

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 

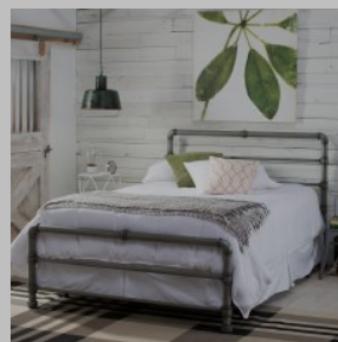


THROUGH SEPT. 23

Bedroom Sale
UP TO 35% OFF

[SHOP NOW](#)

limited time offers



THROUGH SEPTEMBER



THROUGH SEPTEMBER

THE FALL OUTDOOR SALE



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.

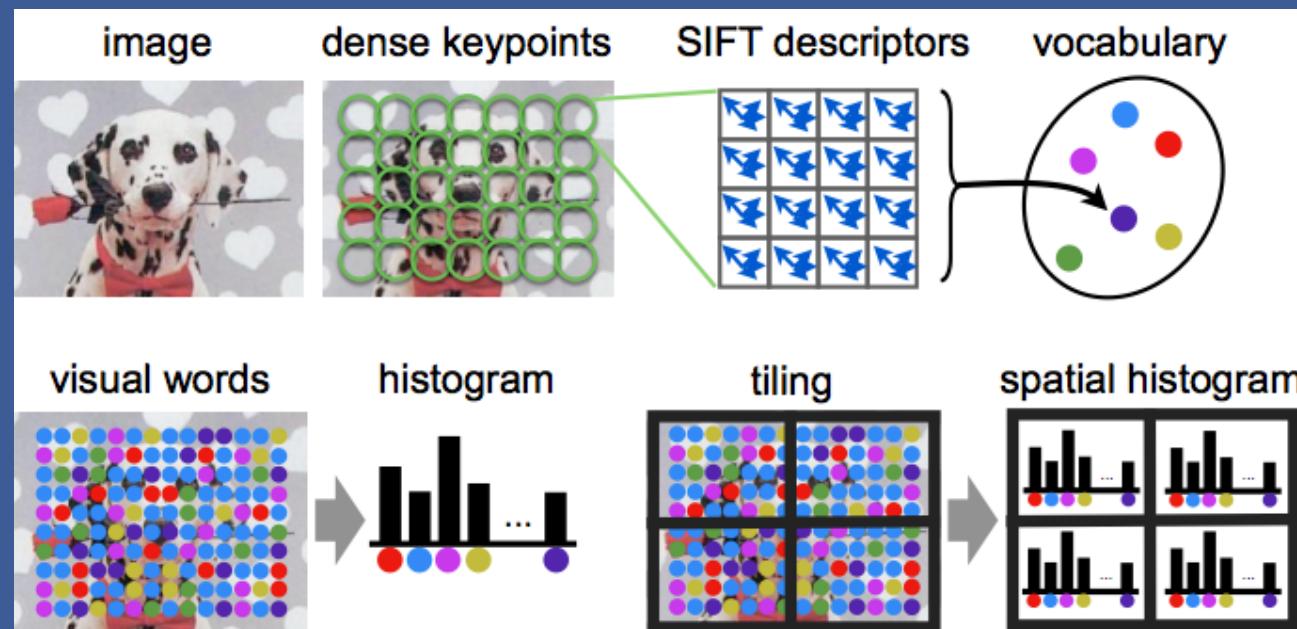
UPLOAD OR TAKE PHOTO

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

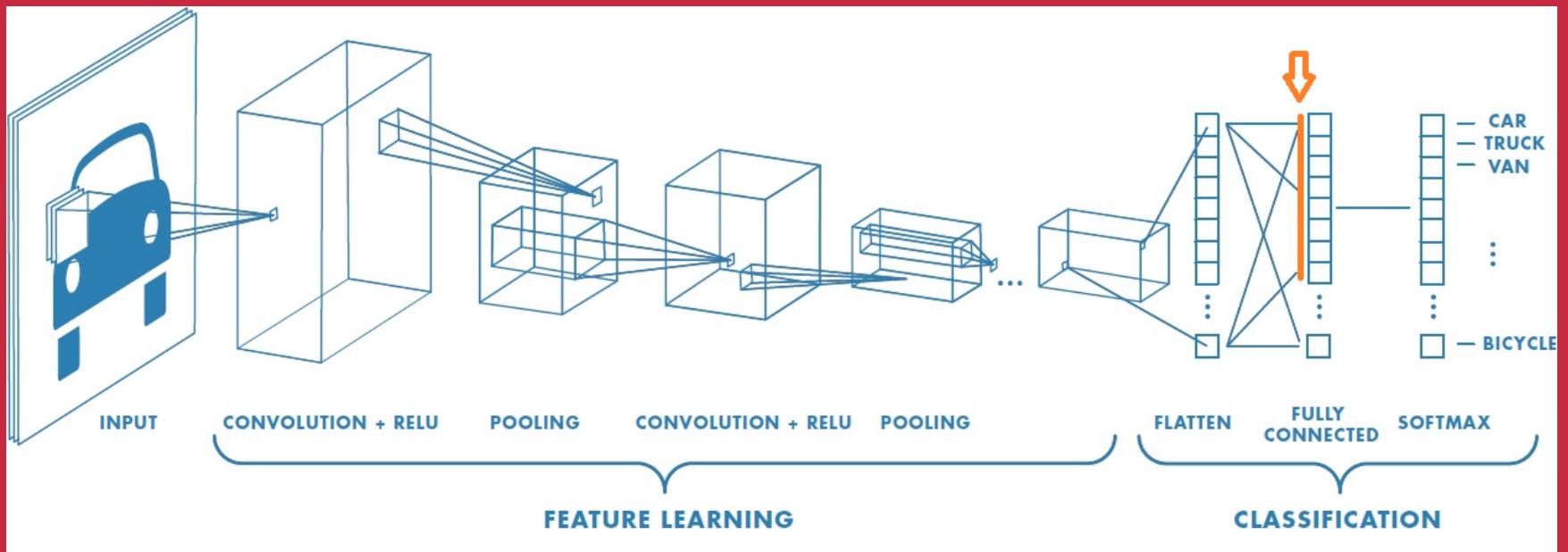
Tensorflow

Off-Shelf Solutions

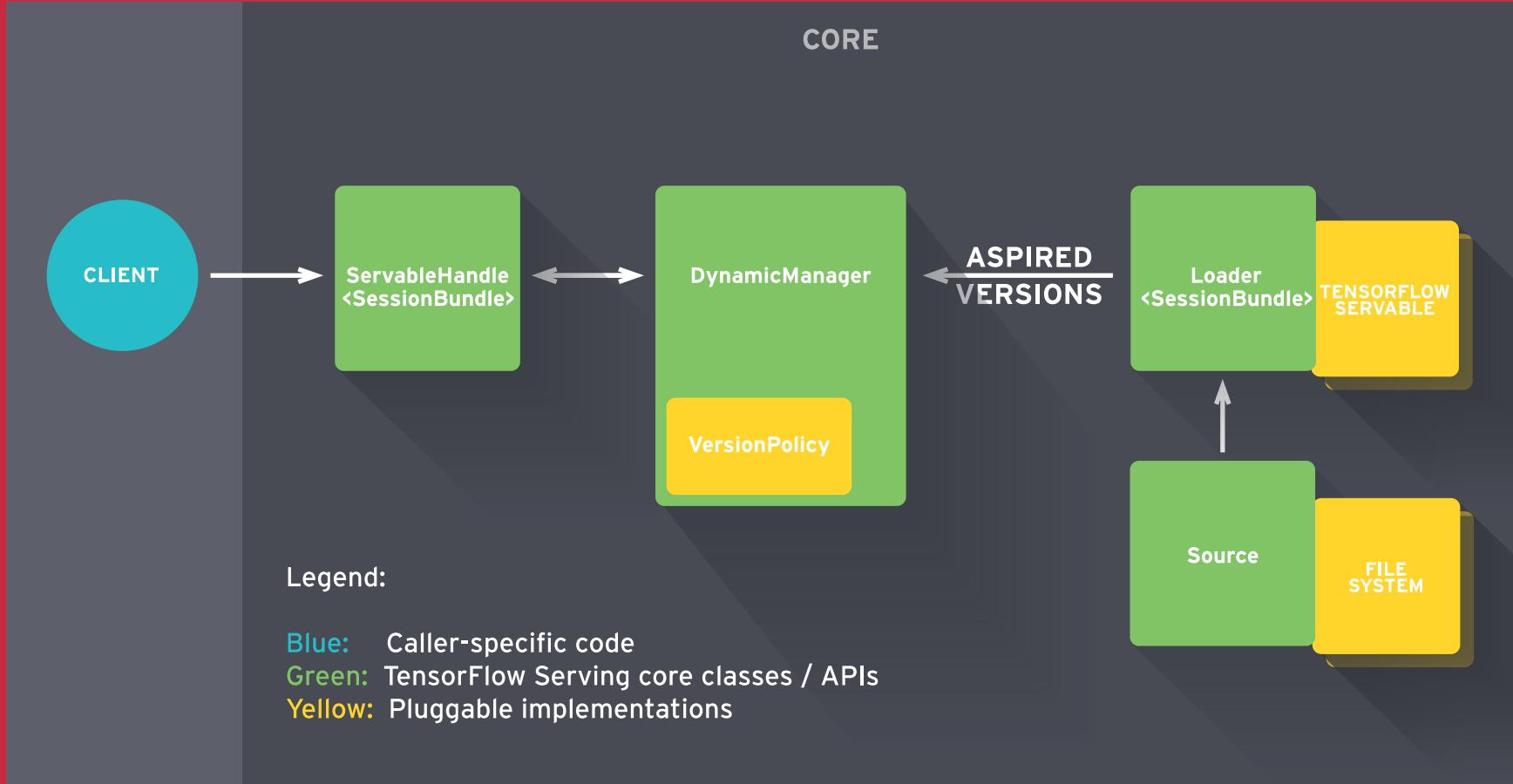
Inception Model
PNasNet Model

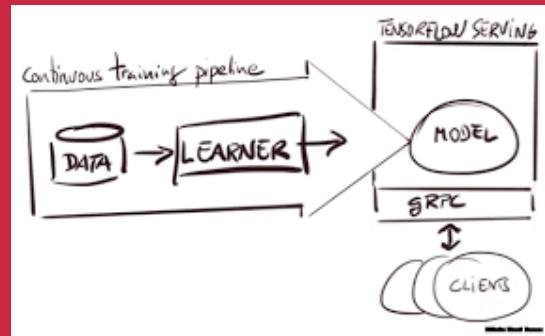
PNasNet through TFHUB

```
module = hub.Module("https://tfhub.dev/google/imagenet/pnasnet_large/classification/2")
height, width = hub.get_expected_image_size(module)
logits = module(images) # Logits with shape [batch_size, num_classes].
```

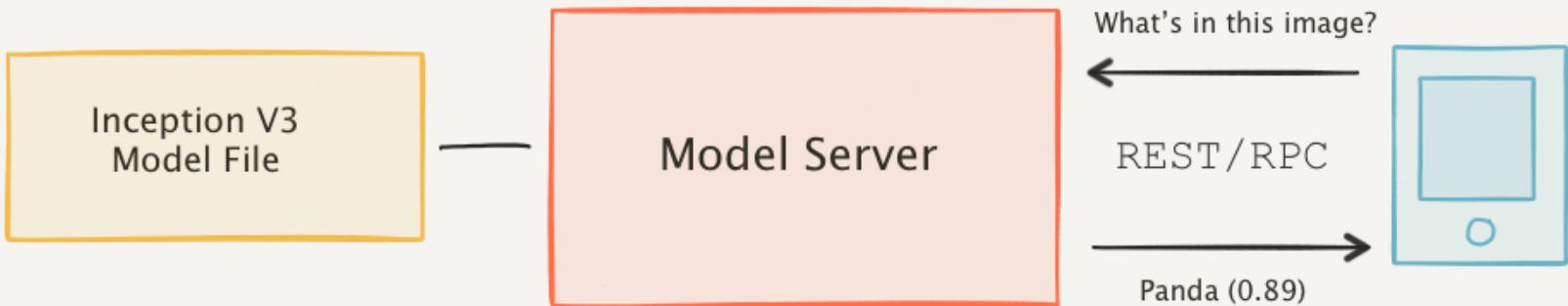


Tensorflow Model Serving





Model Server Architecture



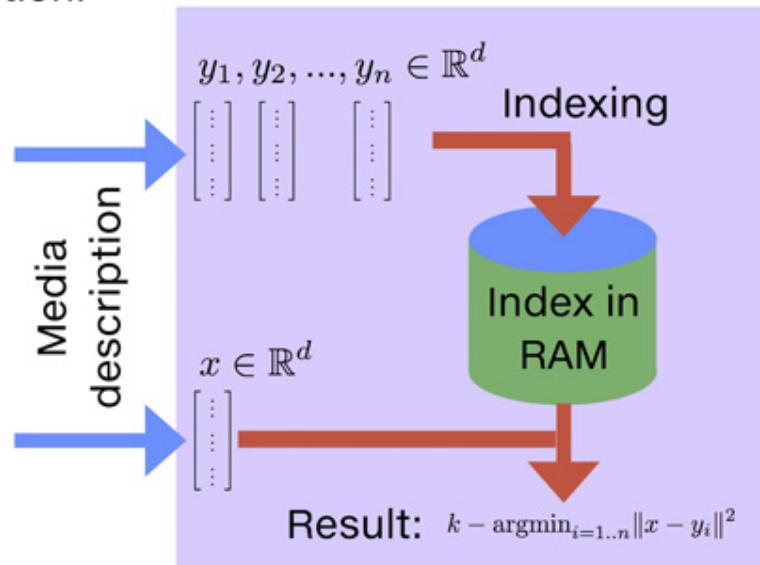
Facebook Artificial Intelligence Similarity Search

FAISS

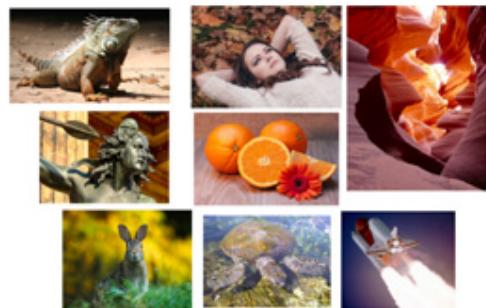
Build index for a collection:



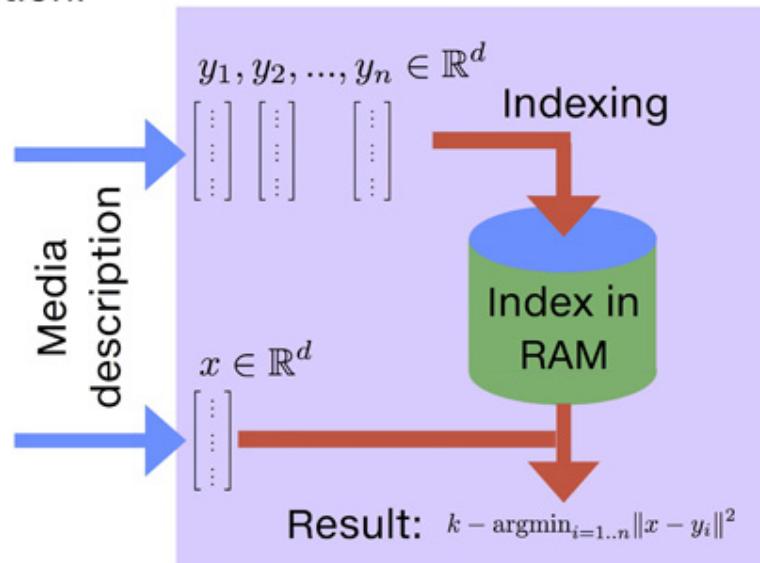
Query:

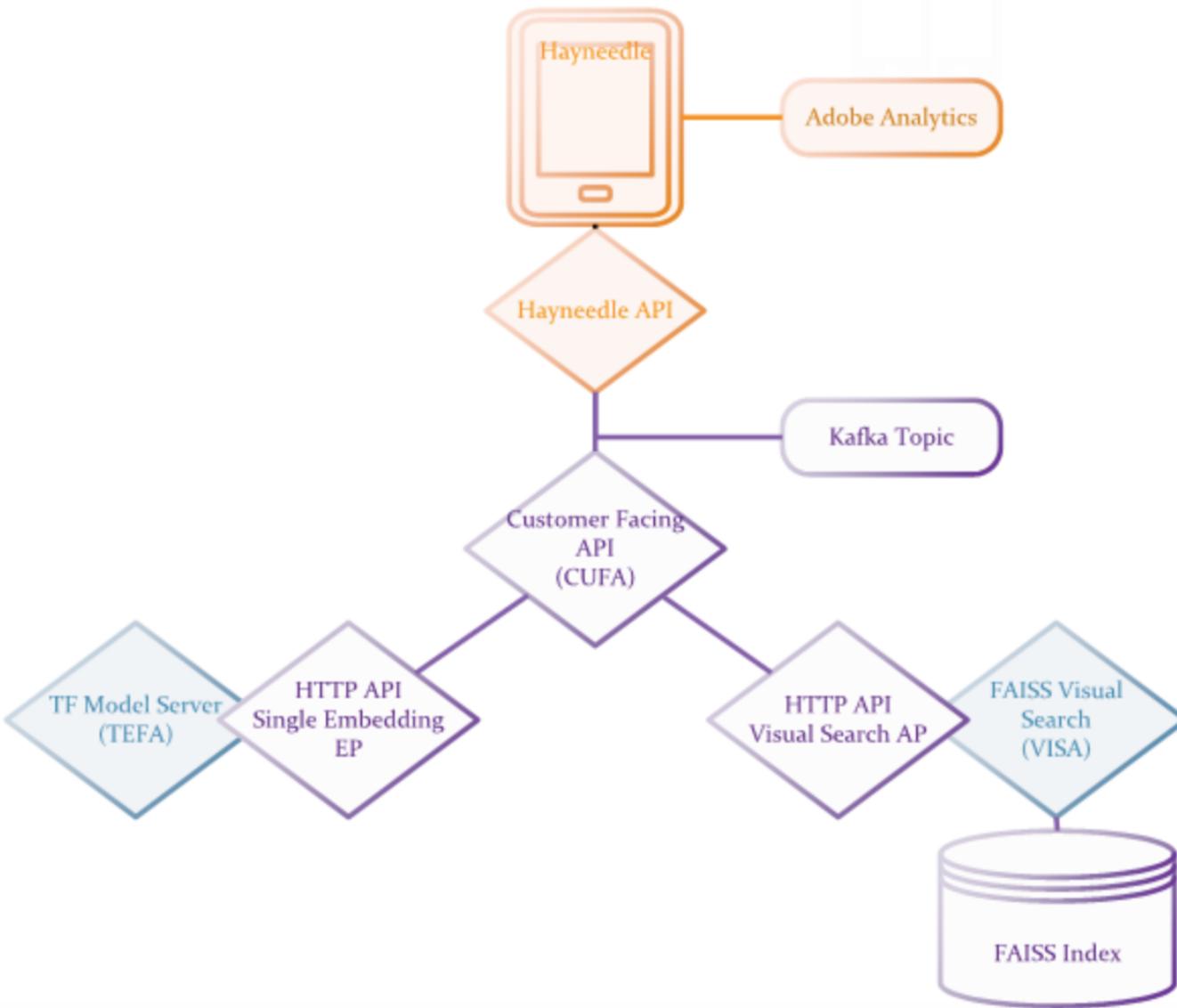


Build index for a collection:



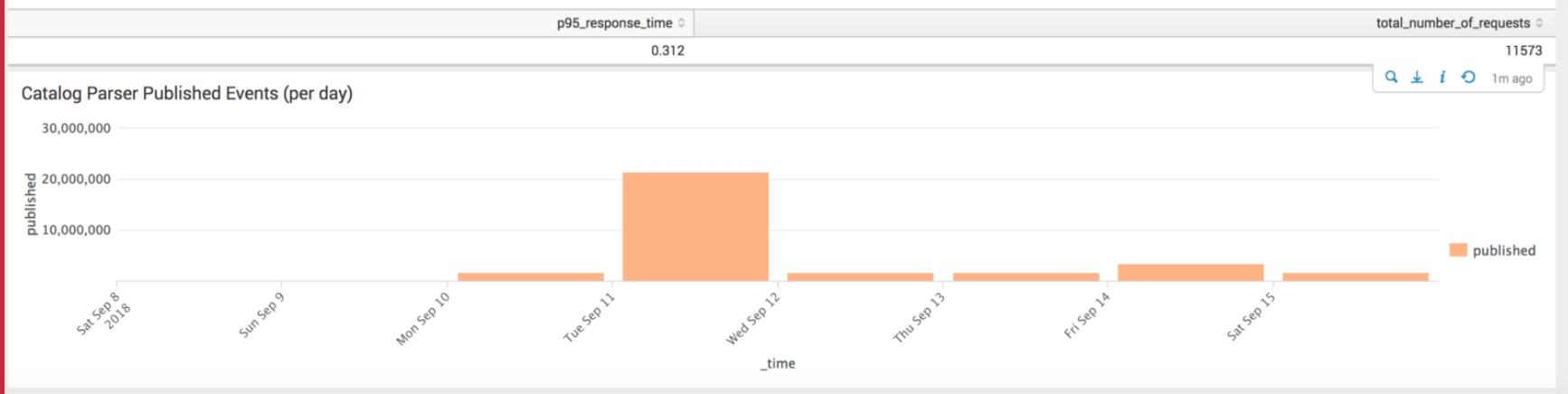
Query:



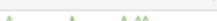


Production Readiness

CUFA Statistics

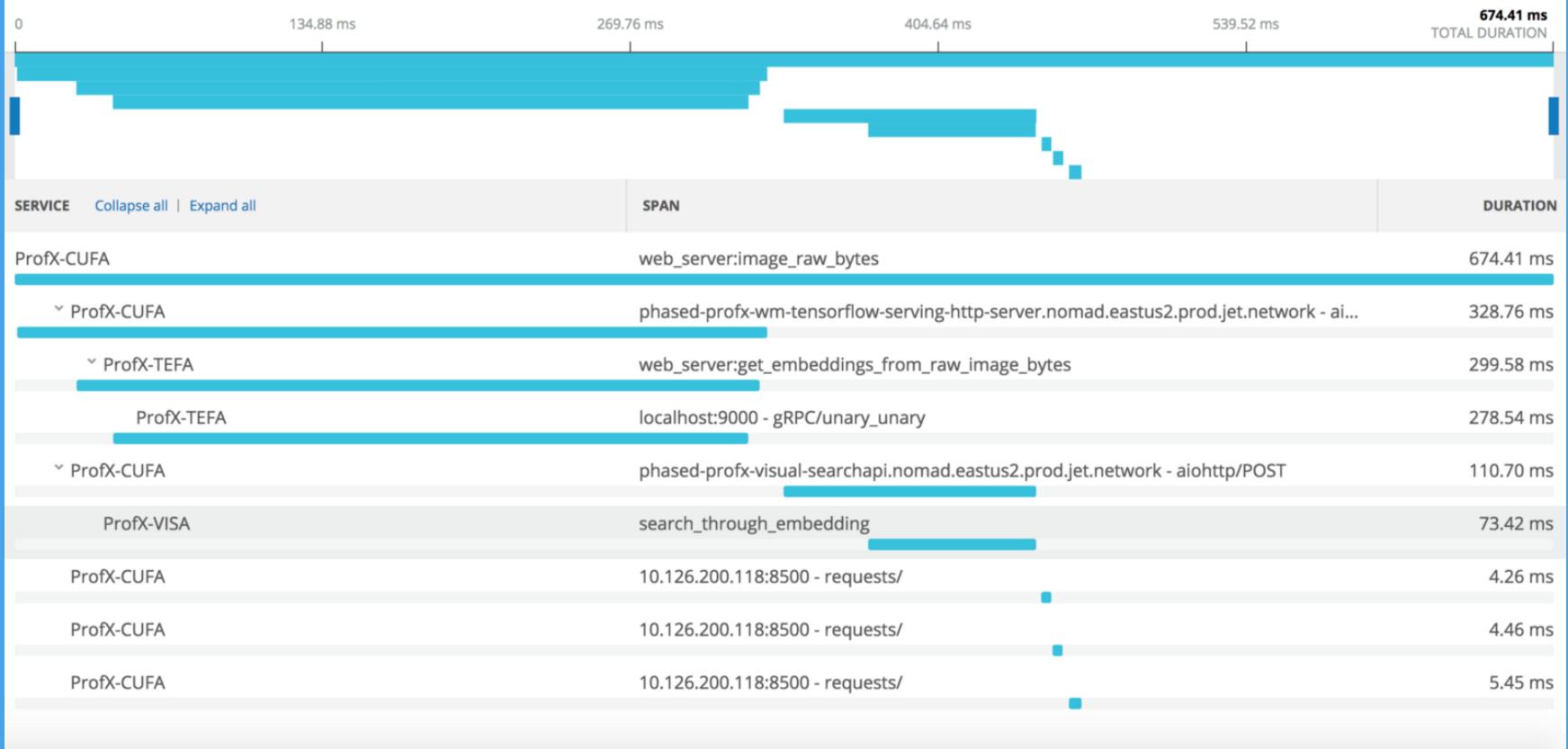


Indexers' Health

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	

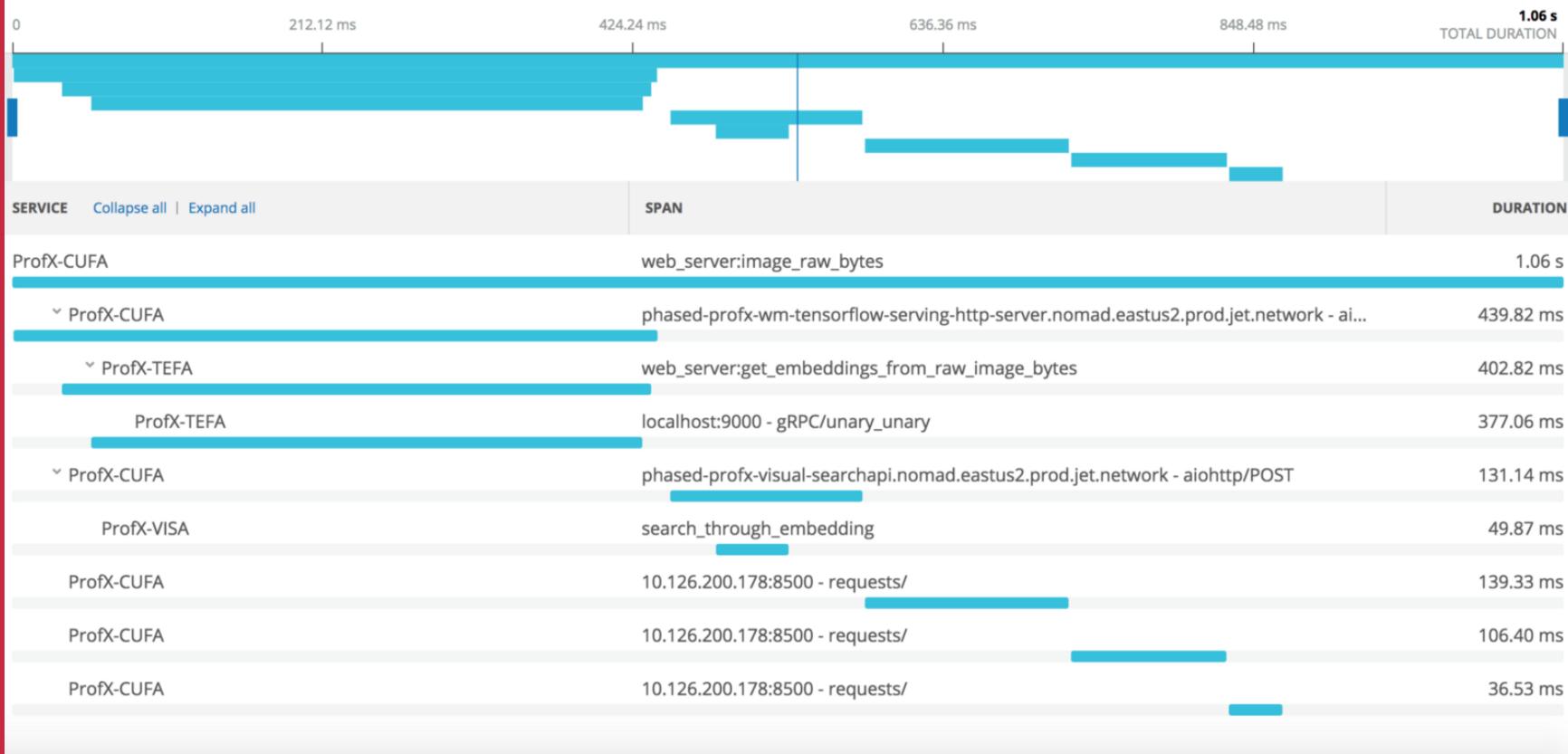
Aug 26, 2018 9:27 pm

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



Aug 26, 2018 9:26 pm

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



How does it look?

The image shows a screenshot of a visual search results page from the website hayneedle.com. At the top, there's a navigation bar with links for "SHOP", "THE FIND", "GALLERY", and "BLOG". Below the navigation, the text "visual search results" is displayed. Two search results for "Belham Living Channing Tufted Arm Chair" are shown, each featuring a large image of the chair in a living room setting. The first result includes the price "\$399" and a rating of "★★★★★". A large gray arrow points from the catalog image on the right towards the search results on the left. On the far right, a blue button labeled "Catalog Image" is visible.

Belham Living Channing Tufted Arm Chair

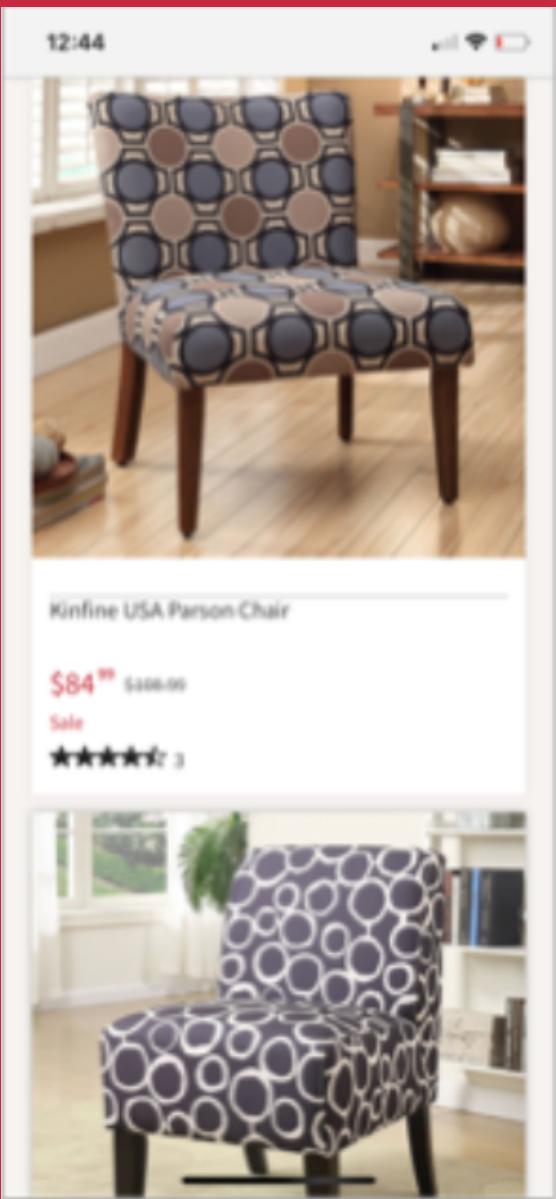
\$399^W

★★★★★

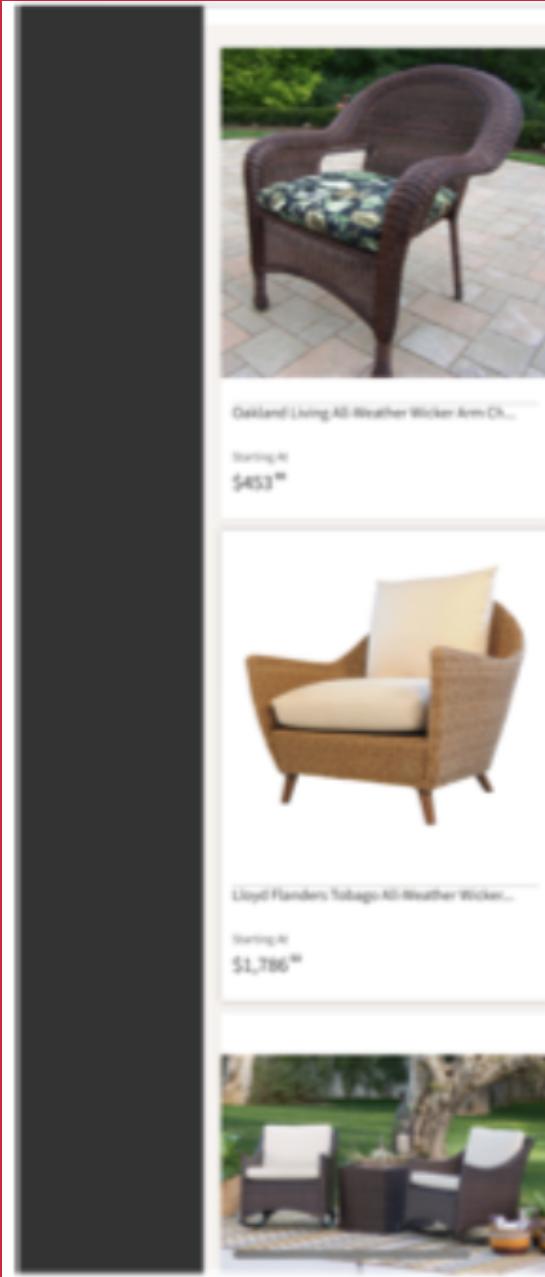
Belham Living Avery Arm Chair with Back ...

\$399^W

Catalog Image



Catalog Image



User Taken Photo

Links

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

Questions?