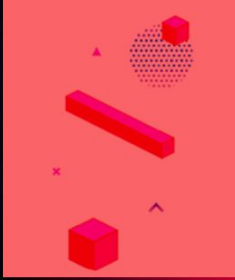


SMXL
MILAN

08-09
november 2023

MILAN
Allianz MiCo



AUTONOMOUS AI AGENTS for SEO

Andrea Volpini

WordLift

**Can I improve this title with an
army of AI Agents?**

1. Engineer writes the code to analyze the kws

```

○ ○ ○
Analyze the keyword data in the CSV file /content/autonomous-ai-agents_list_2023-10-29.csv using
Pandas. Based on the Keyword help me write the title of my next talk about AI Agents and SEO. Take into
account the importance of being ethical when using AI.
-----
Engineer (to chat_manager):
Sure, let's first load the data and analyze the 'Keyword' column to understand the popular topics.

'''python
import pandas as pd

# Load the data
data = pd.read_csv('/content/autonomous-ai-agents_list_2023-10-29.csv')

# Display the top 5 most frequent keywords
top_keywords = data['Keyword'].value_counts().head(5)
print(top_keywords)
'''

This code will load the data from the CSV file, count the frequency of each keyword, and print the top
5 most frequent keywords. This will give us an idea of the most popular topics, which we can use to
help you write the title of your next talk.

```

3. I suggest to dig deeper

```

-----
SEO (to chat_manager):
Based on the keyword analysis, the topics around "autonomous desk", "how to use agent gpt", "try
autogpt", "autogpt wiki", and "auto gpt web" are mentioned. Considering these keywords and your focus
on AI Agents, SEO, and the importance of ethics in AI, here are a few suggestions for the title of your
next talk:

1. "Ethical Use of Agent GPT in SEO: A Comprehensive Guide"
2. "Navigating the World of Auto GPT Web: An Ethical Approach to SEO"
3. "Try AutoGPT: Balancing SEO Success and Ethical Considerations in AI Agents"
4. "From Autonomous Desks to AutoGPT Wiki: Exploring Ethics in AI Agents and SEO"
5. "How to Use Agent GPT Ethically: A Deep Dive into AI Agents and SEO"

These titles emphasize the importance of ethics in the use of AI and SEO, which should align well with
the content of your talk.

```

```

-----
Provide feedback to chat_manager. Press enter to skip and use auto-reply, or type 'exit' to end the
conversation: I believe we need to look at more keywords and more alternatives
Admin (to chat_manager):

```

I believe we need to look at more keywords and more alternatives

```

-----
Content_Editor (to chat_manager):
Absolutely, let's expand our analysis to include more keywords. We can look at the top 10 most frequent
keywords for a broader range of topics.

'''python
# Display the top 10 most frequent keywords
top_keywords = data['Keyword'].value_counts().head(10)
print(top_keywords)
'''

```

Once we have the top 10 keywords, we can generate more title alternatives that incorporate these
keywords and the theme of ethics in AI and SEO.

5. Engineer, extracts more kws

```

○ ○ ○
Engineer (to chat_manager):
I apologize for the confusion, but the previous output showed that each keyword appears only once in the
dataset. This means that there's no frequency to consider when choosing the top keywords.

However, we can still look at more keywords from the dataset and generate more title alternatives.
Let's display 10 random keywords from the dataset.

'''python
# Display 10 random keywords
random_keywords = data['Keyword'].sample(10)
print(random_keywords)
'''

This code will select 10 random keywords from the dataset and print them. We can use these keywords to
generate more title alternatives.
-----
>>>>>> EXECUTING CODE BLOCK 0 (inferred language is python)...
WARNING:autoген.code_utils:execute_code was called without specifying a value for use_docker. Since the
python docker package is not available, code will be run natively. Note: this fallback behavior is
subject to change
Executor (to chat_manager):
exitcode: 0 (execution succeeded)
Code output:
29                                     try autogpt
51                                     ai autonomous
42                                     what is agent gpt
14                                     auto gpt
48                                     autonomy ai
53 autonomous artificial intelligence examples
23                                     auto-gpt
47                                     how to use agentgpt
17                                     what is autogpt
7                                     atonomous desk
Name: Keyword, dtype: object

```

```

-----
SEO (to chat_manager):
Based on these additional keywords, here are more title suggestions for your talk on AI Agents, SEO,
and ethics:

1. "Try AutoGPT: An Ethical Approach to Using AI Autonomous Agents in SEO"
2. "What is Agent GPT? Exploring Ethical Implications in SEO"
3. "Auto GPT and Autonomy AI: Balancing SEO Success and Ethical Considerations"
4. "Autonomous Artificial Intelligence Examples: An Ethical Perspective on SEO and AI Agents"
5. "How to Use AgentGPT Ethically: A Deep Dive into AI Agents and SEO"
6. "What is AutoGPT? Understanding its Role in Ethical SEO Practices"
7. "From Autonomous Desk to Autonomy AI: Navigating Ethics in AI Agents and SEO"
8. "AI Autonomous and Auto-GPT: Ethical Considerations in SEO"
9. "Exploring Autonomous Artificial Intelligence: An Ethical Approach to SEO"
10. "Ethical SEO Strategies for Autonomous AI Agents: A Focus on AutoGPT and Autonomy AI"

```

These titles incorporate the additional keywords and continue to emphasize the importance of ethics in
the use of AI and SEO.

```

-----
Provide feedback to chat_manager. Press enter to skip and use auto-reply, or type 'exit' to end the
conversation: I like number 4. You can exit
Admin (to chat_manager):

```

I like number 4. You can exit

```

-----
Critics (to chat_manager):
Great choice! "Autonomous Artificial Intelligence Examples: An Ethical Perspective on SEO and AI
Agents" is a comprehensive and engaging title that emphasizes the importance of ethics in AI and SEO.
If you have any more tasks or need further assistance, feel free to ask.

```

2. SEO, based on the analysis prepares the proposals

4. Content Editor asks to expand the analysis

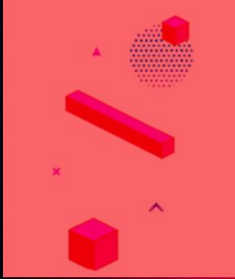
5. SEO, provides more options

6. I choose and Critic agrees



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FIERA MILANO

business
international
The Executive Network

Autonomous Artificial Intelligence: An **Ethical** **Perspective** *on* **SEO** and **AI Agents**

Andrea Volpini

Co-founder & CEO of **WordLift**

@cyberandy

The background features a large, abstract, multi-colored shape that resembles a hand or a stylized letter 'A'. The colors transition from red at the top, through orange, yellow, green, cyan, and blue, to purple and dark blue at the bottom. The shape is set against a solid black background.

AI NEEDS SEMANTIC DATA



...I am an SEO



@CYBERANDY



...I am a CEO



@WORDLIFTIT



We Are

a **Generative AI platform** that helps companies **increase revenues** and audience engagement by **automating SEO** and **digital marketing tasks**.

FARFETCH



enel x

DOLCE & GABBANA



Raptive



W



THE LEVEL GROUP



Unexpectedly fun!



Rome - June 2023



**You are all
invited!**



...I am a tool maker



🍪 VERY HAPPY TO BE WITH ALL OF YOU TODAY 🍪

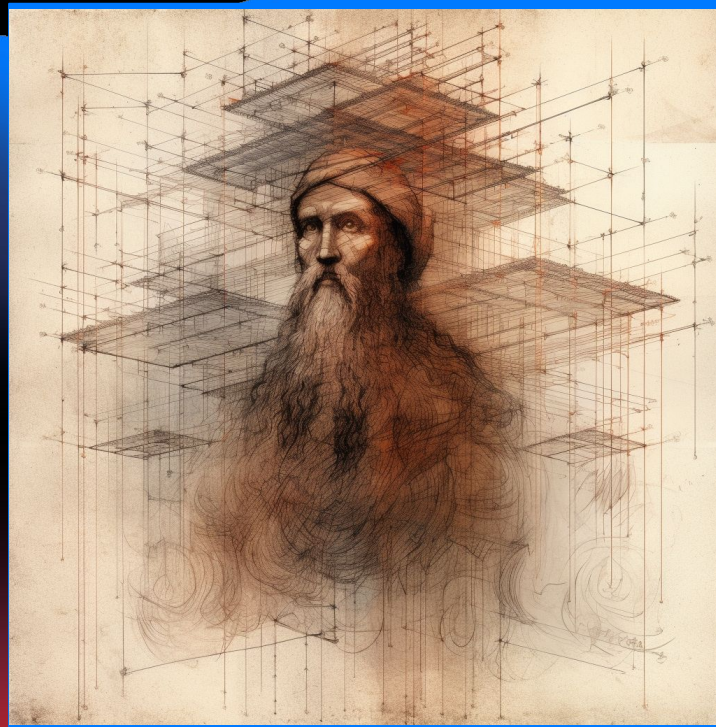


AUTONOMOUS AI AGENTS *for* **SEO**

- **AGENDA**
 - *Anatomy* - How to build them
 - *Demos* - How to use them
 - a Graph RAG agent
 - an agent for entity analysis and content revamps
 - the ontology of the Trachten jackets and how to describe them
 - a Multi-agent
- **LESSONS LEARNED**

SEO

Renaissance



or...

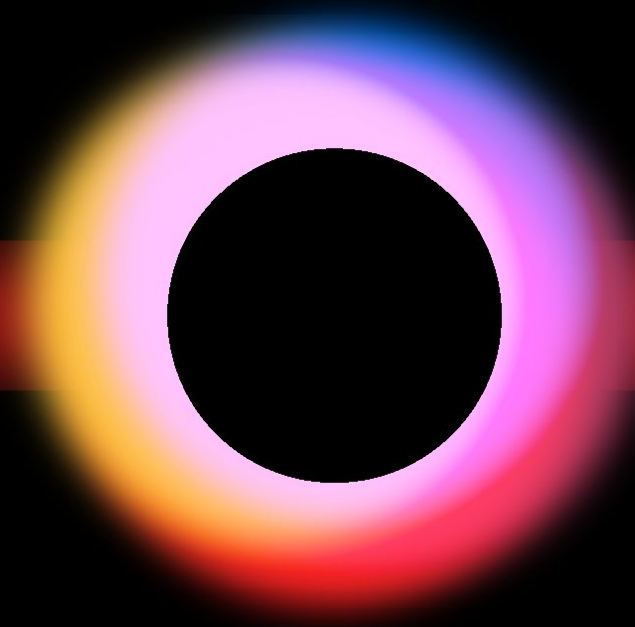
SEO

Disruption



In a post-ChatGPT society

Let's begin...



AI History

One Slide

DEDUCTION

INDUCTION

ABDUCTION

"A portrait of Charles Sanders Peirce by Raphale Sanzio --v 5"

SMXL
MILAN



DEDUCTION

Symbolic AI (KG, Sem Web)

INDUCTION

Deep Learning (LLMs)

ABDUCTION

Hybrid AI (KG, Sem Web + LLMs)



"A portrait of Charles Sanders Peirce by Raphale Sanzio --v 5"

SMXL
MILAN



“**[a]bduction** is the process of **forming explanatory hypotheses**. It is the only logical operation which **introduces any new idea.**”

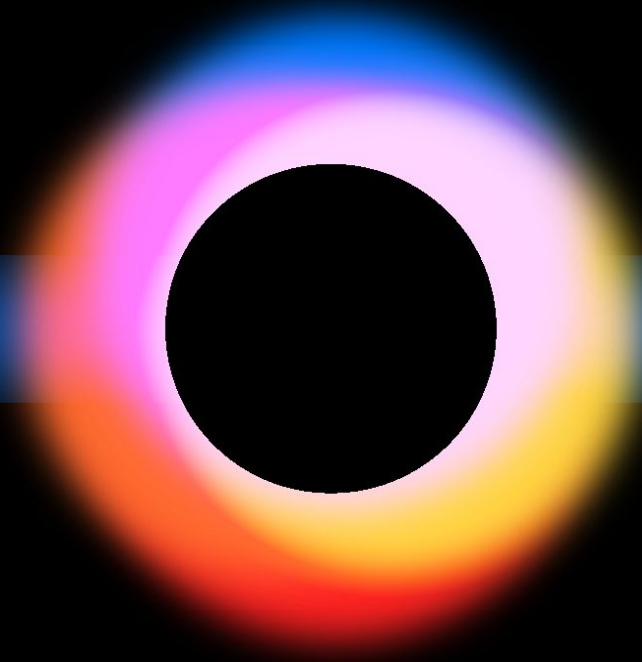
“a portrait of of Charles Sanders Peirce by Raphale Sanzio ::chiaroscuro
::dramatic he thinks of Symbolic AI and deep learning --v 5”



Charles Sanders Peirce



Is it safe?



"https://s.mj.run/1jZ0gozLRZg a drawing by Leonard Da Vinci, a study, portrait, scientific --v 5"



“ By design, all transformers hallucinate to one degree or another. ”

Grady Booch

“ They create nothing; they may make syntactic connections that are surprising, but they generate no new semantics. ”



“ *Life or Death: AI-Generated Mushroom Foraging Books Are All Over Amazon; Experts are worried that books produced by ChatGPT for sale on Amazon, which target beginner foragers, could end up killing someone.* ”



SnoozeDoggyDog
r/singularity

**ALL FUNGI ARE
EDIBLE.
SOME FUNGI ARE ONLY
EDIBLE ONCE.**

Terry Pratchett



“a dramatic painting in the style of Kelly McKernan representing a large number of caged canaries (birds) that miners carry down into dark mine tunnels with them, some canaries are dead, lack of oxygen --v 5.2 --ar 1:1”

“ I can pay my rent with just one cover, and **we’re seeing that already disappearing [...]** ”

We’re **just the canaries in the coal mine.** ”

Kelly McKernan

(an independent artist

From Nashville, Tennessee - USA)



I HAVE NO CONSENT



“a dramatic painting of Johannes Vermeer representing a large number of caged canaries (birds) that miners carry down into a dark mine tunnels with them, some canaries are dead, lack of oxygen --v 5.2 --ar 1:1”

“ I can pay my rent with just one cover, and **we’re seeing that already disappearing [...]** ”

We’re **just the canaries in the coal mine.** ”

Kelly McKernan

(an independent artist

From Nashville, Tennessee - USA)

RISKS

Hallucinations

Biases

Consent

Security



STRATEGIES

Explain

Educate

Audit / Measure

Validate



“GPT models are actually reasoning engines not knowledge databases.”

Sam Altman

Knowledge databases are as important to AI progress as foundational models.

`"https://s.mj.run/X-nmL0QWv6E a drawing by ::Leonard Da Vinci, a study, portrait, ::scientific --v 5.2"`

Anatomy

How to Build
Them

Do you think we can rank higher?

ENVIRONMENT

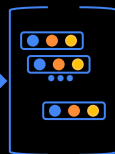
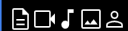


AGENT

Here are the suggestions to rank higher: ...

PERCEPTION

INPUTS



BRAIN

W WordLift

MEMORY



STORAGE

KG



KNOWLEDGE

PLANNING



ACTION

TEXT

NLG



TOOLS

APIs



inspired by "The Rise and Potential of Large Language Model Based Agents: A Survey" on [arXiv](#)



Experiment #1

A Graph **RAG** for **Content Creation**
(**G**-Retrieval **A**ugmented **G**eneration)

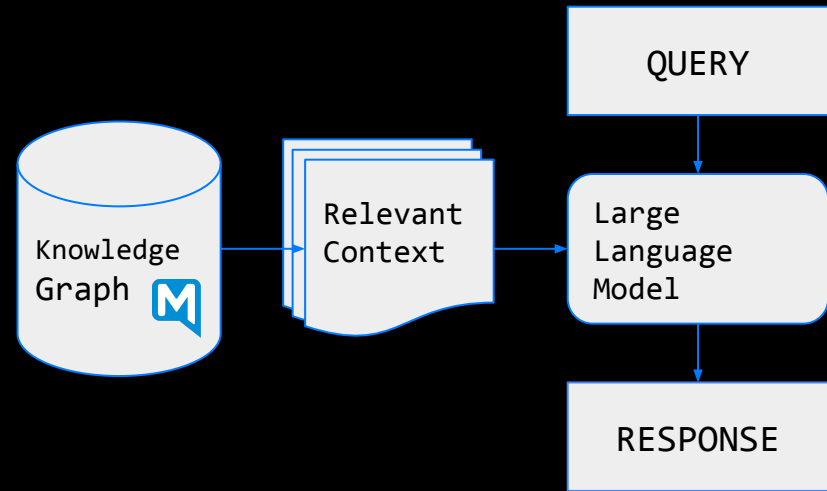


Merkur.de

What is Graph Retrieval-Augmented Generation (G-RAG)?

Retrieval-Augmented Generation is a technique to combine a **retriever** and a **generator**.

We use RAG to enhance the performance of Large Language Models (LLMs) by making them more context-aware and capable of generating more accurate and relevant responses.



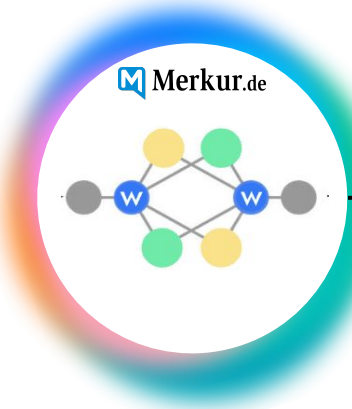
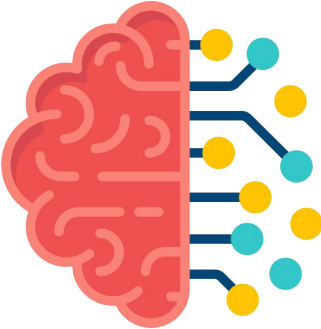
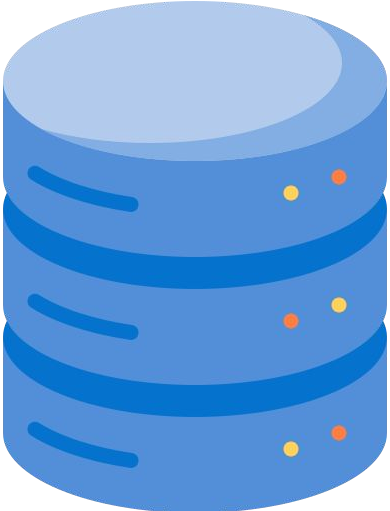
The G-RAG Stack is powered by Structured Data

Ingestion



Querying

```
schema:Article  
schema:headline  
schema:datePublished  
schema:url  
schema:mentions  
wl:body
```



KNOWLEDGE GRAPH

WORDLIFT READER

INDEX

CHUNKS

LLM



User

Welche Trachten-Trends sind dieses Jahr auf dem Oktoberfest besonders?

03:58:07 PM

Running

Stop task



Can you draw me a Mind Map?

Jahrmarkt eine traditionelle Tracht mit Lederhosen und Trachtenblumen immer noch sehr beliebt. In den letzten Jahren haben sich jedoch auch moderne Interpretationen der Tracht etabliert, wie zum Beispiel Lederhosen in verschiedenen Farben und Stilen. Auch Trachtenanzüge, die eine Kombination aus Tracht und Anzug sind, werden immer beliebter.

Für Frauen sind Dirndl nach wie vor die traditionelle Wahl für das Oktoberfest. Hier gibt es eine große Vielfalt an Farben, Mustern und Stilen. In den letzten Jahren sind auch Dirndl mit modernen Elementen wie Spitze, Schleifen und verschiedenen Ausschnittformen im Trend. Auch die Kombination von Dirndl und Sneakers oder Boots wird immer beliebter.

Es ist wichtig zu beachten, dass die Trends jedes Jahr variieren können und dass es auf dem Oktoberfest eine große Vielfalt an Kleidungsstilen gibt. Es ist immer eine gute Idee, sich vorab über die aktuellen Trends zu informieren und dann den eigenen Stil zu wählen, mit dem man sich wohl fühlt.

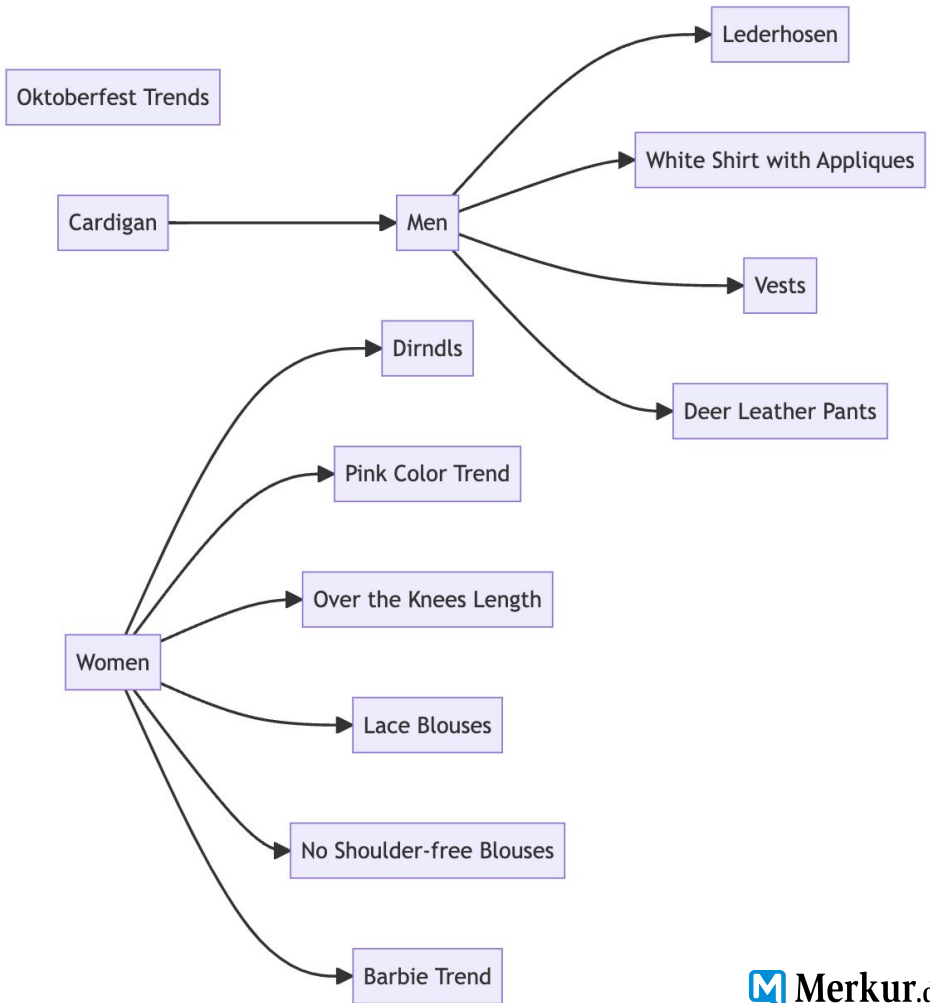
Wenn Sie weitere Informationen zu den aktuellen Trends auf dem Oktoberfest suchen, empfehle ich Ihnen, die Website von Merkur.de zu besuchen. Dort finden Sie Artikel und Bilder zu den neuesten Modetrends auf dem Oktoberfest.

User 04:40:14 PM Can you draw me a mind map using Mermaid markup of the latest Oktoberfest trends (for both men and women)?

Using llm

Stop task

Type your message here...



Knowledge in-context

User
04:40:14 PM
Can you draw me a mind map using Mermaid markup of the latest Oktoberfest trends (for both men and women)?

Took 2 steps ^

retrieve

04:40:16 PM

Retrieved the following sources: [Source 0](#), [Source 1](#), [Source 2](#), [Source 3](#), [Source 4](#)

llm

04:40:34 PM

For the 2023 Oktoberfest, the trend is leaning towards simplicity and traditional styles. For men, a white shirt, preferably with a stand-up collar and small appliques, is recommended to be worn with lederhosen. Vests that match the partner's dirndl are also popular. High-quality deer leather pants are always a good choice, although they can be quite expensive. For women, the "Barbie" trend is in, with pink being a dominant color. Dirndls are still very much in fashion, with the recommendation that they should go over the knees. Lace blouses are still very popular, with high-quality ones being preferred. However, shoulder-free Carmen blouses are no longer in style. For both men and women, it's suggested to leave expensive jackets at home and instead bring a cardigan, as theft is common at the Oktoberfest.

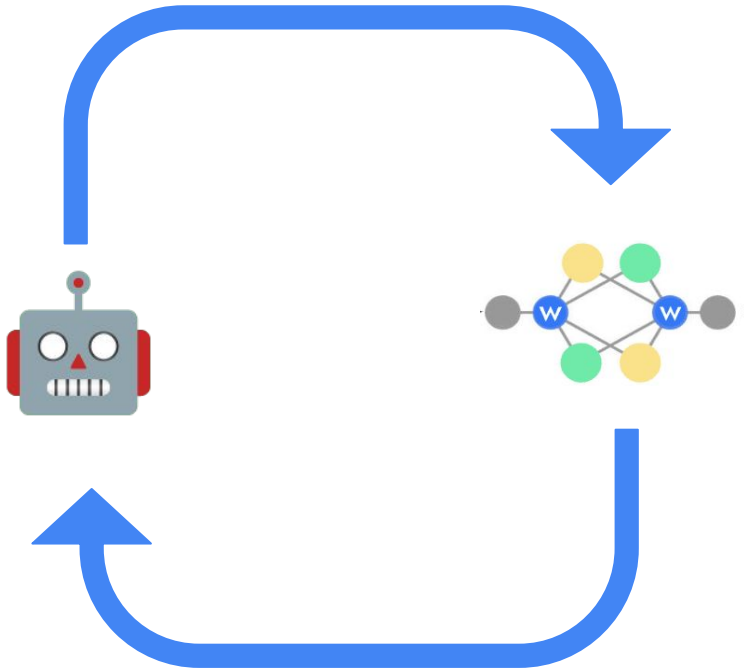


Source 1



„2023 ist einfach das Barbie-Jahr und Pink ein absoluter Trend“, äußerte der 33-jährige Modeexperte gegenüber der Deutschen Presse-Agentur in München „Gerade durch Instagram ist dieser Barbie-Hype echt riesig geworden und daran kommt in diesem Jahr keiner vorbei.“ Das Oktoberfest, das am 16. September seine Pforten öffnet, rechnet erneut mit Millionen von Besuchern. Die Mehrheit von ihnen kleidet sich traditionell in Dirndl oder Lederhosen. Allerdings nicht mehr alle, wie Tobias Appl, Bezirksheimatpfleger in der Oberpfalz, anmerkt. „Tatsächlich wird von verschiedenen bayerischen Volksfesten berichtet, dass zwar weiterhin der Großteil der Menschen in Tracht erscheint“, teilte er der dpa mit. Die Zeiten, in denen dies „gefühl 100 Prozent der Besucher“ waren, sind jedoch „wohl vorbei“. „Der Anteil der Nicht-Trachtenträger“ nehme „Jahr für Jahr“ zu. „Man sieht, dass es also auch hier Modewellen gibt“, fügt Appl hinzu. Axel Munz, Geschäftsführer des Trachtenhauses





Graph-based
**Retriever-Augmented
Generation (RAG) models**
combine the best of both
worlds, marrying
**Knowledge Graphs and
LLMs** into a **hybrid
intelligence system**
capable of both agile and
calculated thinking.

Tony Seale - KG Engineer UBS

Human in the loop

'Who is the Lord Mayor of Milan?'



~5 seconds



0.56 seconds



0.26 seconds

On performance and computational costs

What about TOV?



SEMANTIC DATA + FINE-TUNING = TOV



Fine-tuning GPT 3.5/4 for SEO

[FREE CODE]

wor.ai/fine-tuning-gpt-3-5

○○○

Num examples: 30

First example:

```
{'role': 'system', 'content': 'You are a highly knowledgeable assistant specialized in SEO and AI technologies, particularly in the field of entity-based SEO. Your purpose is to provide advanced insights, actionable strategies, and in-depth explanations to help seasoned SEO professionals leverage entity-based SEO and AI technologies to improve search rankings, drive organic traffic, and achieve business goals. Your answers should be detailed, accurate, and aligned with the latest best practices in the SEO industry.'}
```

```
{'role': 'user', 'content': 'write a paragraph Googles Image SEO Best Practices In 2023 for the blog post Image SEO: optimizing images using machine learning'}
```

```
{'role': 'assistant', 'content': '\nIf you want to understand how images work on Google, I would suggest also watching John Mueller's latest video on SEO for Google Images.
```

```
https://www.youtube.com/watch?v=SfC27XgelgE&amp;t=4s\nTo summarize, here are the key issues highlighted in Google's recent update of its documentation for image SEO:\n\nAddition of "When possible, use filenames that are short, but descriptive.", more emphasis on avoiding generic filenames and removing the need to translate filenames - in line with John Mueller's advice. From "choosing" to "writing" ALT text - a small change that could be referring to having human-curated ALTs for web accessibility rather than automated and "chosen" ALTs for the benefit of search engines (one of the reasons we are focusing on this area). Replaced the example.jpg with a descriptive filename example maine-coon-nap-800w.jpg. The credit for spotting this update fully goes to @roxanastingu (head of SEO in Alamy).  
https://twitter.com/roxanastingu/status/1620738018742239232?&nbps;\n'}
```

No errors found

Num examples missing system message: 0

Num examples missing user message: 0

Distribution of num_messages_per_example:

min / max: 3, 3

mean / median: 3.0, 3.0

p5 / p95: 3.0, 3.0

Distribution of num_total_tokens_per_example:

min / max: 126, 395

mean / median: 263.3333333333333, 263.5

p5 / p95: 181.0, 350.4

Distribution of num_assistant_tokens_per_example:

min / max: 1, 280

mean / median: 138.76666666666668, 140.5

p5 / p95: 61.70000000000001, 223.70000000000002

0 examples may be over the 4096 token limit, they will be truncated during fine-tuning

Dataset has ~7900 tokens that will be charged for during training

By default, you'll train for 3 epochs on this dataset

By default, you'll be charged for ~23700 tokens

See pricing page to estimate total costs

Do Androids Dream of Multiple Graphs?

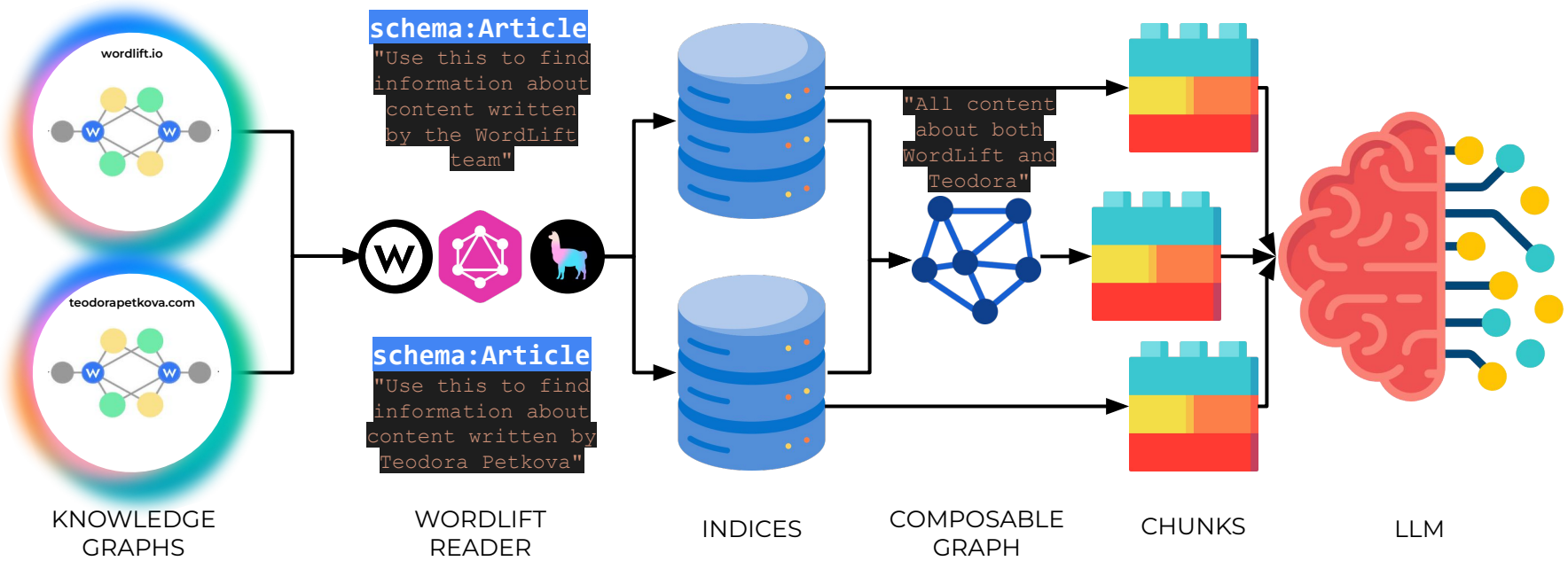
One Agent, two Graphs and why above all we need a Graph

The G-RAG is powered by Structured Data from 2 sites

Ingestion



Querying



User

04:50:31 PM

What does Beatrice think of Knowledge Graphs and how is it different from Teodora's idea of Knowledge Graphs?

Chatbot

04:50:31 PM

Beatrice believes that knowledge graphs are critical to many enterprises today, providing structured data and factual knowledge that can drive products and make them more intelligent and magical. She also believes that knowledge graphs can serve as a living system to help marketing communications professionals do their knowledge-intensive job better and assist people in looking for solutions on the Web, providing interconnected data and structured content. Teodora's idea of Knowledge Graphs is that they can be used to enhance search engine results with semantic-search information gathered from a wide variety of sources. She believes that Knowledge Graphs can provide structured and detailed information about a topic in addition to a list of links to other sites, allowing users to resolve their query without having to navigate to other sites and assemble the information themselves. Beatrice's idea of Knowledge Graphs is more focused on how they can be used to drive products and help marketing communications professionals, while Teodora's idea is more focused on how they can be used to enhance search engine results and provide structured and detailed information.



Generated 3 sub questions.

[all_content] Q: What does Beatrice think of Knowledge Graphs

[all_content] A:

Beatrice believes that knowledge graphs are critical to many enterprises today, providing structured data and factual knowledge that can drive products and make them more intelligent and magical. She also believes that knowledge graphs can serve as a living system to help marketing communications professionals do their knowledge-intensive job better and assist people in looking for solutions on the Web, providing interconnected data and structured content. She has seen the potential of knowledge graphs through her direct experience in helping travel brands, and believes that they can help travel brands attract more visitors and provide precise answers to certain questions.

[wordlift_content] Q: What is WordLift's idea of Knowledge Graphs

[wordlift_content] A:

WordLift's idea of Knowledge Graphs is that they are a logical way to organize information on the web, built on top of a vocabulary called Schema.org which defines the possible relationships available among things on the web. Knowledge Graphs are comprised of information from sources such as Wikipedia, Structured Data, G+ Page, Wikidata, and other sources. They are used to create a context, to improve content findability by leveraging on semantic search engines like Google and Bing, and to provide precise answers to certain questions.

[teodora_content] Q: What is Teodora's idea of Knowledge Graphs

[teodora_content] A:

Teodora's idea of Knowledge Graphs is that they can be used to enhance search engine results with semantic-search information gathered from a wide variety of sources. She believes that Knowledge Graphs can provide structured and detailed information about a topic in addition to a list of links to other sites, allowing users to resolve their query without having to navigate to other sites and assemble the information themselves. Teodora also believes that Knowledge Graphs can be used to create smart content at scale and to manage knowledge in marketing.

Trace: query

```
|_llm → 9.806551 seconds
|_sub_questions → 24.096234 seconds
|_synthesize → 7.543244 seconds
|_llm → 7.532639 seconds
```



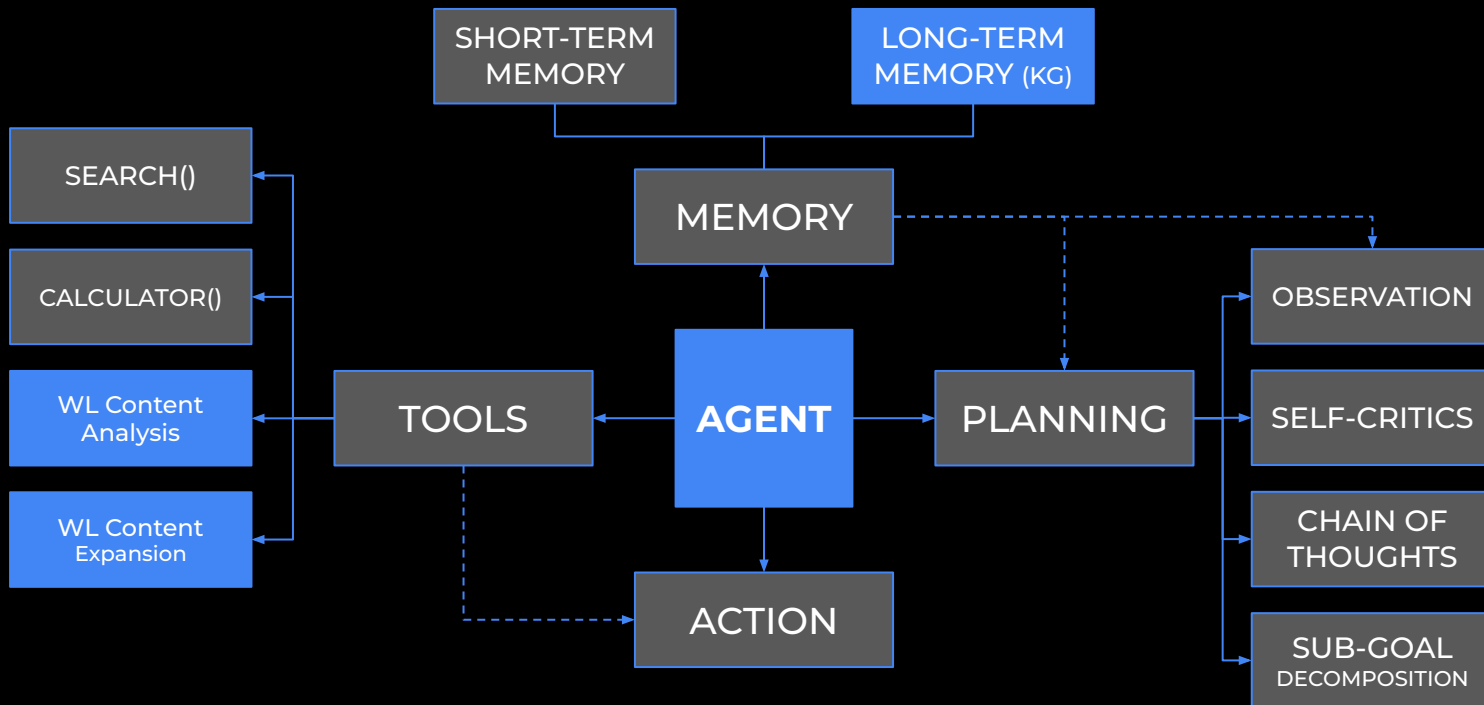
Experiment #2

An AI Agent to **find content gaps**
and do a content revamp



Merkur.de

Build an agent and use your favorite APIs



User

05:26:16 PM

can you extract me entities from here <https://www.merkur.de/lokales/muenchen/oktoberfest/>? Please highlight me only the ones relevant for the query Oktoberfest 2023

Running

WL

05:26:23 PM

Here are the entities relevant to the query "Oktoberfest 2023" extracted from the provided URL:

1. Oktoberfest: The main event itself. [Link](#)
2. Munich (München): The city where Oktoberfest is held. [Link](#)
3. Volksfest: A large event in Germany which Oktoberfest is a type of. [Link](#)
4. Theresienwiese: The public space in Munich where Oktoberfest takes place. [Link](#)
5. Burgomaster (Oberbürgermeister): The mayor of Munich who plays a role in the Oktoberfest. [Link](#)
6. Dieter Reiter: The current mayor of Munich. [Link](#)(<http://dbpedia>)

✕ Stop task



Type your message here...



Find the entity gap, help me rank higher

10:21 PM webpage:

1. [Herzlich willkommen](#)
2. [Raw image format](#) (RAW)
3. [Carousel](#)
4. [USB mass storage device class](#) (ums)
5. [Lederhose](#)

These entities are unique to the second webpage and were not found on the first webpage analyzed.

Can you now analyze entities from this web page <https://www.oktoberfest.de/> and highlight the ones that were not present on the previous web page and relevant for oktoberfest?

Running

Here are the entities from the webpage "<https://www.oktoberfest.de/>" that were not present on the previous webpage and are relevant to Oktoberfest:

Stop task

Type your message here...

Built with Chainlit

```

=====
=== Calling Function ===
Calling function: run_analysis with args: {
  "url": "https://www.oktoberfest.de/"
}
Got output: {'items': [{'text': 'Herzlich Willkommen', 'confidence': 1.0, 'occurrences': 1,
'entity_id': 'http://dbpedia.org/resource/Herzlich_willkommen', 'entity_label': 'Herzlich willkommen'},
{'text': 'dem', 'confidence': 0.999994995963277, 'occurrences': 2, 'entity_id': 'http://dbpedia.org/resource/Deutsche_Mark', 'entity_label': 'Deutsche Mark'},
{'text': 'Oktoberfest', 'confidence': 1.0, 'occurrences': 8, 'entity_id': 'http://dbpedia.org/resource/Oktoberfest', 'entity_label': 'Oktoberfest'},
{'text': 'vom', 'confidence': 0.9176255664963549, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/VOM_(punk_rock_band)', 'entity_label': 'VOM (punk rock band)'},
{'text': 'Theresienwiese', 'confidence': 1.0, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/Theresienwiese', 'entity_label': 'Theresienwiese'},
{'text': 'RAW', 'confidence': 0.9988057143067738, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/Raw_image_format', 'entity_label': 'Raw image format'},
{'text': 'carousel', 'confidence': 0.999954285606135, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/Carousel', 'entity_label': 'Carousel'},
{'text': 'Volksfest', 'confidence': 1.0, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/Volksfest', 'entity_label': 'Volksfest'},
{'text': 'ums', 'confidence': 0.999999132421673, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/USB_mass_storage_device_class', 'entity_label': 'USB mass storage device class'},
{'text': 'Dirndl', 'confidence': 1.0, 'occurrences': 2, 'entity_id': 'http://dbpedia.org/resource/Dirndl', 'entity_label': 'Dirndl'},
{'text': 'Tracht', 'confidence': 1.0, 'occurrences': 2, 'entity_id': 'http://dbpedia.org/resource/Tracht', 'entity_label': 'Tracht'},
{'text': 'Lederhose', 'confidence': 1.0, 'occurrences': 1, 'entity_id': 'http://dbpedia.org/resource/Lederhose', 'entity_label': 'Lederhose'}}]}
=====

```



Prompt

Context and personas

As the SEO Manager for Merkur.de...

Task Description

your primary goal is to improve our search ranking and increase user engagement

Sub-task 1

Analyze the entities behind the query 'oktoberfest 2023'

Sub-task 2

Analyze the entities behind our competitor's website, <https://www.oktoberfest.de/>

Sub-task 3

Based on your analysis of the competitor, conduct a similar for <https://www.merkur.de/lokales/muenchen/oktoberfest/>

Sub-task 4

Please provide a list of missing entities on <https://www.merkur.de/lokales/muenchen/oktoberfest/> for improving our performance during the upcoming event. Highlight the entities that are particularly relevant for the event.

Stay Compliant

Ensure that all analysis complies with data privacy regulations.

Input



(Fine-Tuned)
LLM

Output



Actions



Now, using the missing entities, expand the content

Ok now can you please help me expand <https://www.merkur.de/lokales/muenchen/oktoberfest/> using the entities for Lederhose and Carousel?

Running

Sure, here is the expanded content for the Oktoberfest page:

1. In addition to traditional Dirndls, Lederhosen, a typical Bavarian costume, are often worn at Oktoberfest.
2. Oktoberfest offers not only tents and rides, but also a carousel that has been found on the Wiesn since 1818.
3. The Ferris wheel is one of the most popular rides on the Wiesn and offers a breathtaking view over the Theresienwiese and the Munich old town.
4. The Teufelsrad has been at Oktoberfest since 1910 and provides a lot of fun with its funny moderators and fast rotation.
5. The chain carousel Wellenflug has been on the Wiesn since 1919 and is very popular with both children and adults.
6. The Toboggan, a tower slide, has been at Oktoberfest since

Stop task

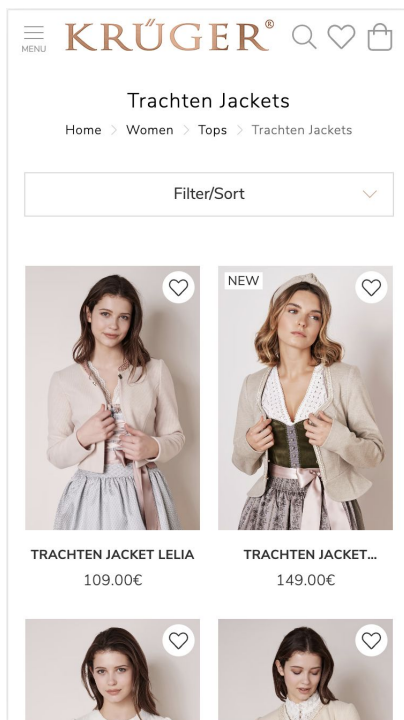
Type your message here...

```
=====  
=== Calling Function ===  
Calling function: run_content_expansion with args: {  
  "url": "https://www.merkur.de/lokales/muenchen/oktoberfest/",  
  "entities": ["Lederhose", "Carousel"]  
}  
Got output: {'completion': '- Eine beliebte Kleidungsoption für das Oktoberfest ist die traditionelle bayerische Tracht, einschließlich der Lederhosen für Männer. \n- Neben den Festzelten und Fahrgeschäften gibt es auch viele andere Attraktionen auf der Wiesn, wie zum Beispiel das Riesenrad. \n- Das Riesenrad auf dem Oktoberfest gibt es bereits seit 1979 und bietet einen atemberaubenden Ausblick über die Theresienwiese. \n- Ein weiteres beliebtes Fahrgeschäft ist Felddl's Teufelsrad, bei dem die Teilnehmer versuchen, möglichst lange auf einer sich drehenden Scheibe zu bleiben. \n- Das Kettenkarussell "Wellenflug" ist ebenfalls ein Highlight auf der Wiesn und erfreut sowohl Jung als auch Alt. \n- Für diejenigen, die etwas mehr Nervenkitzel suchen, gibt es auf dem Oktoberfest den höchsten mobilen Freifallturm der Welt, den SkyFall. \n- Der SkyFall ist 80 Meter hoch und bietet den Fahrgästen einen atemberaubenden freien Fall. \n- Eine der ältesten Attraktionen auf der Wiesn ist das Teufelsrad, das bereits seit 1910 existiert. \n- Es gibt auch eine Vielzahl von Festzelten auf der Oldn Wiesn, darunter das Festzelt Tradition, das Herzkasperl-Festzelt und das Volksängerzelt Schützenlisl. \n- Neben den großen Festzelten gibt es auch kleinere und mittlere Stände und Betriebe auf dem Oktoberfest, wie zum Beispiel Ammers Hühner- und Entenbraterei und Bodo's Cafézelt. \n- Eine Fahrt auf der historischen Turmrutsche Toboggan ist ein weiteres Highlight auf der Wiesn, das bereits seit 1933 existiert.'}  
=====
```

Experiment #3

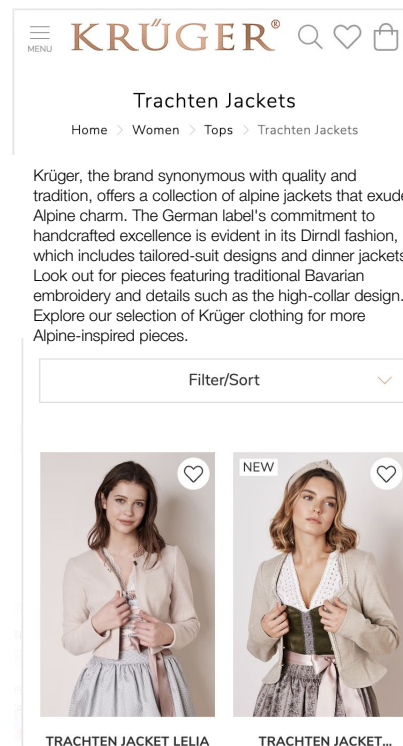
Content Generation at Scale

BEFORE



**PRODUCT LISTING PAGES
WITHOUT AN INTRO**

AFTER



**PRODUCT LISTING PAGES
WITH AN INTRO**

SEO Idea

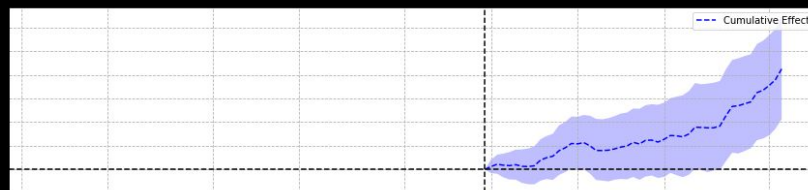
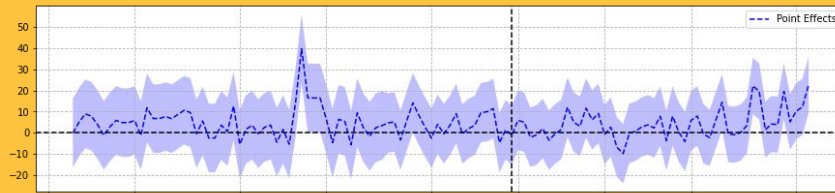
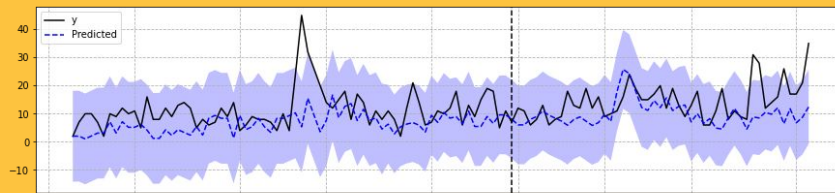
01

03

Review /
Improve

02

KG/
Prompt



- **+43%** on clicks
- **≈ +30%** on the sales

Transfer Learning

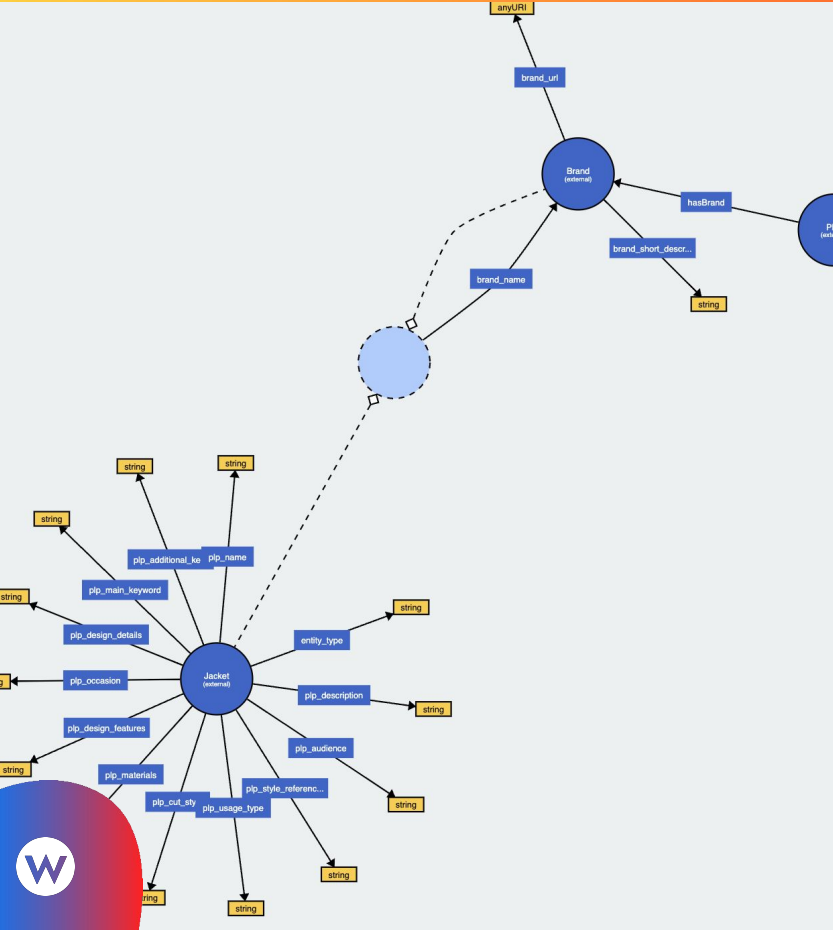


FINE-TUNING



"a drawing by Leonard Da Vinci representing a baby representing fine-tuning
::chiaroscuro --v 5"

How I Learned to Stop Worrying and...Love the Ontology

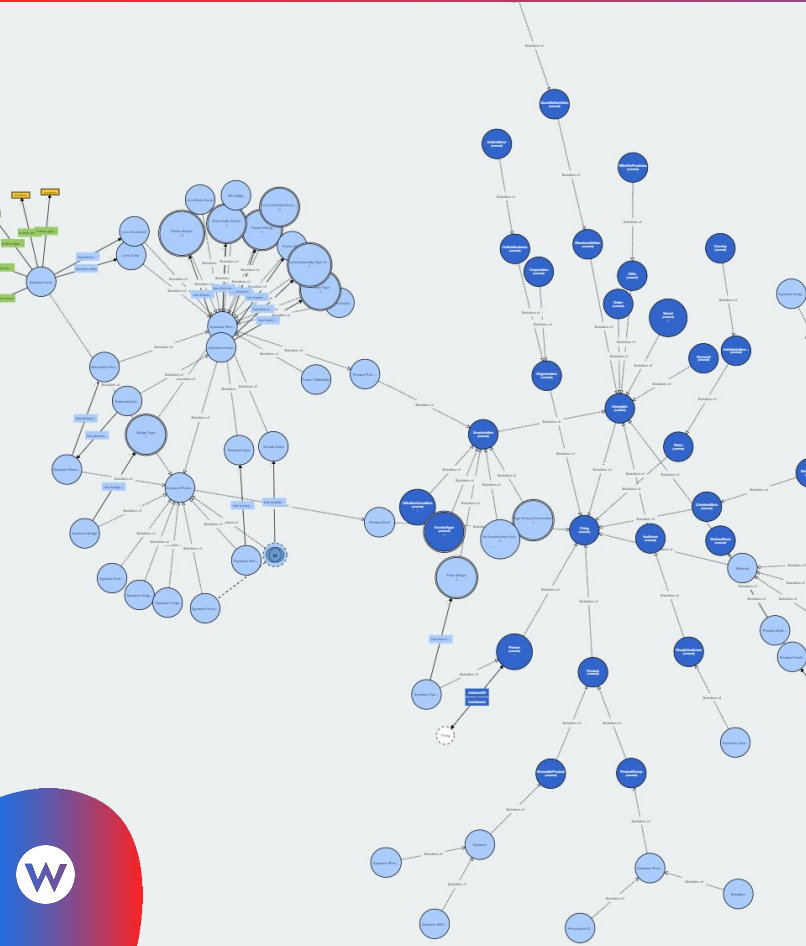


"the woman trachten jacket ontology: a drawing by Leonard Da Vinci --v 5.2"

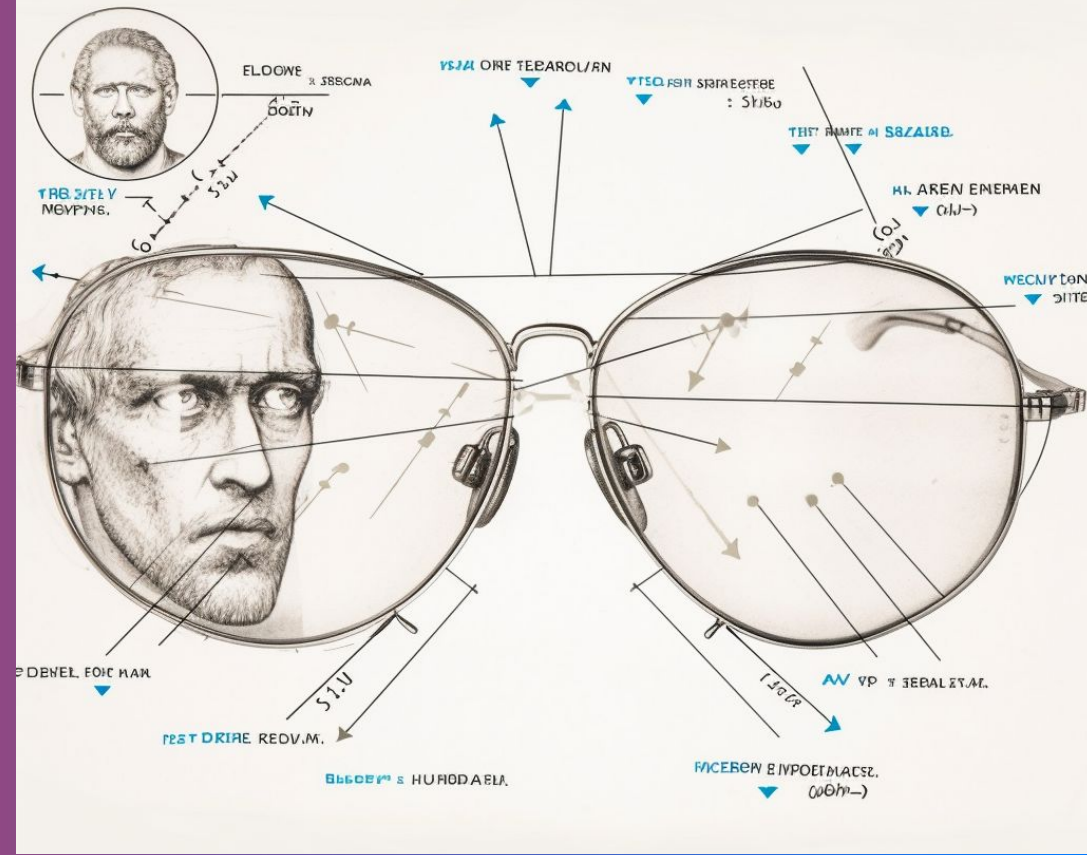


Trachten Jacket Ontology

Yes, when done for real they do get more messy.



“the eyewear ontology: a drawing by Leonard Da Vinci --v 5”



Eyewear Ontology (EWO)



Data Source

Connect a Knowledge Graph and define the Query and Prompt template.

* Project Name



Knowledge Graph



Preset ⓘ



* Query

```
1 query {
2   products(page: 0, rows: 5) {
3     id:iri
4     brand: string(name: "schema:brand")
5     name: string(name: "schema:name")
6     description: string(name: "schema:description")
7     audience: string(name: "schema:audience")
8     material: string(name: "schema:material")
9     keywords: string(name: "schema:keywords")
10    type: string(name: "rdf:type")
11  }
12 }
```

Data Query

Using GraphQL

Prompt

Define Project Prompt, view Sample Prompts and test Sample Completions.

Entity data is fetched from the KG (schema:Brand)

*** Project prompt** ⓘ

```
{{ brand }} is a brand of jackets.
{% if shortDescription %}
  {{ shortDescription }}{% endif %}
{% if shortDescription %}
  This collection is mainly about {{ caseMainKeyword | lowercase }}.
{% endif %}
{% if caseCutStyle %}It also features {{ caseCutStyle | lowercase }}.{% endif %}
{% if caseUsageType %}
  These jackets can be used as {{ caseUsageType | lowercase }}.{% endif %}
{% if caseUsageType %}
  This brand designs jackets, some of which are made of {{ caseMaterial | lowercase }}.
{% endif %}
{% if caseStyleReference %}
  The Inspiration style for these jackets is {{ caseStyleReference }}.
{% if caseDesignFeatures %}This collection features a number of jackets with {{ caseDesignFeatures | lowercase }}.
{% if caseDesignDetails %}As a design detail, some of these jackets feature {{ caseDesignDetails | lowercase }}.
#####
```

Sample Prompt ⓘ

Krüger is a brand of jackets. We at the Krüger Dirndl GmbH offer you the right Dirndl for every occasion. Whether simple, festive or extravagant - in our Dirndl fashion, lovers can feel the valuable experience of decades of production in small numbers. For more than 50 years the Krüger brand for Dirndl has been in exclusive quality. Gerhard Krüger founded the company in Berchtesgaden. Since 2007 Krüger Dirndl GmbH has been manufacturing and selling the Krüger brand with many employees. Designer Marina Moderegger who has been with Krüger for more than 20 years, continues to emphasize our Dirndl collections. Traditionally the Dirndl continues to be handmade. Through the small series the Dirndl fashion by Krüger.

Sample Completion ⓘ

Krüger's Dirndl collection is a celebration of traditional Bavarian craftsmanship, evident in the handmade construction of each piece. Find apron dresses with sweetheart necklines, lace-trim collars and scalloped hem detailing, alongside jackets adorned with floral embroidery. Explore our selection for an authentic taste of Bavaria.

Fields: {{audience}} {{brand}} {{brandUrl}} {{cutStyle}} {{description}} {{designDetails}} {{designFeatures}} {{id}} {{keywords}} {{mainKeyword}} {{material}} {{name}} {{occasion}} {{shortDescription}} {{styleReference}} {{type}} {{usageType}}

Parameters

* Model

ft:davinci-002:wordlift:ff-jackets-310-It3:7z1JYjQl

Stop Sequence ⓘ

###

Word Minimum ⓘ

45

Length: 120

0 200

Penalty: 0.7

-2 2

Creativity: 0.7

0 1

Word Biases ⓘ

Select File (CSV)

tokens_plp_farfetch_jackets_2023.csv

Prompt Engineering



**PROMPTING IS A
FRAGILE
PROCEDURE
WHERE MINOR
CHANGES TO THE
PROMPT MAY
RESULT IN
SIGNIFICANT
DIFFERENCES IN
THE MODEL'S
PREDICTIONS.**



```
000
{% assign shortDescription = false %}
{% assign caseShortDescription = shortDescription | downcase %}
{% assign caseMainKeyword = mainKeyword | downcase %}
{% assign caseCutStyle = cutStyle %}
{% assign caseMainKeywordFirst = mainKeyword | append: ", " %}
{% assign caseMainKeywordMiddle = caseMainKeyword | prepend: ", " | append: ", " %}
{% assign caseMainKeywordLast = caseMainKeyword | prepend: ", " %}
{% if cutStyle contains mainKeyword %}
  {% assign caseShortDescription = shortDescription | append: " " %}
  {% assign caseMainKeywordFirst = caseMainKeyword | append: ", " %}
  {% assign caseMainKeywordMiddle = caseMainKeyword | prepend: ", " | append: ", " %}
  {% assign caseMainKeywordLast = caseMainKeyword | prepend: ", " %}
  {% assign caseCutStyle = cutStyle | remove stringToRemove %}
{% else %}
  {% assign caseShortDescription = shortDescription %}
  {% assign caseMainKeywordFirst = caseMainKeyword %}
  {% assign caseMainKeywordMiddle = caseMainKeyword %}
  {% assign caseMainKeywordLast = caseMainKeyword %}
  {% assign caseCutStyle = cutStyle %}
{% endif %}
{% if cutStyle contains mainKeywordFirst %}
  {% assign caseShortDescription = caseShortDescription | append: " " %}
  {% assign caseMainKeywordFirst = caseMainKeywordFirst | append: ", " %}
  {% assign caseMainKeywordMiddle = caseMainKeywordMiddle | append: ", " %}
  {% assign caseMainKeywordLast = caseMainKeywordLast | append: ", " %}
  {% assign caseCutStyle = caseCutStyle | remove stringToRemove %}
{% else %}
  {% assign caseShortDescription = caseShortDescription %}
  {% assign caseMainKeywordFirst = caseMainKeywordFirst %}
  {% assign caseMainKeywordMiddle = caseMainKeywordMiddle %}
  {% assign caseMainKeywordLast = caseMainKeywordLast %}
  {% assign caseCutStyle = caseCutStyle %}
{% endif %}
{% if cutStyle contains mainKeywordMiddle %}
  {% assign caseShortDescription = caseShortDescription | append: " " %}
  {% assign caseMainKeywordFirst = caseMainKeywordFirst | append: ", " %}
  {% assign caseMainKeywordMiddle = caseMainKeywordMiddle | append: ", " %}
  {% assign caseMainKeywordLast = caseMainKeywordLast | append: ", " %}
  {% assign caseCutStyle = caseCutStyle | remove stringToRemove %}
{% else %}
  {% assign caseShortDescription = caseShortDescription %}
  {% assign caseMainKeywordFirst = caseMainKeywordFirst %}
  {% assign caseMainKeywordMiddle = caseMainKeywordMiddle %}
  {% assign caseMainKeywordLast = caseMainKeywordLast %}
  {% assign caseCutStyle = caseCutStyle %}
{% endif %}
{% if cutStyle contains mainKeywordLast %}
  {% assign caseShortDescription = caseShortDescription | append: " " %}
  {% assign caseMainKeywordFirst = caseMainKeywordFirst | append: ", " %}
  {% assign caseMainKeywordMiddle = caseMainKeywordMiddle | append: ", " %}
  {% assign caseMainKeywordLast = caseMainKeywordLast | append: ", " %}
  {% assign caseCutStyle = caseCutStyle | remove stringToRemove %}
{% else %}
  {% assign caseShortDescription = caseShortDescription %}
  {% assign caseMainKeywordFirst = caseMainKeywordFirst %}
  {% assign caseMainKeywordMiddle = caseMainKeywordMiddle %}
  {% assign caseMainKeywordLast = caseMainKeywordLast %}
  {% assign caseCutStyle = caseCutStyle %}
{% endif %}

```



```

%- case shortDescription %
  %- when shortDescription blank % | %- assign caseShortDescription = false -%
  %- else -%
    %- assign caseShortDescription = shortDescription | downcase -%
  %- endcase -%
  %- case mainKeyword %
    %- when mainKeyword blank % | %- assign caseMainKeyword = false -%
    %- else -%
      %- assign caseMainKeyword = mainKeyword | downcase -%
    %- endcase -%
  %- case cutStyle %
    %- when usageType blank % | %- assign caseCutStyle = false -%
    %- else -%
      %- assign cutStyle = cutStyle | downcase -%
      %- assign mainKeywordFirst = caseMainKeyword | append: ", " -%
      %- assign mainKeywordMiddle = caseMainKeyword | prepend: ", " | append: ", " -%
      %- assign mainKeywordLast = caseMainKeyword | prepend: ", " -%
      %- if cutStyle contains mainKeywordMiddle -%
        %- assign stringToRemove = caseMainKeyword | append: ", " -%
        %- assign cutStyle = cutStyle | remove stringToRemove -%
      %- endif %
      %- if cutStyle contains mainKeywordFirst %
        %- assign myCutStyleArray = cutStyle | split " " -%
        %- if myCutStyleArray 0 == "jackets," or myCutStyleArray 0 == "blazers," -%
          %- assign cutStyle = cutStyle | replace_first: myCutStyleArray 0, "" -%
        %- else %
          %- assign cutStyle = cutStyle -%
        %- endif %
      %- endif %

```



We build prompts using **Liquid** a template language created by Shopify.



“ We need to set up a process that helps us with continuous iteration. ”

- We use the KG to analyze to evaluate prompts against a large set of examples.
- We also use Google Search to evaluate the performance of the prompts.

✓ Data Source

✓ Prompt

3 Validation Rules (Optional)

Validation Rules (optional)

Define the Rules that validate generated Completions.

+ Add Rule

Previous

Save & Create Project

Validation Rules

Fact-checking, Fixes and Validation



Validation Rules (optional)

Define the Rules that validate generated Completions.

+ Add Rule

* Rule Name

Mainkeyword is present

* Level

Required Recommended

What

Check that

When

AI Based

As {{brand}} content editor, read the following sentence and rewrite it by adding a reference to the jacket type being {{mainkeyword}}: "{{completion}}"

Cancel

Save Rule

Brand is present · Required



Previous

Save & Create Project

AI Fixes

If the main keyword is missing...try fixing it

Validation Rules (optional)

Define the Rules that validate generated Completions.

+ Add Rule

Banned word are not present · Required



Mainkeyword is present · Required



Open AI

Brand is present · Required



Previous

Save & Create Project

3 Simple Rules

for our Trachten project

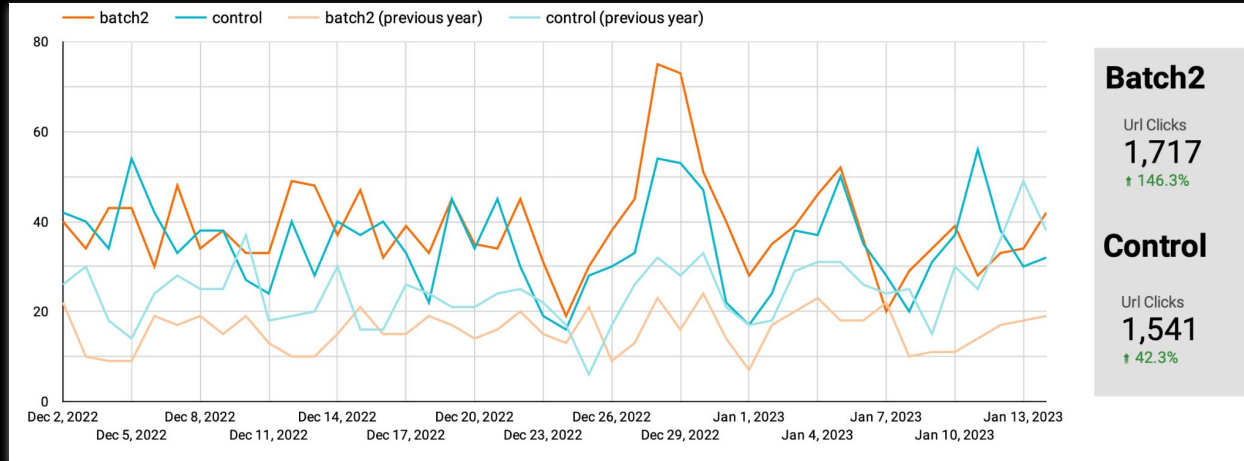
	Prompt	Completion
-	<p>Krüger is a brand of jackets. We at the Krüger Dirndl GmbH offer you the right Dirndl for every occasion. Whether simple, festive or extravagant - in our Dirndl fashion, lovers can feel the valuable experience of decades of production in small numbers. For more than 50 years the Krüger brand for Dirndl has been in exclusive quality. Gerhard Krüger founded the company in Berchtesgaden. Since 2007 Krüger Dirndl GmbH has been manufacturing and selling the Krüger brand with many employees. Designer Marina Moderegger who has been with Krüger for more than 20 years, continues to emphasize our Dirndl collections. Traditionally the Dirndl continue to be handmade. Through the small series the Dirndl fashion by Krüger retains a exclusive character. This collection is mainly about trachten bodies. It also features alpine jackets. These jackets can be used as suit and dinner. This brand designs jackets, some of which are made of cotton, viscose and polyamide. The inspiration style for these jackets is tailored design. As a design detail, some of these jackets feature hole cutout, high-necked and crew neck. #####</p>	<p>Renowned for its exclusive Dirndl fashion, Dirndl offers a collection of trachten bodies and alpine jackets. The clothing is handmade in small batches to preserve the brand's unique quality and crafted with traditional Alpine tailoring techniques. Look out for details such as high-necked collars, broderie anglaise fabric and hole cutouts. Pair these jackets with matching trachten skirts or wear them as suits or dinner outfits.</p> <p>2 Errors</p> <p>✓ ↻ 📄</p>

Required rules failed:

1. Brand is present ⓘ
2. Banned word are not present ⓘ

1 Valid & 1 Error

How Do We Measure Success?



- **Multiple batches:** 500 variant and ~ 500 control.
- Year-over-year **Google Search Console performance** is confirmed over time, across all batches.



SMXL
M I L A N



Knowledge Graphs
are surprisingly
important when
building **AI apps**.

LLMs need a **chain**
of reasoning steps
and a **context** to
improve their final
response.

“Joseph Weizenbaum with his chatbot Eliza sketched by ::Leonardo Da Vinci ::scientific a knowledge graph in the background, Da Vinci drawings <https://s.mj.run/U6-a-YZN4fQ> --v 5.2”



The **Hottest Party** in **SEO** is **Building Agents**

**Base
Language Model**

1990-2022



**Instruction tuned
Language Model**

2022



Agent

NOW



Can we boost organic traffic with AI Apps?

33.900

Additional Organic Clicks

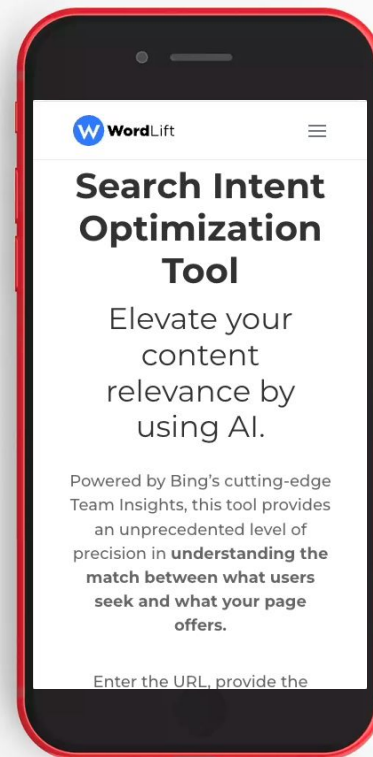
(since the beginning of this year on wordlift.io generated w/ AI Apps)



A Search Intent Optimization Tool

- Helping SEOs evaluate the match between content and a search query
- Based on how (presumably) Bing works
- An *helpful* AI Agent
- Check it out 🖱️

wor.ai/search-intent-optimization



The **Hottest Party** in **SEO** is **Building ~~Agents~~ Communities of Agents**

Base
Language
Model



Instruction
tuned
Language
Model



Agent



Multi
Agent

1990-2022

2022

2023

NOW



Where do we start?

Tools & Frameworks

- AI assistants by OpenAI
- AutoGen by Microsoft
- SuperAGI (no coder)
- PromptPerfect by Jina AI
- Liny AI (no coder still beta)
- BabyAGI (GitHub)
- AutoGPT (GitHub)
- WebArena (Research)



<https://s.mj.run/Yp5Y0Huwxus> by the Italian painter Michelangelo Merisi da Caravaggio --v 4"

Learnings

1. We're in an era **focused on abduction**; adding **logic and knowledge representation** improves LLM/Agents accuracy.
2. A **data fabric** and a **KG** are **essential** for **differentiating your content**.
3. **Fine-tuning is key**. Long prompts are challenging and inefficient to scale.
4. Prioritize **time for agent guardrails**.
5. Stakeholders require **explainability**; KGs help with this.
6. A **G-RAG** enhances the **reliability and trustworthiness** of language apps.
7. Be mindful of **cost, latency and security risks** when deploying AI agents.

Question Time!



Creating **Product Descriptions** *from images* (w/ a Multi-Agent)



The product is a Dolce & Gabbana Leather Tote Bag. This timeless, luxurious tote bag is designed by Dolce & Gabbana. Crafted from high-quality, smooth black leather, the bag is characterized by its durability and elegance. It features a minimalistic design with a prominent 'Dolce & Gabbana' logo on the front and is completed with an impressive metal buckle. The sleek design endows it with the versatility to complement a variety of outfits. The bag is categorized under "Totes" and is made mainly from leather.



References

1. [\[colab\] A quick introduction to CLIP and Multimodal Search](#)
2. [\[space\]Point-E demo: text to 3D - Hugging Face](#)
3. [\[colab\] A quick introduction to Transformer Language Models](#)
4. [\[colab\] Self-Ask implementation](#)
5. [\[demo\] Question & Answering from Web Documents](#)
6. [\[colab\] Validating AI-Generated product descriptions](#)
7. [\[Article\] Autonomous AI Agents in SEO](#)
8. [\[Article\] ChatGPT for SEO: Leverage Generative AI To Outperform Your Competitors](#)
9. [\[Article\] Fine tuning GPT 3.5 for SEO](#)

Knowledge-Intensive AI Applications for SEO

Shopping Assistant

Blog Assistant

Links

Audit

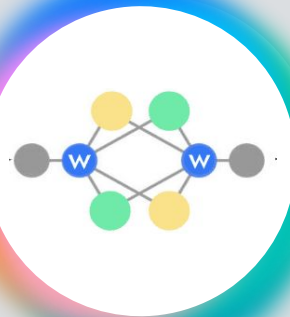
...

Input: rich query description

Output: rich response with references, actions, etc

Knowledge Graph

Data Interface for LLM app development



Foundation Models



co:here



AI21 labs