

Visual Search in E-commerce

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Visual Search
Recommendations

I like data powered products and machine learning

<https://github.com/bugra/visual-search-2018>

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Visual Search

Raison D'être

Fashion, home and furniture where visual appeal is very important to customer, we believe the image of the product they are looking for could provide a richer information building the search query more than words.

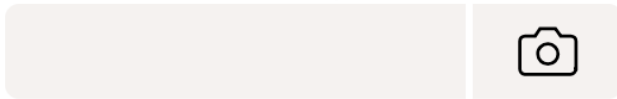






THE FALL OUTDOOR SALE

hayneedle     



limited time offers



THROUGH SEPTEMBER

THROUGH SEPTEMBER

THE FALL OUTDOOR SALE

hayneedle 



SHOP 

GALLERY

BLOG

Hayneedle > Visual Search

visual search

Shop in a snap! Find items (or similar ones) that caught your eye by uploading or taking a picture.

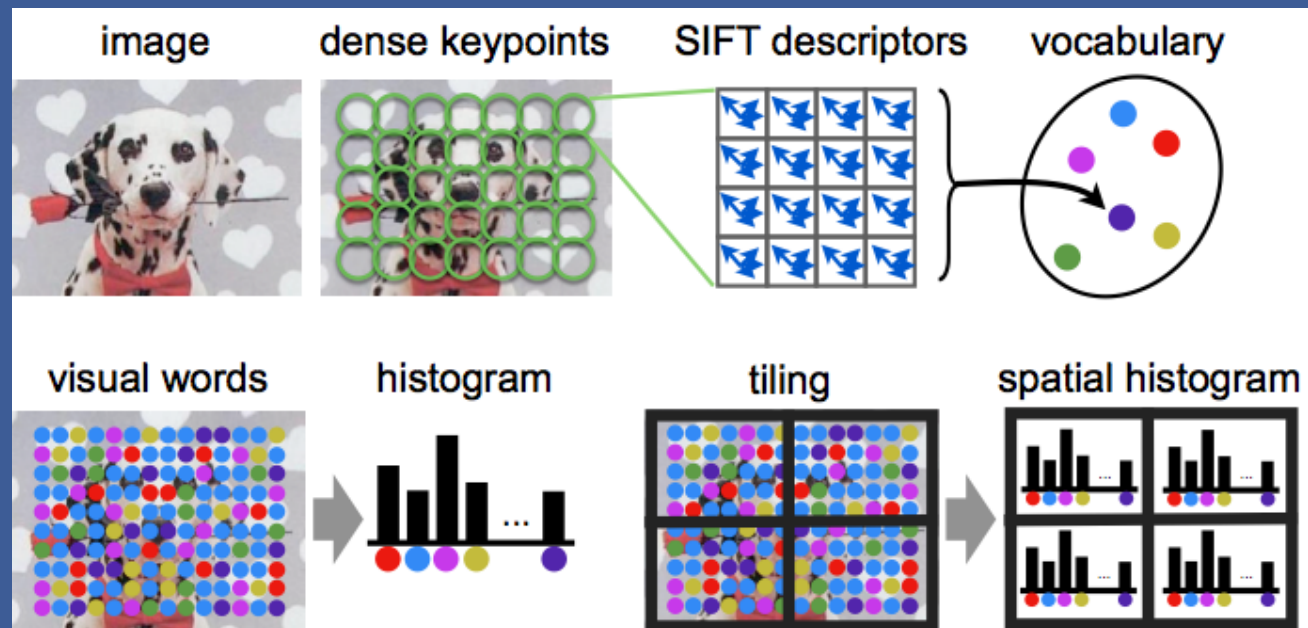
UPLOAD OR TAKE PHOTO

Raw Image?

Maybe not

Features

Engineered Features



Representation

What if

We **represent** the image into a feature vector

It's A Bird... It's A Plane... It's **Superman Embedding**

Embedding

A transformation of input data into a more useful representation — a list of real numbers, called a vector.

Indexing

Tensorflow
Embedding Generation on Product Images
FAISS

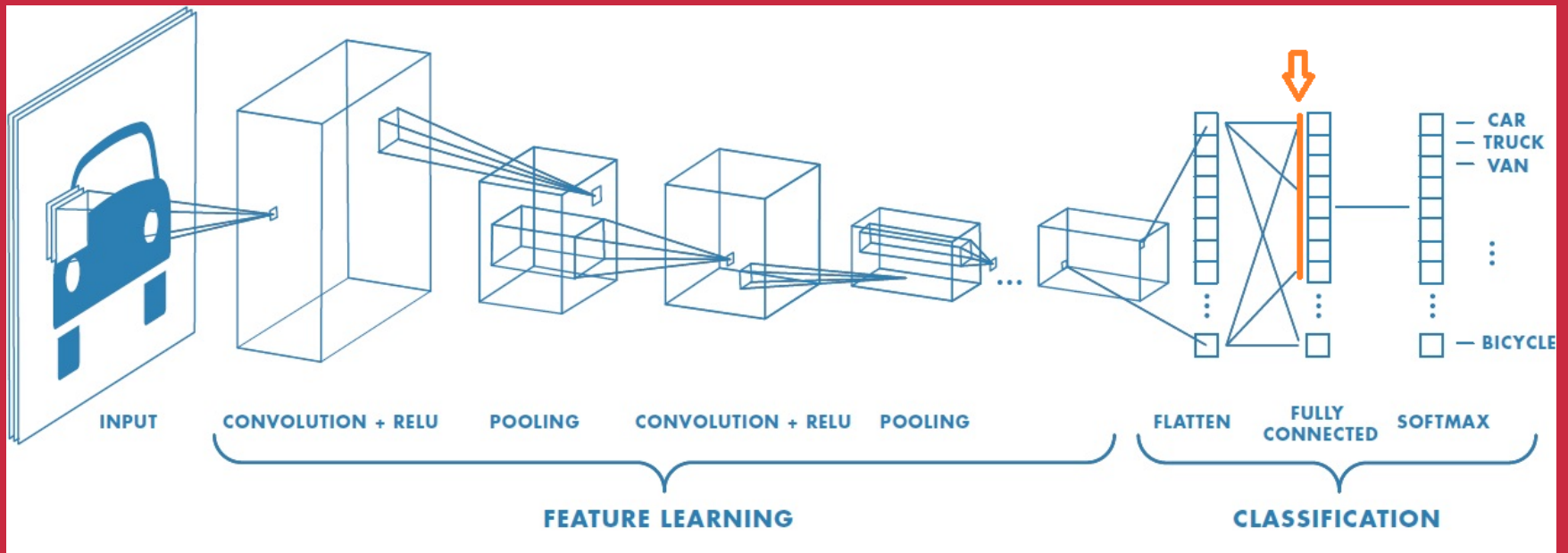
Query

Tensorflow
Embedding Generation of Query Image
FAISS

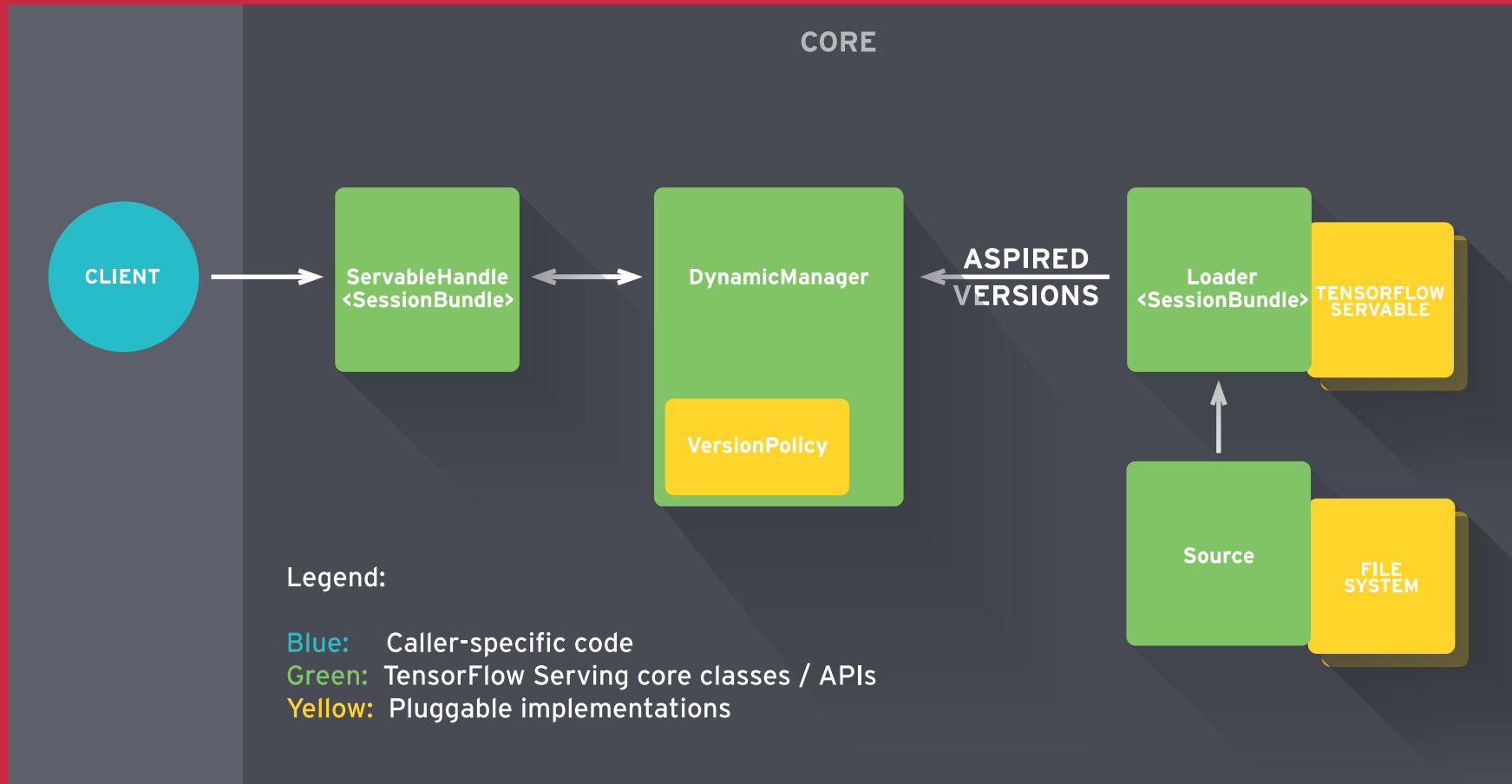
Tensorflow

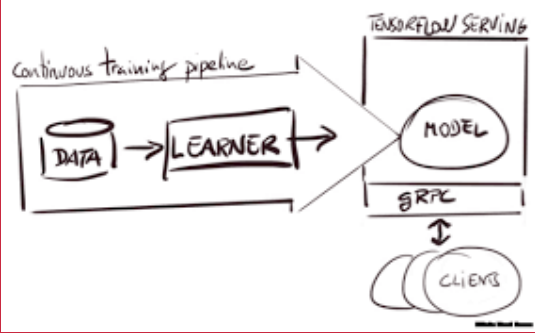
Off-Shelf Solutions

Inception Model
PNasNet Model



Tensorflow Model Serving





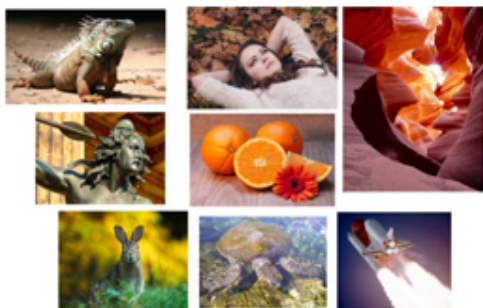
Model Server Architecture



Facebook Artificial Intelligence Similarity Search

FAISS

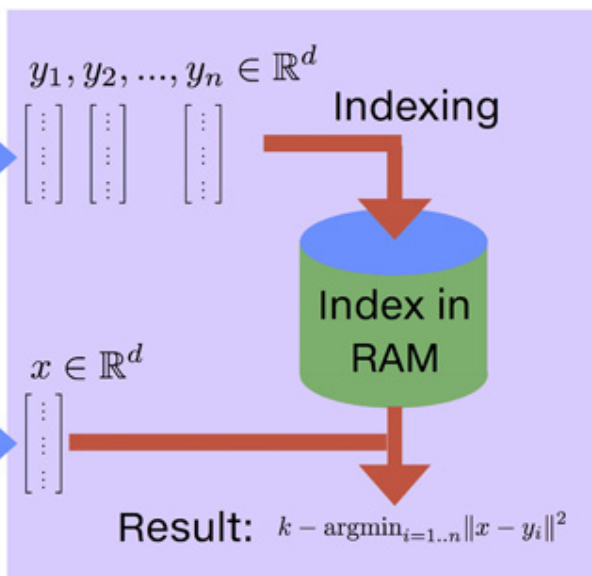
Build index for a collection:



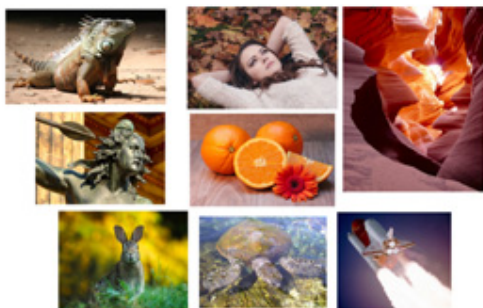
Query:



Media
description



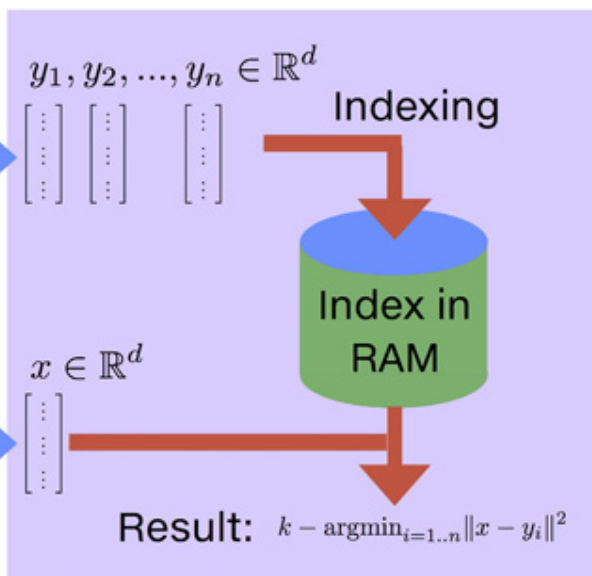
Build index for a collection:

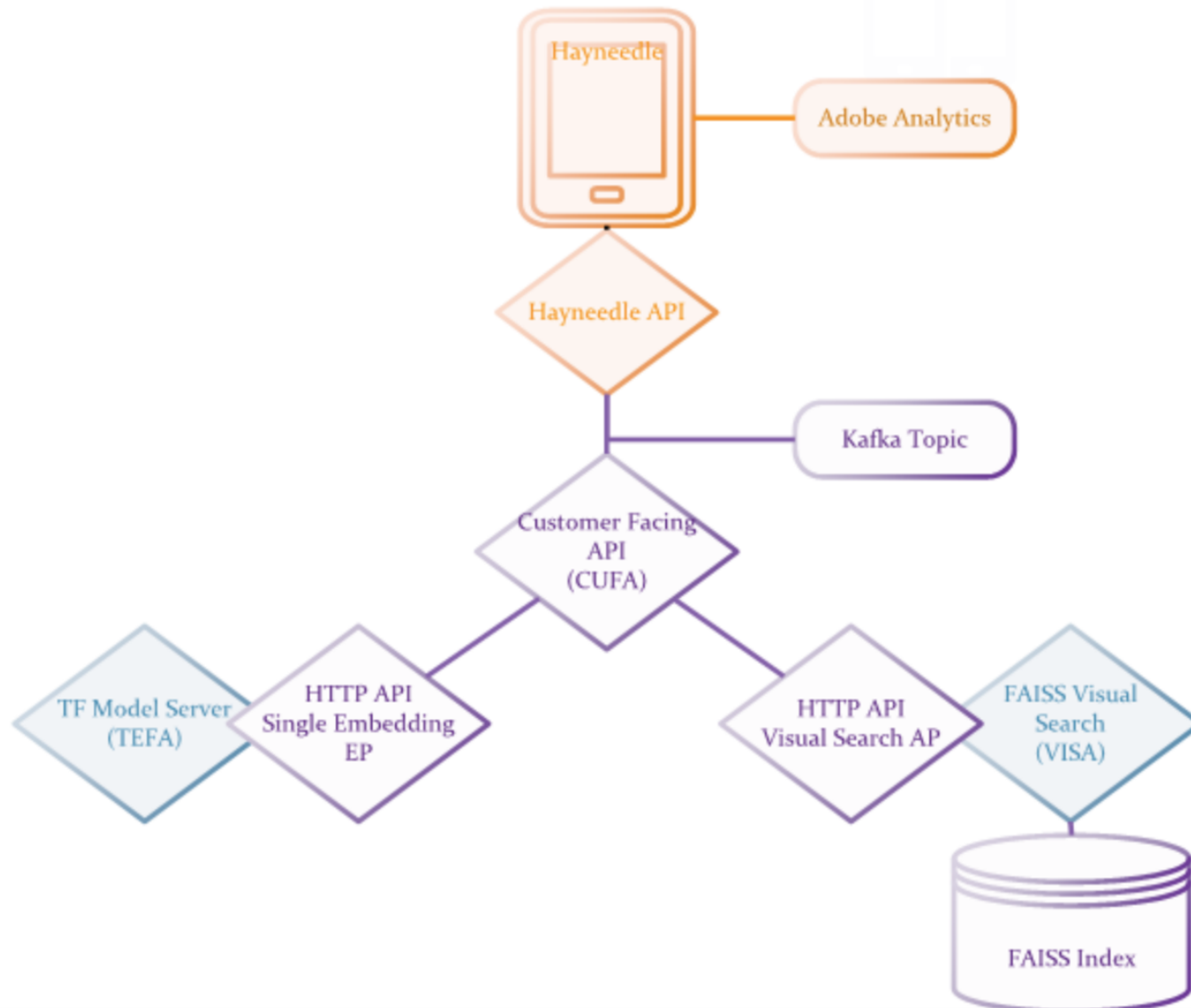


Query:



Media
description





Production Readiness

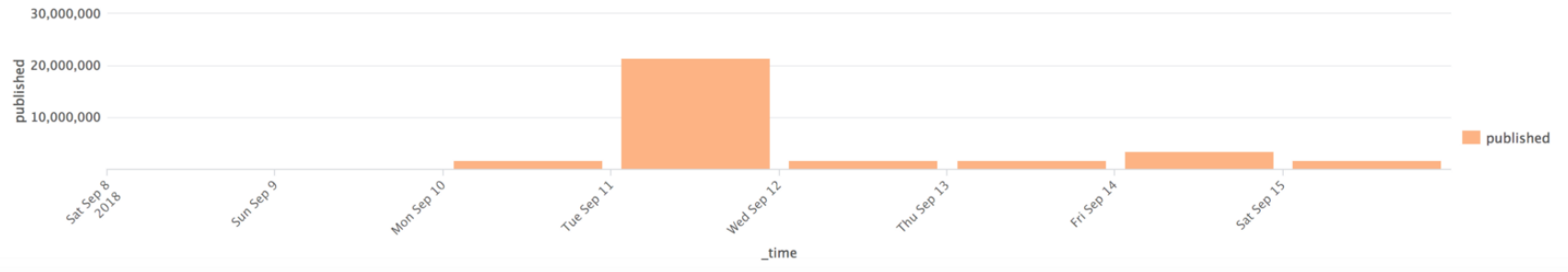
CUFA Statistics

p95_response_time 0.312

total_number_of_requests 11573









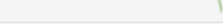


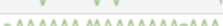

1m ago

Catalog Parser Published Events (per day)



Indexers' Health

Hayneedle Indexers Health

service_name 	sparkline 	activity 	errors 	last_time 
hayneedle-download-catalog-vs		1	0	Sat Sep 15 15:00:37 2018
hayneedle-embeddings-generator		4094	0	Sat Sep 15 15:02:20 2018
hayneedle-faiss-index-builder4		806	0	Sat Sep 15 15:02:19 2018
hayneedle-image-indexer		1930	0	Sat Sep 15 15:02:22 2018
visual-searchapi		98	0	Sat Sep 15 14:57:15 2018
wm-tensorflow-serving-http-server		266	0	Sat Sep 15 15:01:46 2018
wmt-cufa		4630	0	Sat Sep 15 14:58:32 2018
wmt-hayneedle-visual-response-consumer		119	57	Sat Sep 15 15:01:27 2018
wmt-hayneedle-visual-response-uploader2		161	0	Sat Sep 15 15:02:23 2018

Aug 26, 2018 9:27 pm

Trace ID: 517265960555a7a3 Services: 3 Total spans: 14 Spans displayed: 9



SERVICE	SPAN	DURATION
ProfX-CUFA	web_server:image_raw_bytes	674.41 ms
ProfX-CUFA	phased-profx-wm-tensorflow-serving-http-server.nomad.eastus2.prod.jet.network - ai...	328.76 ms
ProfX-TEFA	web_server:get_embeddings_from_raw_image_bytes	299.58 ms
ProfX-TEFA	localhost:9000 - gRPC/unary_unary	278.54 ms
ProfX-CUFA	phased-profx-visual-searchapi.nomad.eastus2.prod.jet.network - aiohttp/POST	110.70 ms
ProfX-VISA	search_through_embedding	73.42 ms
ProfX-CUFA	10.126.200.118:8500 - requests/	4.26 ms
ProfX-CUFA	10.126.200.118:8500 - requests/	4.46 ms
ProfX-CUFA	10.126.200.118:8500 - requests/	5.45 ms

Aug 26, 2018 9:26 pm





Trace ID: 1b594fcde165df2c Services: 3 Total spans: 18 Spans displayed: 9




SERVICE	SPAN	DURATION
ProfX-CUFA	web_server:image_raw_bytes	1.06 s
ProfX-CUFA	phased-profx-wm-tensorflow-serving-http-server.nomad.eastus2.prod.jet.network - ai...	439.82 ms
ProfX-TEFA	web_server:get_embeddings_from_raw_image_bytes	402.82 ms
ProfX-TEFA	localhost:9000 - gRPC/unary_unary	377.06 ms
ProfX-CUFA	phased-profx-visual-searchapi.nomad.eastus2.prod.jet.network - aiohttp/POST	131.14 ms
ProfX-VISA	search_through_embedding	49.87 ms
ProfX-CUFA	10.126.200.178:8500 - requests/	139.33 ms
ProfX-CUFA	10.126.200.178:8500 - requests/	106.40 ms
ProfX-CUFA	10.126.200.178:8500 - requests/	36.53 ms

How does it look?


WOMEN'S MARKET OUTDOOR SALE

hayneedle    

SHOP  THE FIND GALLERY BLOG

Home > Wood Search


visual search results



Belham Living Channing Tufted Arm Chair

\$399⁹⁹

★★★★★



Belham Living Avery Arm Chair with Back ...

\$399⁹⁹



Catalog Image

12:44



Kinfine USA Parson Chair

\$84⁹⁹ ~~\$100.00~~

Sale



Catalog Image



Oakland Living All-Weather Wicker Arm Ch...

Starting at
\$453™



Lloyd Flanders Tobacco All-Weather Wicker...

Starting at
\$1,786™



User Taken Photo

Links

- [Tensorflow Hub](#)
- [FAISS](#)
- [Tensorflow Model Serving](#)

Questions?