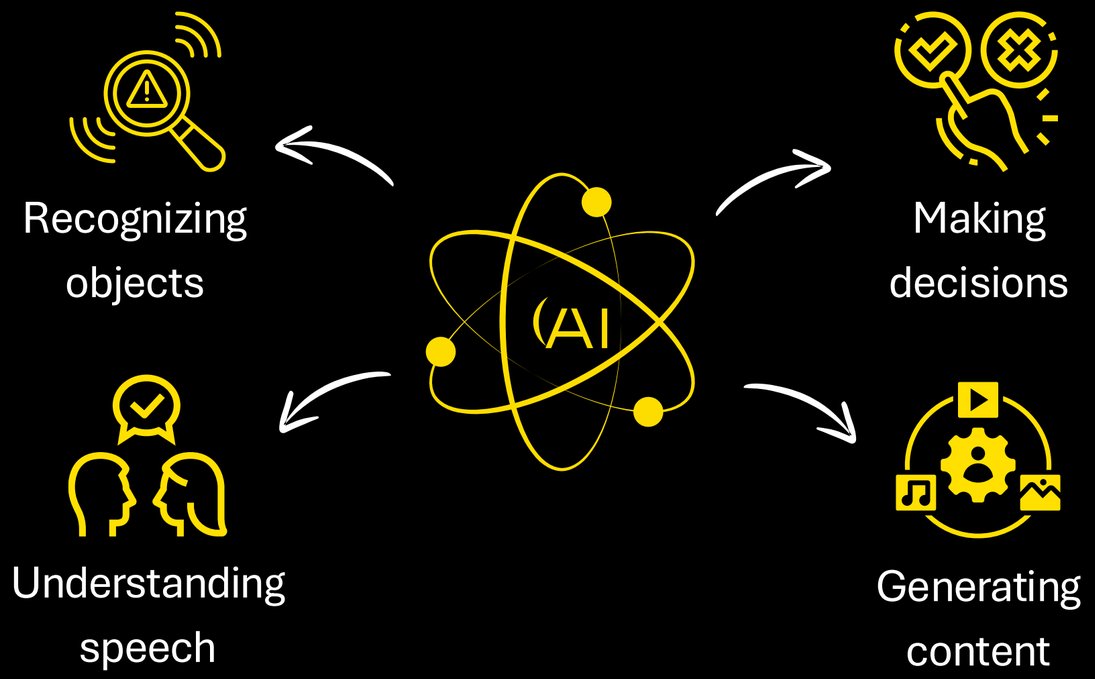
LiquidText

RunwayML

Synthesia

BeMyEyes

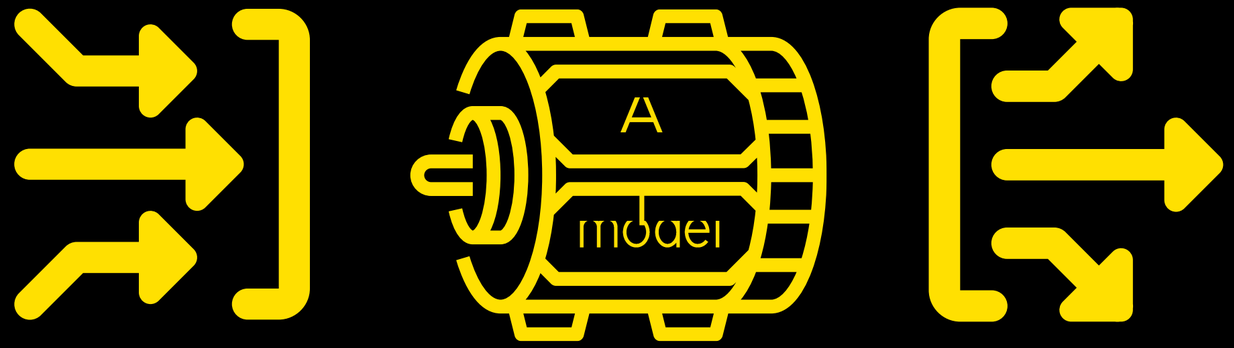
WHAT IS AI?



AI: Science of teaching machines to perform tasks that require human intelligence

HOW DOES AI LEARN?

Data input



Predictions & Decisions

1

AI learns through models, which are like mathematical formules or recipes

2

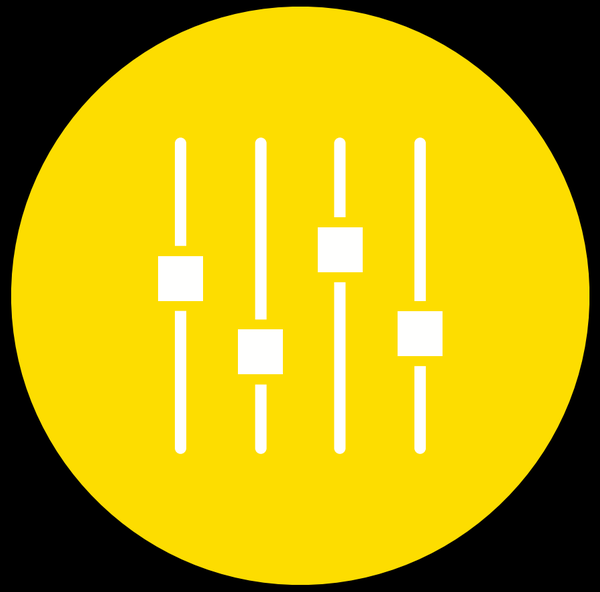
Model processes data to make predictions or decisions

3

AI adjusts its parameters, learning from the data to improve its accuracy

KEY ELEMENTS

Parameters



Features are weighted
differently during training

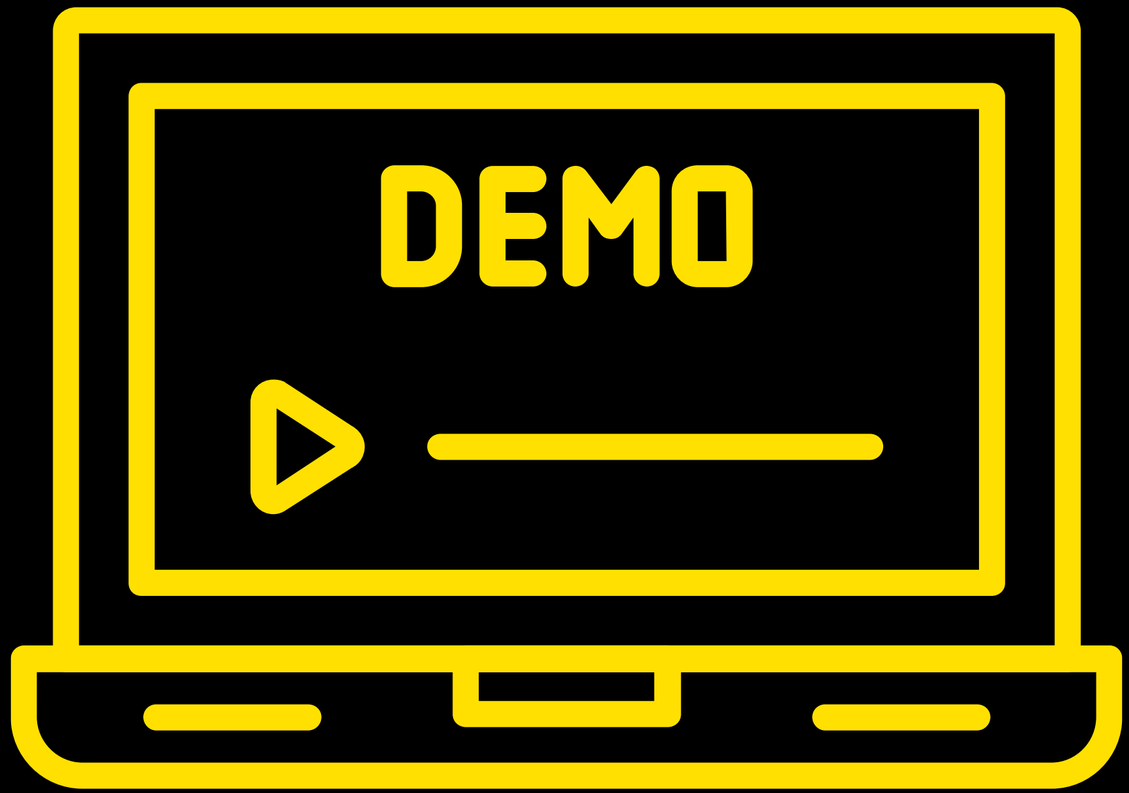
When the model makes predictions based on patterns it has learned

During **inference**, the model applies what it learned to new data without needing labels.

LIMITATIONS

Recognize patterns

Understand the world
like humans do


DEMO


```
reader = easyocr.Reader(['en'], gpu=True)
ocr_result = reader.readtext(image_name)
```

TOOL BOX

HuggingFace

Ollama

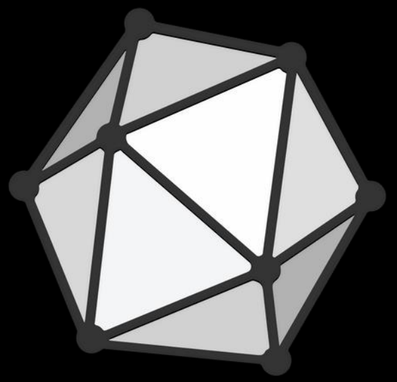
OpenAI

Azure

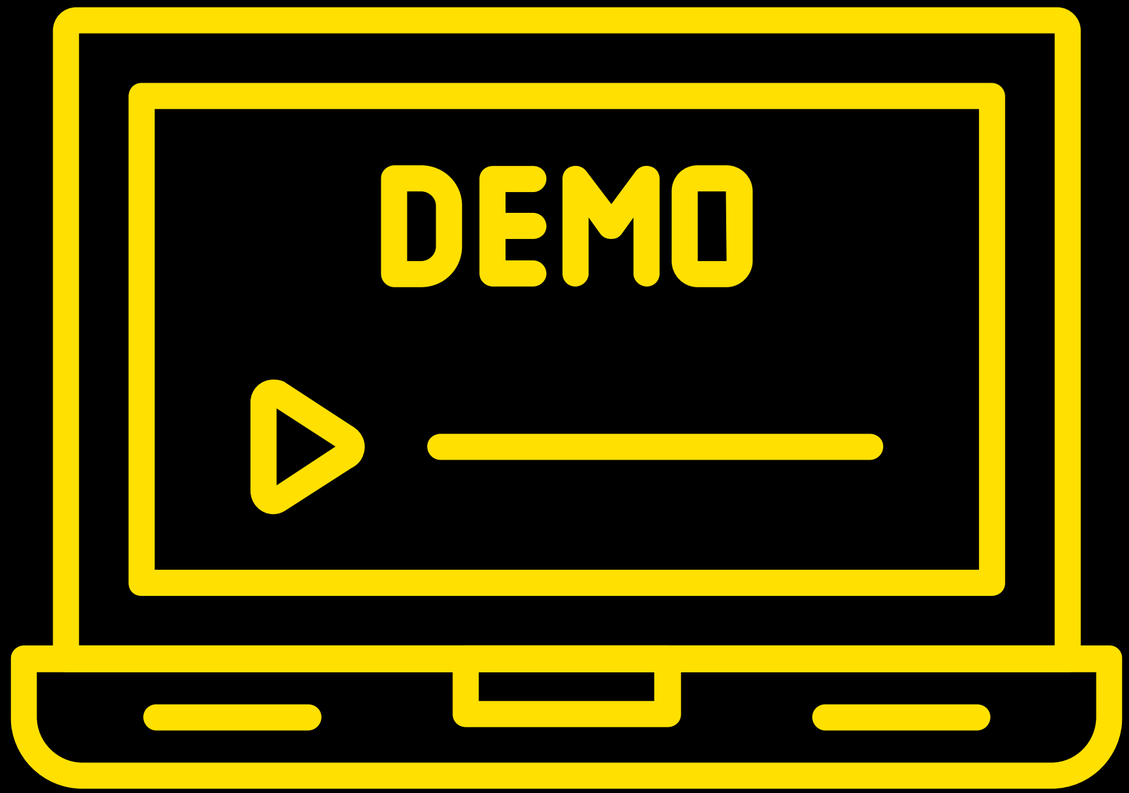
PyTorch

TensorFlow

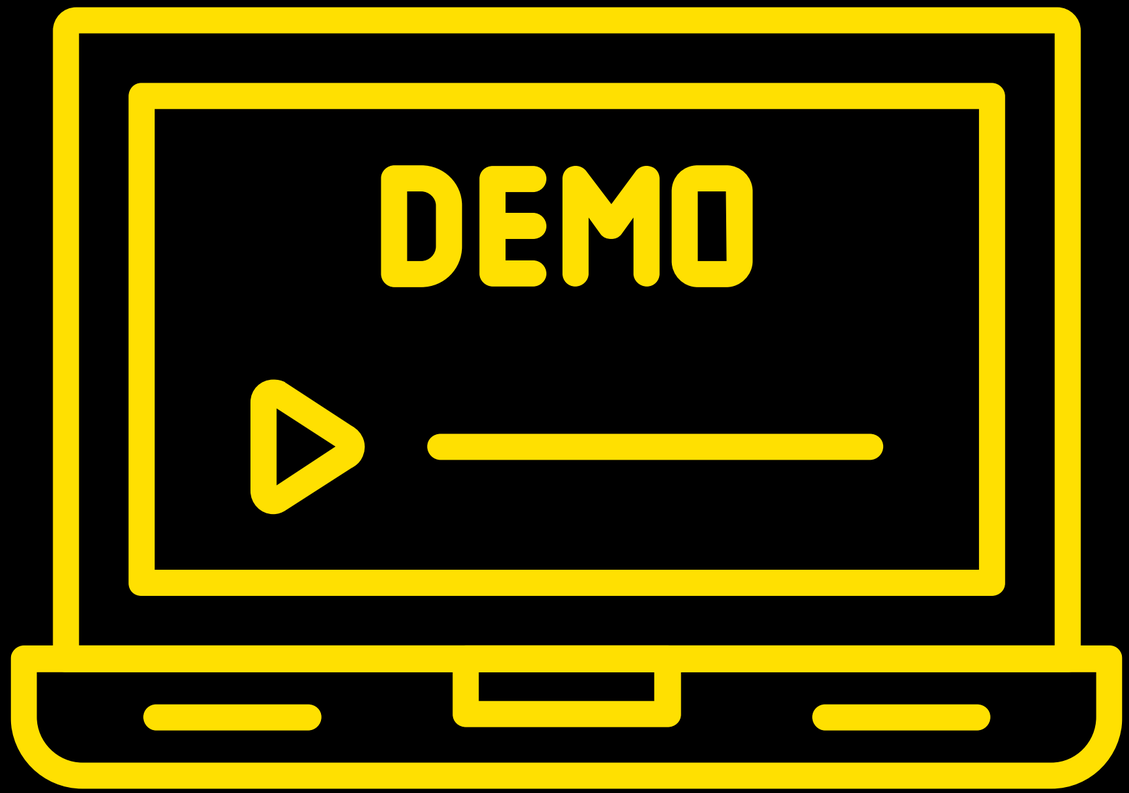
AWS



ONNX

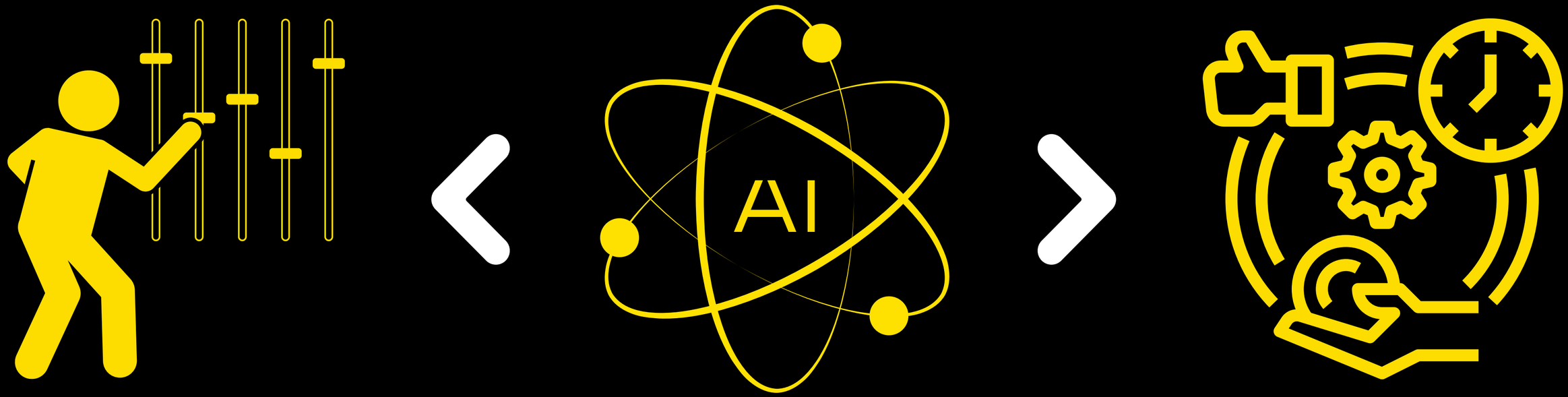

DEMO


```
speech_timestamps = get_speech_timestamps(audio, vad_model,
sampling_rate=sr)

for idx, segment in enumerate(speech_timestamps):
  start = segment['start']
  end = segment['end']
  segment_audio = audio[start:end]

  options = {
   'language': 'en',
   'verbose': False
   }

  transcription = model.transcribe(segment_audio, **options)
```


DEMO


```
# Generate embeddings for documents
corpus = [doc['title'] + ". " + doc['content'] for doc in documents]
document_embeddings = model.encode(corpus,
convert_to_numpy=True)
faiss.normalize_L2(document_embeddings)

# Build the FAISS index
dimension = document_embeddings.shape[1]
index = faiss.IndexFlatIP(dimension)
index.add(document_embeddings)


def semantic_search(query, top_k=3):
    query_embedding = model.encode([query],
                                   convert_to_numpy=True)
    faiss.normalize_L2(query_embedding)

    distances, indices = index.search(query_embedding, top_k)
```

FINE-TUNING & RAG



Fine-tuning the model

Augmenting the context

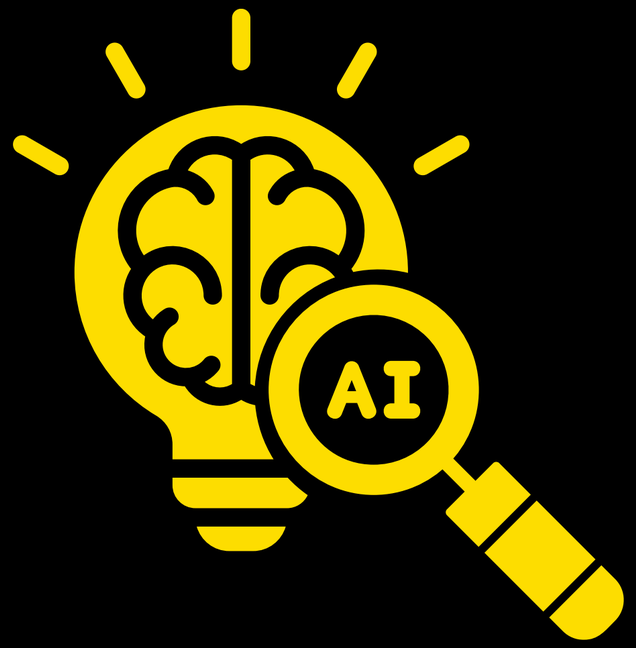
FINE-TUNING

Refines a general model with specialized data to improve performance in a specific domain

Transforms general models into experts by focusing on domain-specific data

Trains the model on specific data to fine-tune its parameters for your unique needs

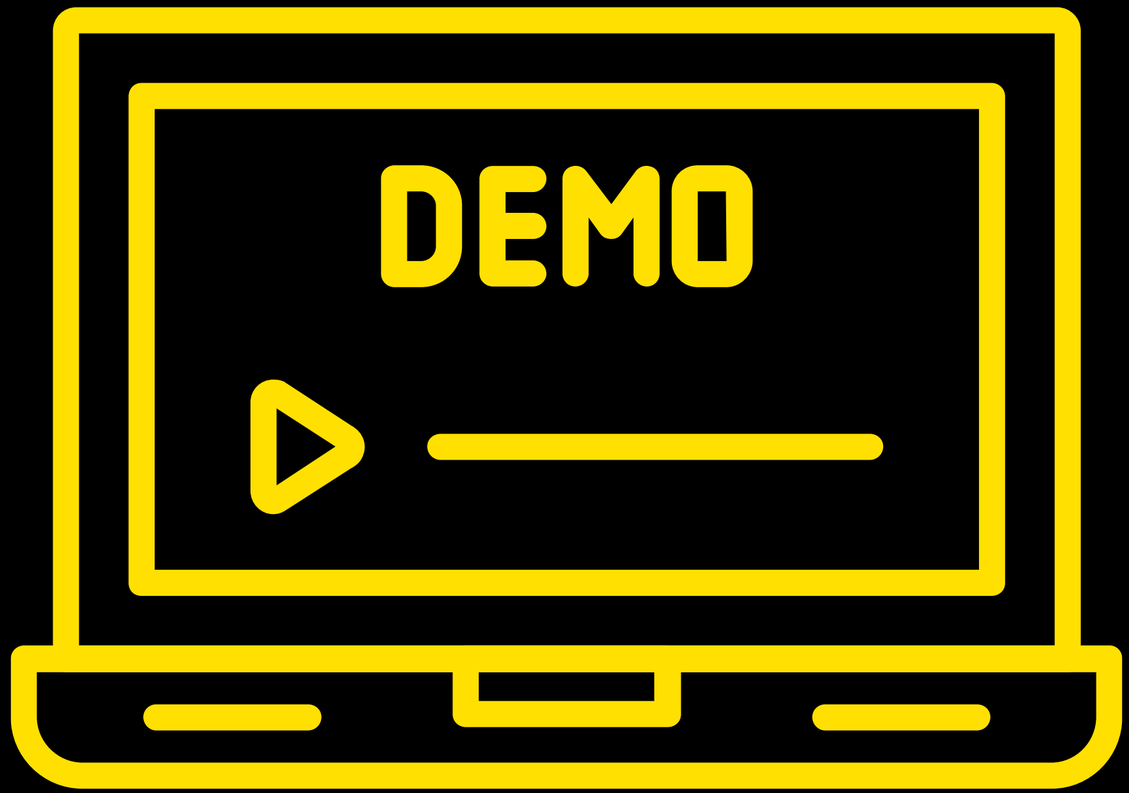
RAG



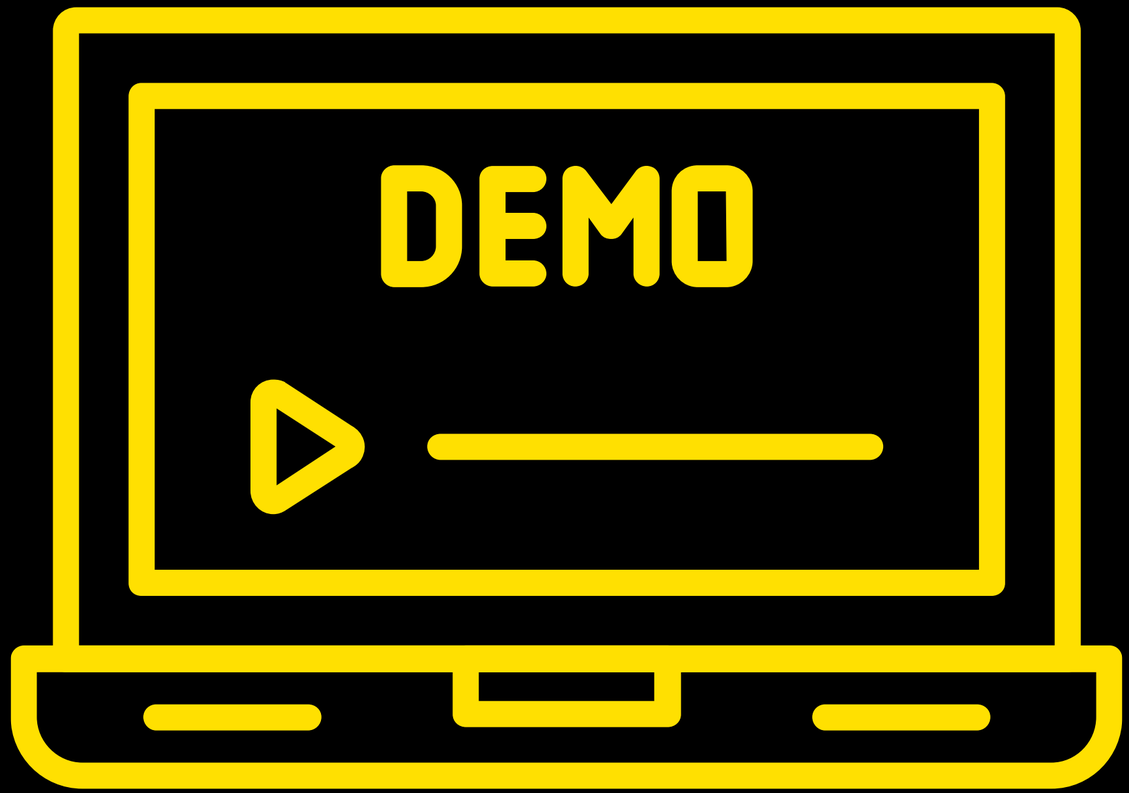
Combines the predictive power of AI models with real-time data retrieval

Retrieves data from external sources to generate contextually accurate responses

Ensures up-to-date and specific answers by accessing the most relevant information

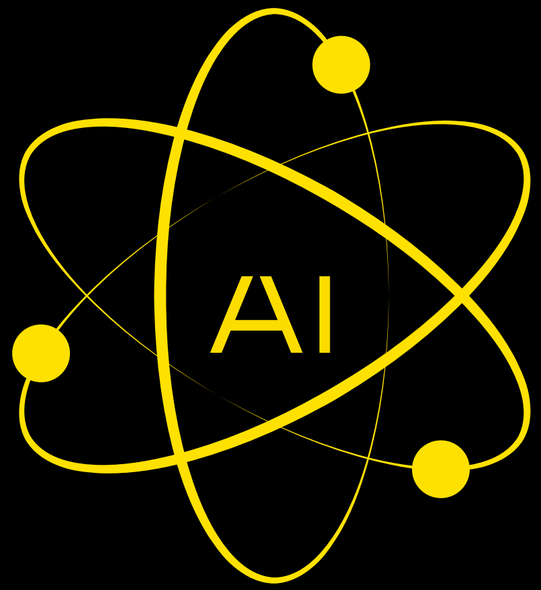

DEMO

```
combined_text = ' '.join(documents)

inputs = tokenizer(combined_text,
    max_length=1024, truncation=True,
    return_tensors='pt')

summary_ids = model.generate(inputs['input_ids'],
    num_beams=4, length_penalty=2.0,
    max_length=1024, min_length=40,
    no_repeat_ngram_size=3, early_stopping=True)

summary = tokenizer.decode(summary_ids[0],
skip_special_tokens=True)
```


DEMO

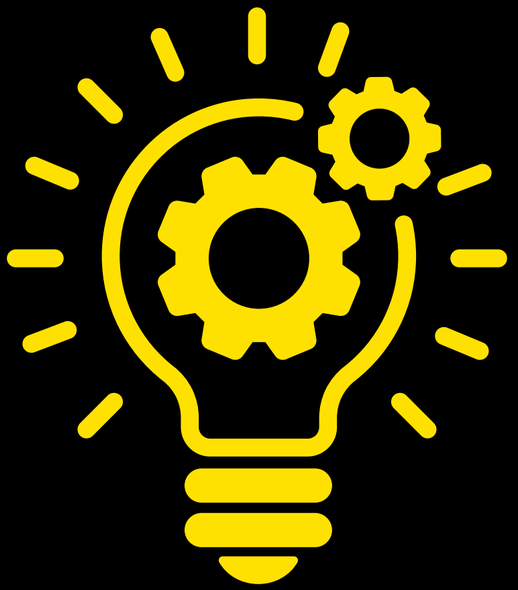
```
labels = ['action item', 'statement']

def extract_actionables(docs):
    actionables = []
    for doc in docs:
        result = classifier(doc, labels)
        if result['labels'][0] == 'action item':
            actionables.append(doc)
    return actionables
```

CONCLUSION



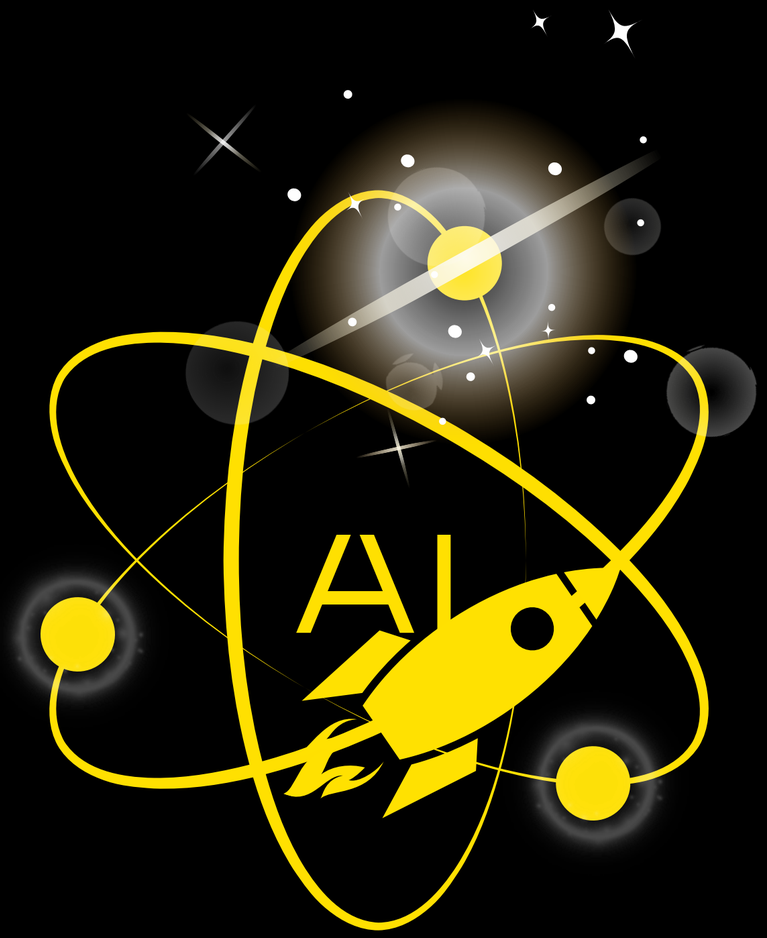
AI is transforming industries through tools like BeMyEyes, LiquidText, and DaVinci Resolve

AI platforms like HuggingFace and OpenAI offer ready-to-use models—no expertise needed



AI handles repetitive tasks so you can focus on innovation and big-picture thinking

AI IS THE FUTURE



Don’t wait

start exploring AI today to boost efficiency,

creativity, and step into the future of work.

GENAI IN ACTION

REAL-WORLD SOLUTIONS

SCAN ME

Thank you

https://bvnierop.nl

https://github.com/bvnierop

https://www.linkedin.com/in/bart-van-nierop/

Let's continue the conversation!