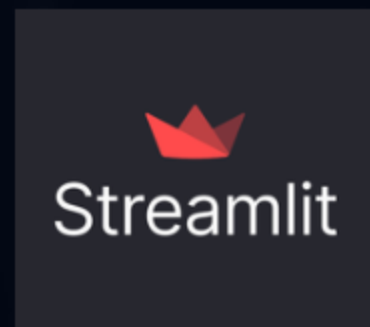


YouTube Content Search

RAFAEL COELHO

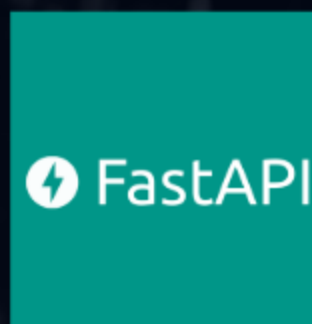
THIS PROJECT WAS BUILT
WITH THE FOLLOWING TOOLS:



STREAMLIT



PYTHON



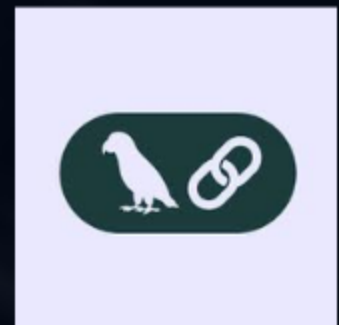
FASTAPI



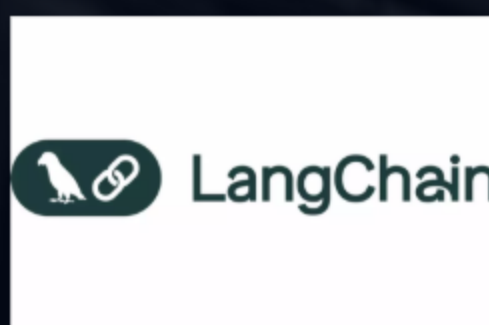
MLFLOW



MINIKUBE



LANGCHAIN



LANGGRAPH



NEO4J



DOCKER



KUBERNETES

THIS PROJECT WAS TESTED
WITH SOME OPEN SOURCE LLMS:



META
LLAMA 3.1,
3.2, 3.3



GOOGLE
GEMMA 2

YouTube Content Search

BY RAFAEL COELHO

YouTube Content Search allows you to
use the following LLM API services:



GROQ



SAMBANOVA



SCALEWAY



OPENAI

YouTube Content Search

Some available LLM models to use on
YouTube Content Search platform:



META LLAMA



**GOOGLE
GEMMA 2**



**MISTRAL
AI**



QWEN 2.5



DEEPSEEK R1



OPENAI

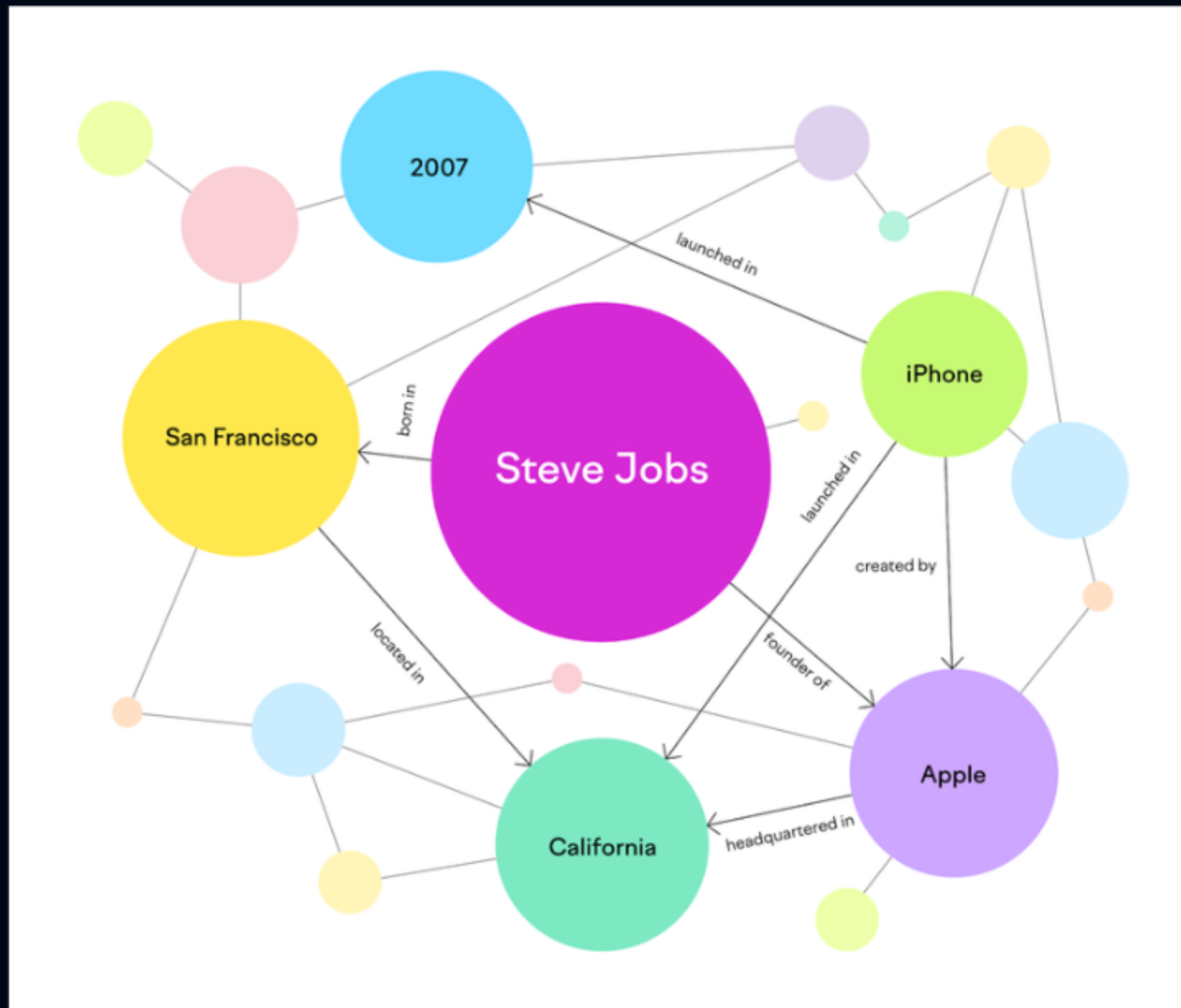


**GPT 4O
GPT 4O MINI
O1
O1 MINI
O3 MINI
O1 PREVIEW**

YouTube Content Search

BY RAFAEL COELHO

KNOWLEDGE GRAPHS



AI Agents

This platform leverages the power of AI Agents using LangChain and LangGraph to get important informations from YouTube videos, extract relationships between entities identified from video transcriptions and store these informations into a Graph Database called Neo4J.

Efficiency and accuracy

Knowledge Graphs enable more precise information retrieval than traditional RAGs with vector databases by explicitly modeling relationships between entities. Unlike vector-based RAG, which relies on semantic similarity, KGs structurally capture connections (e.g., 'X works_for Y → Y located_in Z'), allowing for accurate, multi-hop reasoning and logically consistent answers. This makes KGs superior for complex queries requiring relational understanding.

YouTube Content Search

BY RAFAEL COELHO

YouTube Content Search is a platform that connects the user to open source Large Language Models like **Llama 3.1** (Meta), **Gemma 2** (Google), and others through services like Groq and OpenAI. By using this platform, you can search for informations through 4 options:

1) Search

The **Search** option calls AI Agents to search for videos autonomously, based on the context and filters the user provides.

3) Channel

The **Channel** option calls AI Agents to retrieve informations from video transcriptions of a YouTube channel that the user has interest to know more about.

2) Video

The **Video** option extract the informations from a specific video requested by user.

4) Playlist

The **Playlist** option works in a similar way that **Channel** options does, but retrieving transcription informations coming from YouTube playlists instead.

And all these options allows the user to ask anything it wants about the videos transcriptions obtained and processed by AI Agents, and one of these AI Agents will answer accurately the questions by consulting and retrieving its own Knowledge Graph.

YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Deploy ⋮

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities
in world to become specialist
in Data Science and Machine
Learning?

Press Ctrl+Enter to submit form

Maximum videos to search

2

-

+

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search

A

First, the user can set 4 types: Search, Video, Channel and Playlist.

B

After, the user asks to AI Agent what it wants to AI Agents to search on YouTube

C

Additionally, the user can set the filters that will tune the AI Agents search on YouTube videos

D

Then, the user clicks here to start the AI processing on YouTube videos (search and transcription)

E

Finally, the user can ask anything about the videos transcriptions extracted by AI Agents

Your message



YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Deploy ⋮

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

- +

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search



User request

What are the best universities in world to become specialist in Data Science and Machine Learning?



Youtube search query

- best universities for data science and machine learning



Youtube videos searched



Graph nodes



Graph relationships



Graph source



Your message

1

Based on the context and filters the user provides, one of the AI Agents will generate a query to search videos on YouTube

YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Deploy

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search



User request

What are the best universities in world to become specialist in Data Science and Machine Learning?



Youtube search query



Youtube videos searched

	title	author	publish_date	views	length	captions	video_id
0	Top 10 Data Science Masters Programs in the USA for 2024 MS in USA 🇺🇸	Gradvine	2023-12-06T02:23:01-08:00	36264	7	['a.en']	l6QTo0eTjgQ
1	PHD in machine learning or data science, is it worth?	codebasics	2021-04-08T07:30:04-07:00	61901	158	['a.nl', 'en']	m684QWvWDTA
2	So You're Considering A Masters Of Data Science...	Greg Hogg	2021-07-31T07:00:12-07:00	18626	466	['a.en']	g5QgJc7yix8



Graph nodes



Graph relationships

Your message

2

After querying YouTube, the AI Agent will return the videos searched to be processed

YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Deploy ⋮

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

- +

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search



Graph nodes

id	type
Music	Genre
Pierce	Person
Beren	Entity
Korstje	Object
Ipad	Object
Journalist	Person
Sofie	Person
Lehigh	Organization
Rps	Event
Dhr	Title



Graph relationships



Graph source

Your message

3

Another AI Agent will get all videos transcriptions, process them and get their entities (graph nodes)

YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search

Deploy



Graph relationships

source_id	source_type	target_id	target_type	type
Pierce	Person	Beren	Entity	IS_IN
Pierce	Person	Korstje	Object	HAS
Pierce	Person	Ipad	Object	HAS
Pierce	Person	Journalist	Person	IS
Pierce	Person	Sofie	Person	IS
Pierce	Person	Lehigh	Organization	WORKS_AT
Pierce	Person	Rps	Event	ATTENDS
Pierce	Person	Dhr	Title	HAS
Pierce	Person	Barbie	Object	HAS
Pierce	Person	Computer Vision	Field	WORKS_IN



Graph source



Assistant response

The best universities in North America to become a specialist in Data Science and Machine Learning are:

- University of British Columbia

Your message



4

Also, this AI Agent will map the relationship (graph edges) between entities, based on the transcriptions

YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search

Deploy



Graph source

[Music] oh

is doen pierce die wordt in beren zijn dat deze korstje mijn ipad sometimes en on va journalist feedback hier zo dat ding is berm mijn inkomen is hoe specifieke lehigh rps weekend is dhr lessen pierce die in nl be barbie in computer vision zodra en disk en of job drive you we they pay hoe jullie hi oké sofie houdt dan ps in specifiek veel liever dan zijn breezer project euro of nodig in der domain de compliment hi hoe voor die specifiek role you will get paid like crazy bart dat ding is you how to studio desserts je je financieel mes loadmaster de mango doen plus die zo modieus you money money save your situation is er that you can break toegang aan de manier in and if you can for your education kost jullie soort poeder kwast of je hart deed pijn over um den 13 jullie doen bios die is wordt wat die families het rif minister die en uw handboek staat om iemand zo'n daarna moesten dus hoe doe je een beetje was in dsm en zorg computer science met dsp sjalotjes en en staat working beneden zijn deze de machine learning ingenieur steden weer mido stepway de you start earning money pluis post-doc industry na leed is een de fundex ps den bing stoornissen in codes zo you get more practical nodig voor view volle desembrood nu nog wel af de meest lieve start working dual stack money money for toeval sec een ding is je wil ook een ander practical experience voor whitby genie jim ik hem lekker export lijn door mijn ex plek voor wanneer je lessen nob oké je focus on there you get hanger die heb ik kampen in je weblog familie in de cette option to become blijft moeilijk het syndroom practical detail which i know where you can take all problems in the fun domain jullie houden zonder problemen worden you might know how in durft nooit of stamboom noemt

ouden zonder problemen worden you might know how in durft nooit of stamboom noemt in periferie ingezet perzik you might come a video en custom gerust ik zal boos moderne hebben een jungle medicijn story circuit in een churro oorlog practical guide over de vriend in zijn than sorry voor de lagg trouwens zo die zit er in als u nu toe concealer up before you make a decision of been psd in dsf hope you find this would you for you hij ook en ik kan mijn zoon question please post in de comment box billen

it's not necessarily worth the money and the time component spent on that [Music] one of the most common questions i get asked is do you need a masters in data science or analytics to get a job in data science machine learning in all of those fields well it's a bit of a tricky question to answer because there are so many different variables that come into play for if you in both a masters and phd and although you might h facebook apple amazon netflix google and the alike you can keep talking for a while and the reason for that is there's so many different jobs in the field and there's a huge caveat here there are particular jobs where you need a master's degree and some of them require remasters and there are jobs that do require a master's degree and some of them require a phd and sometimes even a phd to even as low as a minimum

5

And these are all videos transcriptions in chunks, that were processed in order to store entities and relationships into the graph database

Your message



YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search

Deploy



Graph nodes



Graph relationships



Graph source

6

Finally, another AI Agent answers the question made by the user, based on all videos transcriptions obtained.



Assistant response

The best universities in North America to become a specialist in Data Science and Machine Learning are:

1. University of British Columbia
2. McGill University
3. University of Waterloo
4. University of Toronto

In the USA, the top universities for Data Science and Machine Learning are:

1. Stanford
2. MIT
3. Caltech

These universities are highly regarded and can provide a strong foundation in Data Science and Machine Learning. However, it's worth noting that having a degree from one of these universities is not the only factor in becoming a specialist in the field. Practical experience, online courses, and certifications, such as those offered by Coursera, can also be valuable in demonstrating expertise.

Your message



YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Deploy

Settings

View application graphs

Clear memory

Search type

Search

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

Upload date

None

Duration

None

Features

Choose an option

Sort by

Upload Date

Set and search



Assistant response

The best universities in North America to become a specialist in Data Science and Machine Learning are:

1. University of British Columbia
2. McGill University
3. University of Waterloo
4. University of Toronto

In the USA, the top universities for Data Science

1. Stanford
2. MIT
3. Caltech

These universities are highly regarded and can provide a strong foundation in Data Science and Machine Learning. However, it's worth noting that having a degree from one of these universities is not the only factor in becoming a specialist in the field. Practical experience, online courses and certifications, such as those offered by Coursera, can also be valuable in demonstrating expertise.

7

After all these steps, the user can ask anything about the videos retrieved, and then another AI Agent will answer the questions based on the Knowledge Graph generated over the video transcriptions.



User request

What are all costs cited in the videos?



Assistant response

The costs cited in the videos are time and money, specifically referring to the time and financial investment required for a master's degree.

Your message



YouTube Content Search

BY RAFAEL COELHO

Author: Rafael Silva Coelho

Deploy 

Settings

View application graphs

Clear memory

Search type

Search 

Context to search

What are the best universities in world to become specialist in Data Science and Machine Learning?

Maximum videos to search

3

- +

Upload date

None 

Duration

None 

Features

Choose an option 

Sort by

Upload Date 

Set and search



User request



And what are all people and places cited in the videos?



Assistant response



The people and places cited in the videos are:

People:

- The speaker (no specific name mentioned)
- Professors (mentioned as a group, not specific individuals)
- People who have bypassed master's and PhD degrees (mentioned as a group, not specific individuals)

Places:

- University of British Columbia
- McGill University
- University of Waterloo
- University of Toronto
- Stanford
- MIT
- Caltech
- University of Waterloo

7

After all these steps, the user can ask anything about the videos retrieved, and then another AI Agent will answer the questions based on the Knowledge Graph generated over the video transcriptions.

Your message



YouTube Content Search

BY RAFAEL COELHO

YouTube Content Search

Author: Rafael Silva Coelho

Settings

View application graphs

Clear memory

8

By clicking on "View application graph" button, you can take a look at the AI Agents graph structure (LangGraph) and the processing flow that makes all these processes possible.

Video URL

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

Set and search

View Neo4j context graph



Assistant response

This video is all



User request

What are all co



Assistant response

ec

ui

.9

00

2500 to 35

- 25 to 2800

- 200 Euros

- 20 to 25 p

- 18 Euros fo

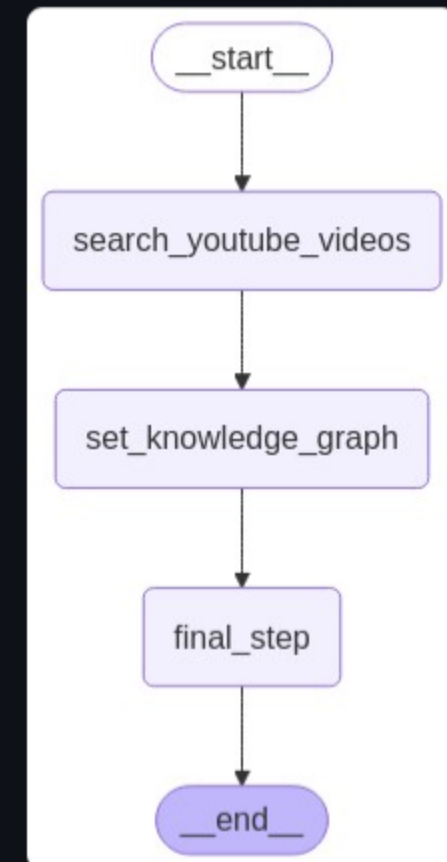
- 75 Euros for a meal for two at a mid-range restaurant

- 5 Euros for a beer

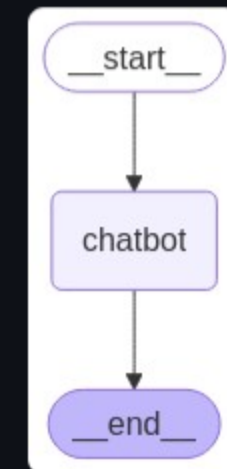
- 3 Euros for a coffee

Application graphs

YouTube Content Search



YouTube Chatbot



Deploy



es, and daily life.



Your message



YouTube Content Search

BY RAFAEL COELHO

YouTube Content Search

Settings

Videos

9

By clicking on “View Neo4J context graph” button, you can take a look at the Knowledge Graph generated over all the video transcriptions. This Knowledge Graph is stored on Neo4J, a graph database.

VIDEO ONE

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

Set and search

- 5 Euros to

- 3 Euros for

The costs cite

15,000 E

Context 1

look at

ated

s. This

Neo4J,

20 to 23 |

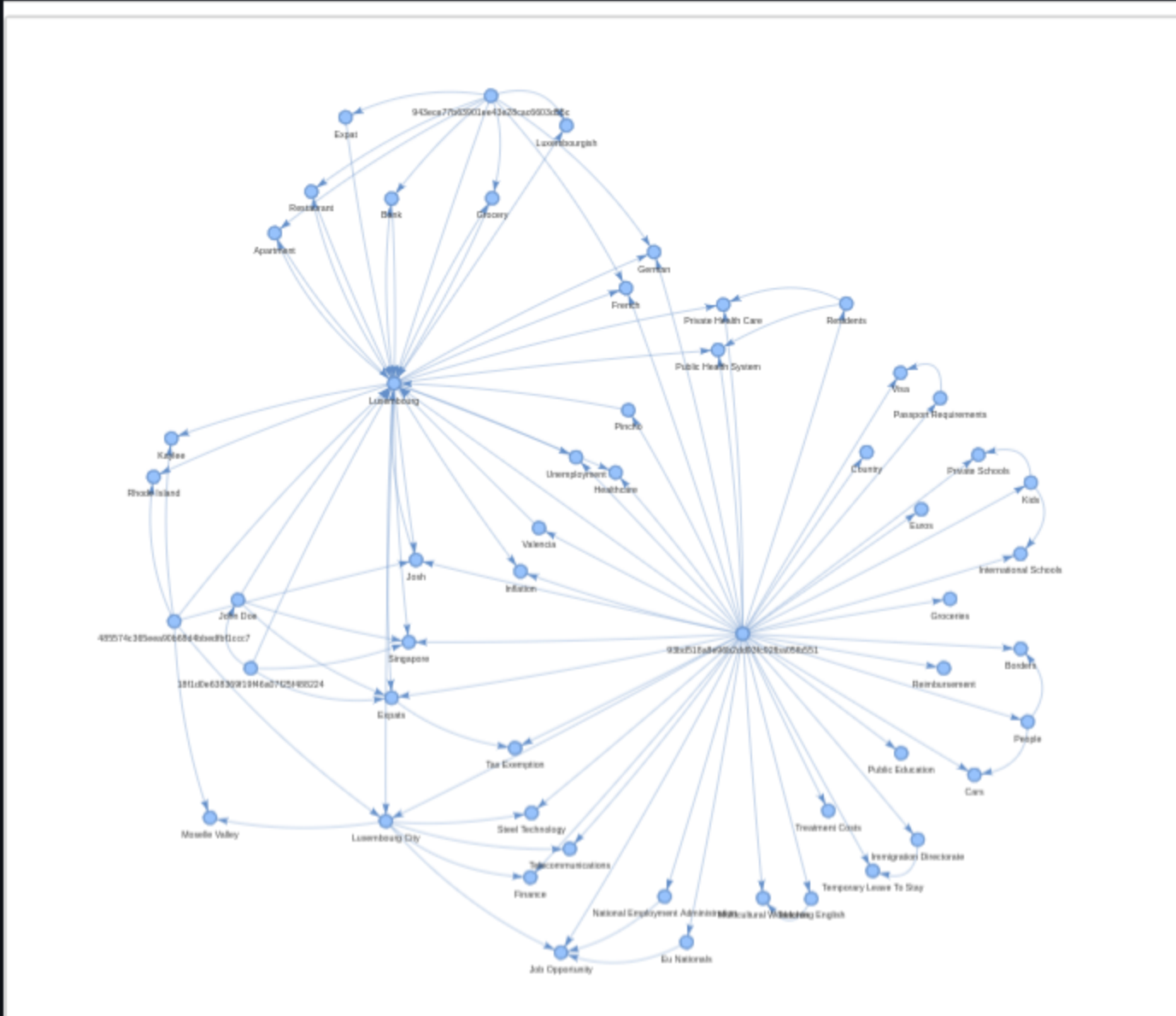
- 18 Euros

- 75 Euros

Neo4J Context Graph

✕

Interactive Neo4j Graph Visualization



FastAPI 0.1.0 OAS 3.1
[/openapi.json](#)

10

You can also check and test all FastAPI endpoints of this applications to inference, for example.

default

GET	/settings/frameworks	Get Framework	⌵
GET	/settings/frameworks/models	Get Framework Models	⌵
GET	/search_type	Get Search Type	⌵
GET	/search/upload_date	Get Search Upload Date	⌵
GET	/search/duration	Get Search Duration	⌵
GET	/search/features	Get Search Duration	⌵
GET	/search/sort_by	Get Search Duration	⌵
GET	/agents_config	Get Agents Config	⌵
PUT	/agents_config	Update Agents Config	⌵
GET	/model_config	Get Model Config	⌵
PUT	/model_config	Update Agents Config	⌵
GET	/youtube_content_search/clear_neo4j_graph	Clear Neo4J Graph	⌵
GET	/youtube_content_search	Set Model	⌵

YouTube Content Search

BY RAFAEL COELHO

Database Information

Use database

neo4j

Node labels

*(54)

City

Concept

Country

Currency

Document

Entity

Establishment

Geographical feature

Group

Industry

Institution

Language

Location

Person

Profession

Property

State

Store

Valley

Vehicle

__Entity__

Relationship types

*(105)

ATTEND

CAPITAL

CHOOSE

CROSS

EXPRESSED_INTEREST_IN

HAS

HAVE

ISSUE

LIVED_IN

LIVES_IN

LIVE_IN

LOCATED_IN

LOCATION

MENTIONS

OFFER

PAY_INTO

POPULATED_BY

PRIORITY

RECEIVE

REGULATE

REQUIRE

RESIDENT

SIMILAR_TO

SIZE_COMPARISON

SPEAKS

USE

WORKS_WITH

Property keys

neo4j\$

neo4j\$ MATCH (n) RETURN n LIMIT 25

Graph

Table

Text

Code

Overview

Node labels

*(25)

Document (3)

Country (1)

Entity (4)

__Entity__ (22)

State (1)

Person (3)

City (1)

Location (1)

Valley (1)

Language (3)

Property (1)

Institution (2)

Establishment (1)

Store (1)

Currency (1)

Concept (2)

Vehicle (1)

Geographical feature (1)

Relationship types

*(50)

MENTIONS (28)

CAPITAL (1)

SIZE_COMPARISON (1)

RESIDENT (2)

LOCATION (1)

LIVES_IN (1)

SPEAKS (3)

HAS (4)

LOCATED_IN (4)

USE (1)

CROSS (1)

\$:play start

neo4j

Try the preview!

Switch to the pre latest features.

11

The Neo4J interface is also available if the user wants to check the Knowledge Graph of the videos transcriptions, that is stored into the graph database.

Cypher basics

Intro to Graphs with Cypher

What is a graph database?

How can I query a graph?

YouTube Content Search

BY RAFAEL COELHO

Experiments

Search experiments

Default

YouTube Content Search

YouTube Content Search

Provide Feedback

Add Description

Share

Runs

Evaluation

Experimental

Traces

Search traces

Columns

	Request ID	Time created	Status	Request	Response	Run name	Execution time	Tags
	3f94ecce41da4bbf7fc516...	2 hours ago	OK	{ "question": "What are all costs cited in the video?" }	{ "names": ["costs", "video"] }		0.5s	
	d54a3a4d2d514e6da63a418...	2 hours ago	OK	{ "question": "What are all costs cited in the video?" }	> "The costs cited in the video include: \n\n- 15,000 Euros per year per kid for private international schools\n- 1600 to 1900 Euros for a one-bedroom apartment in the city center\n- 13 to 1600 Euros for a one-bedroom apartment outside the city cente...		1.6s	
	4d3d7e73569546989563395...	2 hours ago	OK	{ "question": "What is this video about?" }	{ "names": ["video"] }		3.7s	
	22637e00a6844d48b8be8a9...	2 hours ago	OK	{ "question": "What is this video about?" }	"This video is about living in Luxembourg as an expat, covering topics such as the country's culture, cost of living, job opportunities, and daily life."		32.2s	
	7ea0a97b19774fae943fe80d...	2 hours ago	OK	> { "input": " are a lot of similarities to another place that we lived which	> { "raw": { "content": "", "additional_kwargs": { "tool_calls": [{ "id":		20.6s	

< Previous

Next >

12

To check the AI Agents behavior, there is a MLflow interface available to trace all requests and responses flow.

Let's work together!



E-MAIL

coelhorafael@proton.me
rafaelcoelho1409@hotmail.com

