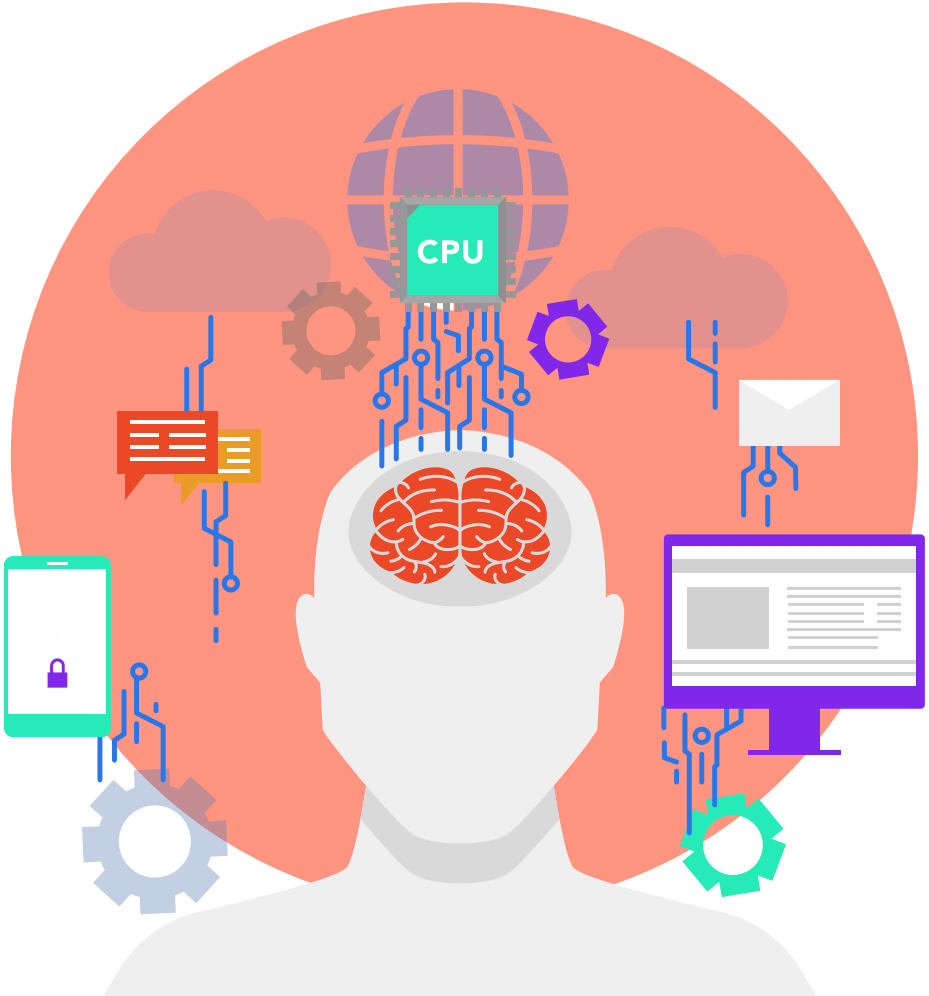


Product recognition AI

Mariam Sayed Ahmad
Mahmoud Nasser

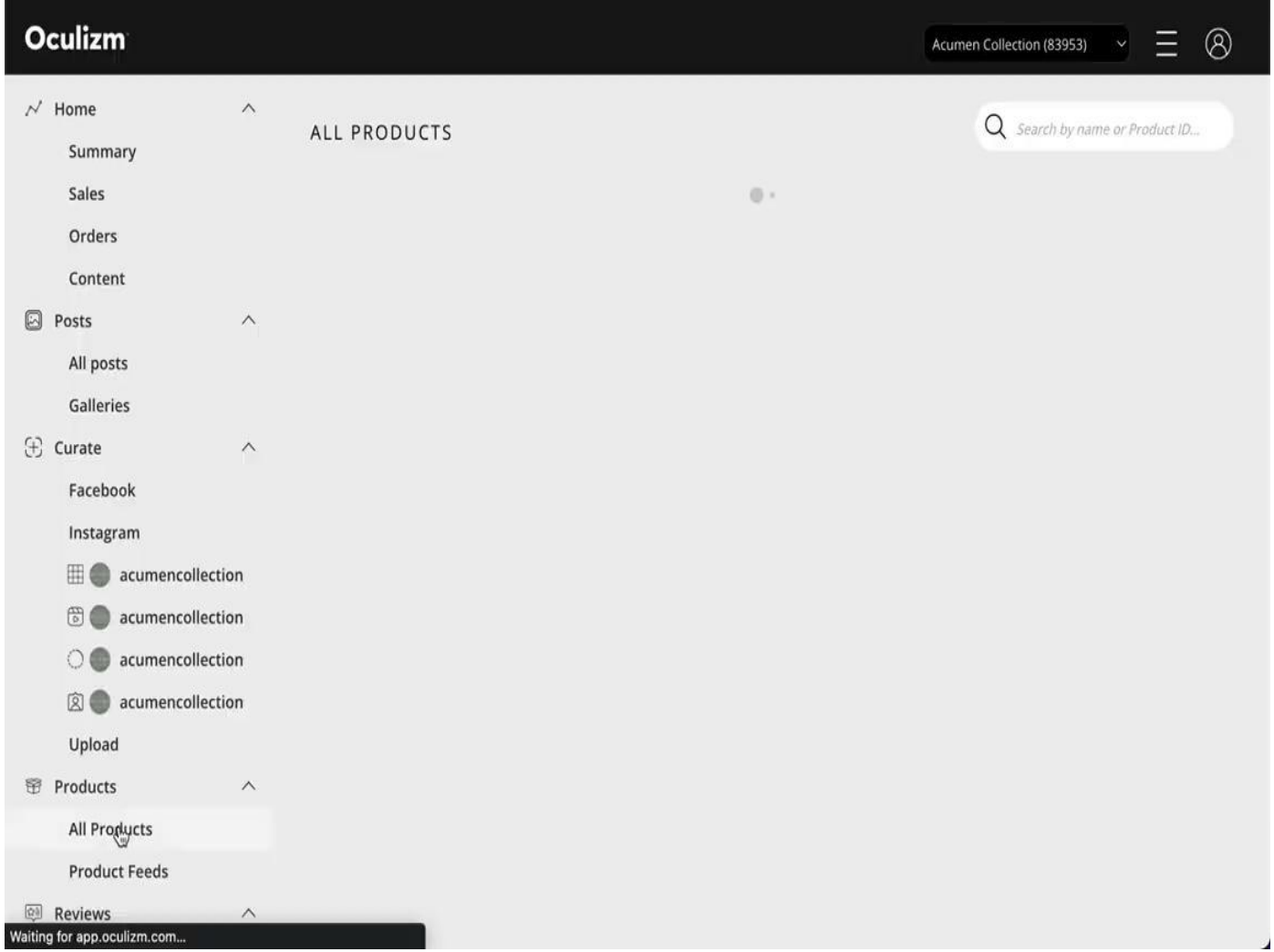
Problem statement

Manual Tagging

- Manual Product tagging is a time consuming task, it involves:
  - Searching for each product label
  - Searching for similar products
  -

Automatic Tagging

- Streamline business needs
- More efficient


Oculizm
Acumen Collection (83953)
Home
Summary
Sales
Orders
Content
Posts
All posts
Galleries
Curate
Facebook
Instagram
acumencollection
acumencollection
acumencollection
acumencollection
Upload
Products
All Products
Product Feeds
Reviews
ALL PRODUCTS
Search by name or Product ID...
Waiting for app.oculizm.com...

Proposed Solution

Object Detection

Detect desired objects

Feature extraction

Extract image embeddings

Cosine Similarity

Find similar product matches

Our Approach

Object Detector

Grounding DINO

Similarity Detector

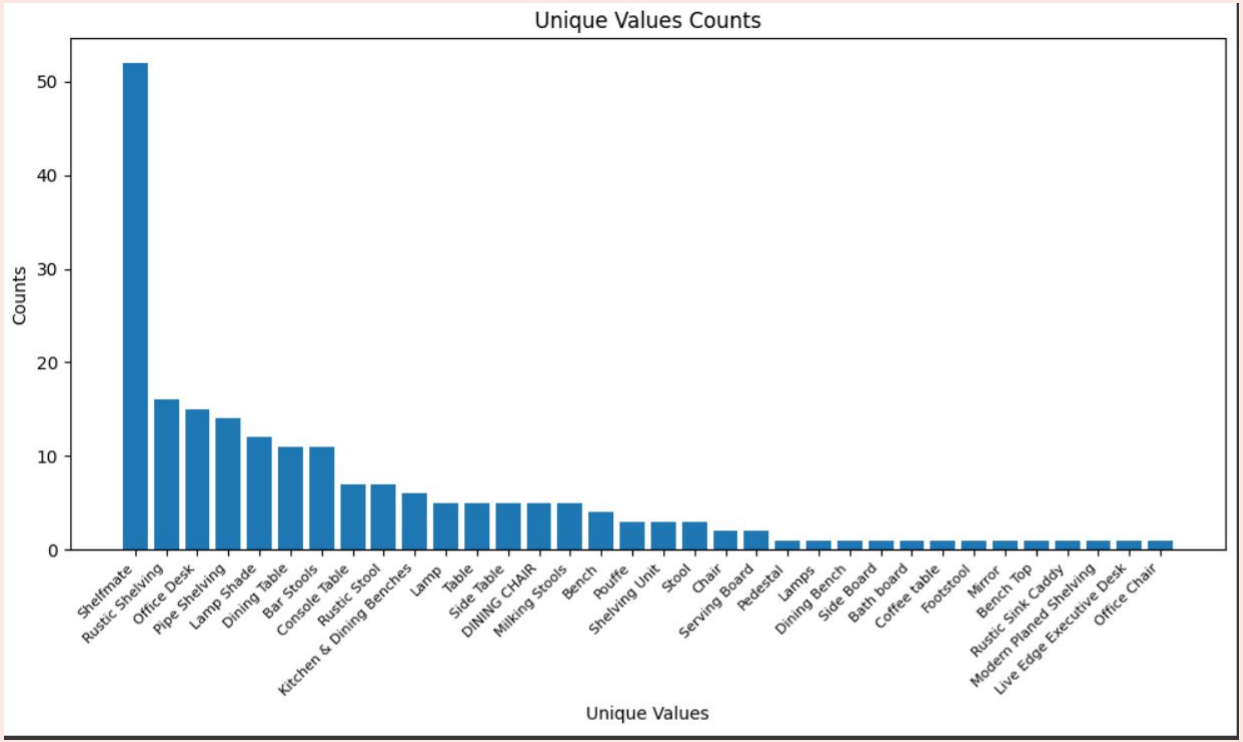
PyTorch

OpenAI CLIP

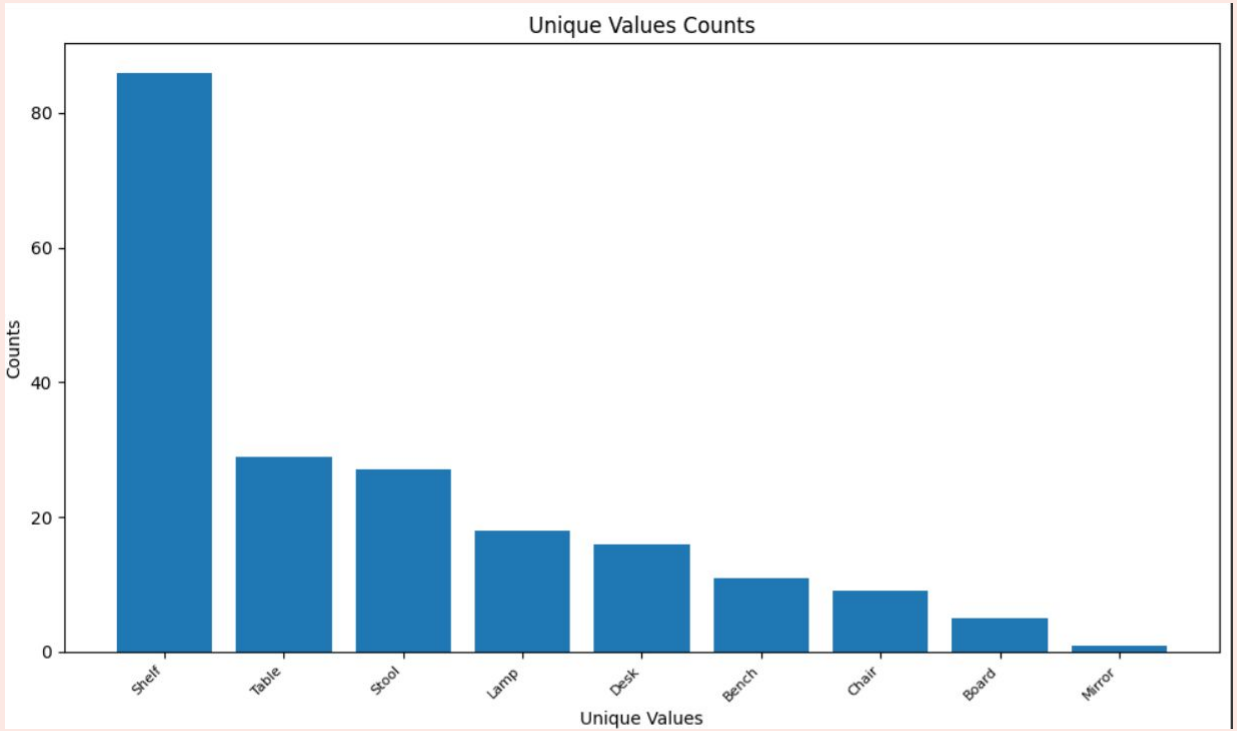
Transformers

Products Recommander

Data Before Cleaning



Data After Cleaning




1
Object Detection

What's grounding DINO

Grounding Dino

Zero-Shot Object Detection

detecting objects even when they are not part of the predefined set of classes in the training data

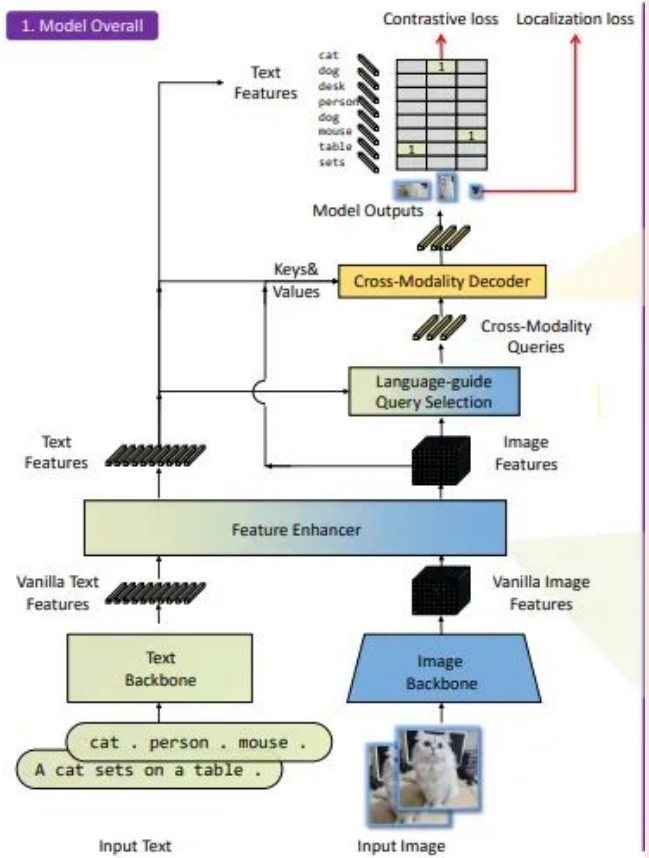
Referring Expression Comprehension (REC)

Identifying and localizing a specific object or region within an image is based on a given textual description

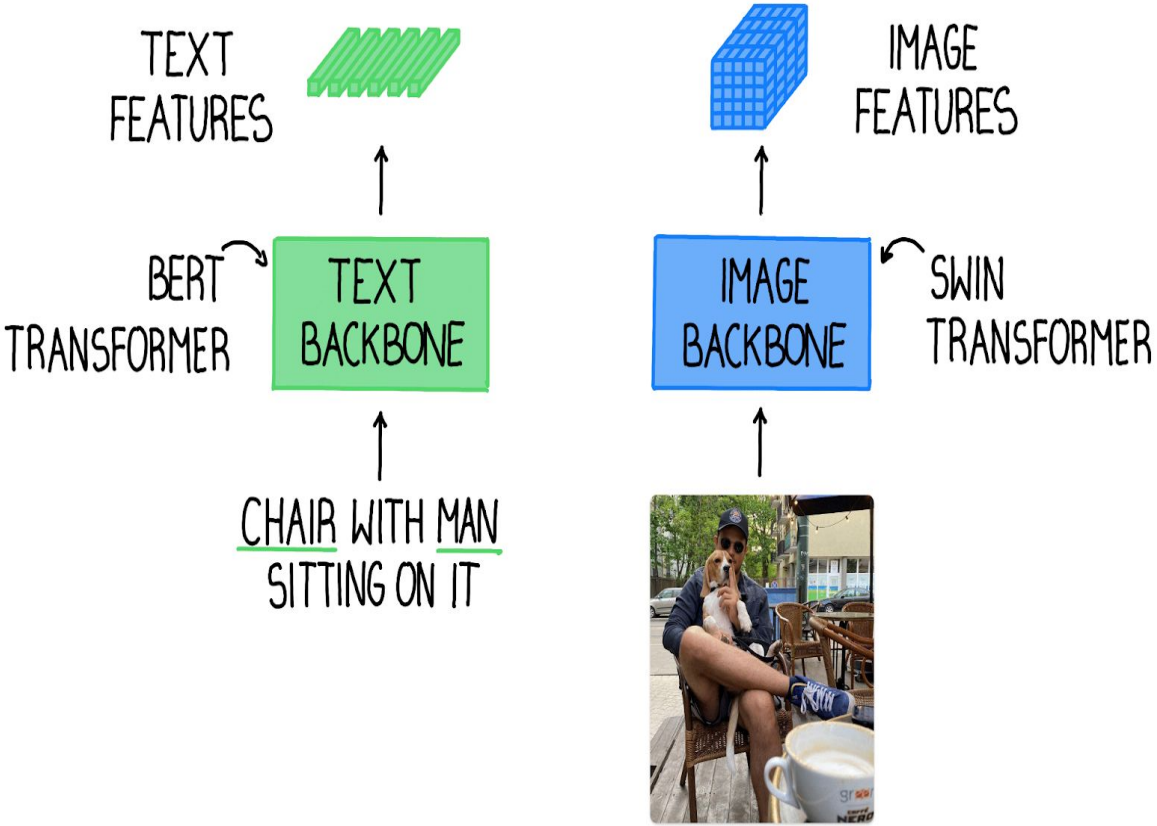
Elimination of Hand-Designed Components

simplifies the object detection pipeline by removing the need for hand-designed components

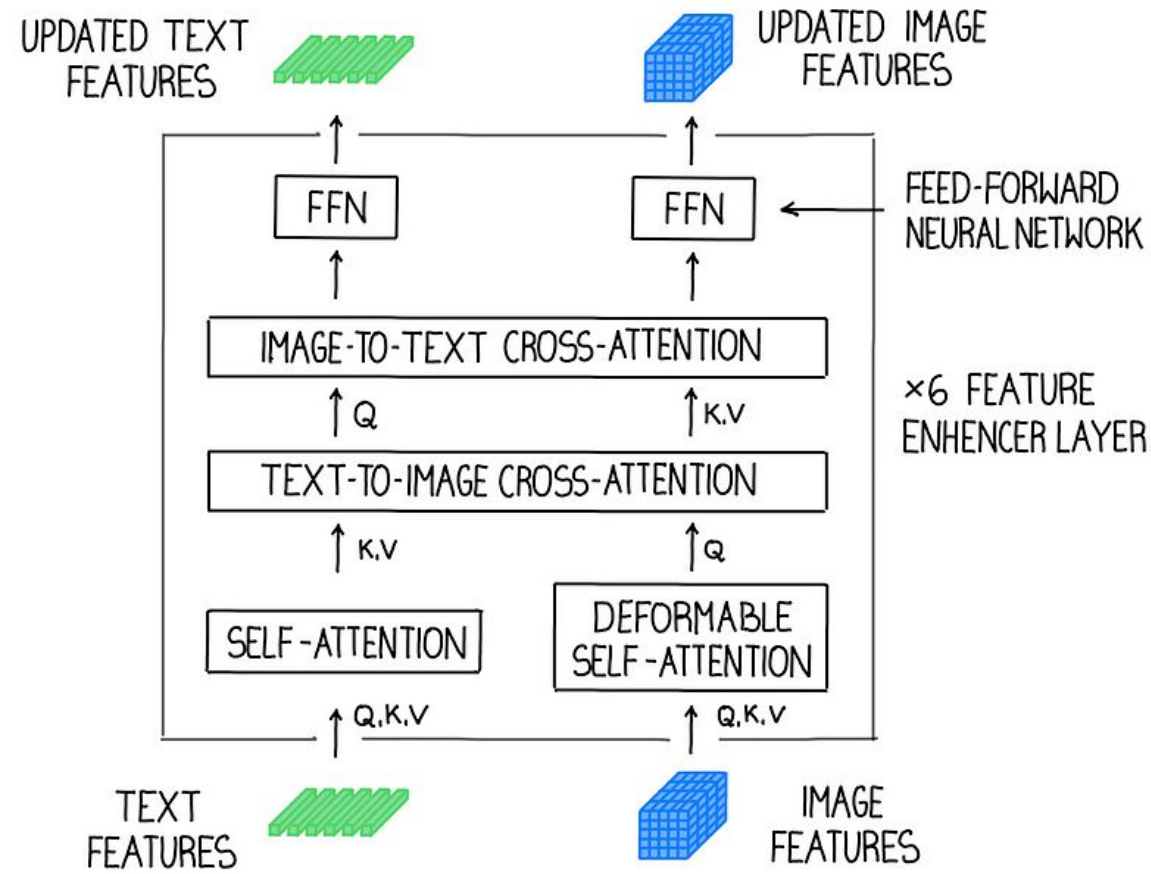
Grounding dino architecture



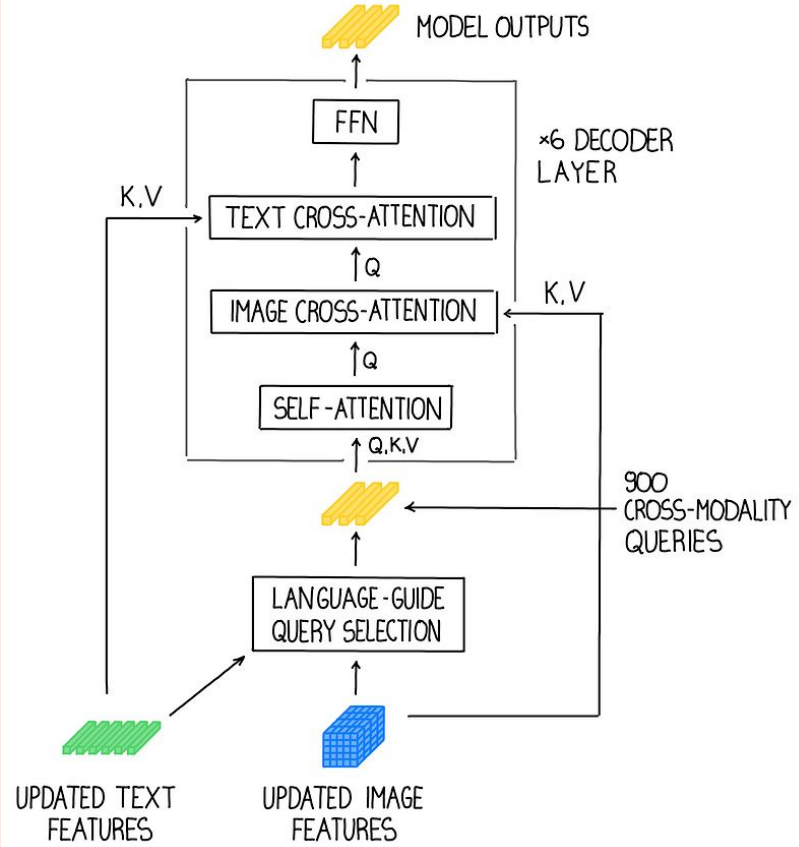
Grounding dino Text and Image Backbone



Grounding dino Feature enhancer



Grounding dino language-guided query selection and cross-modality decoder



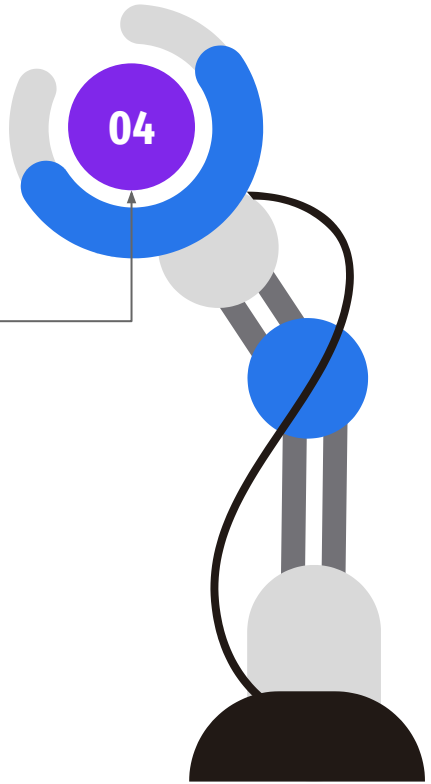
How it works

01 Identify the objects that are mentioned in the text prompt

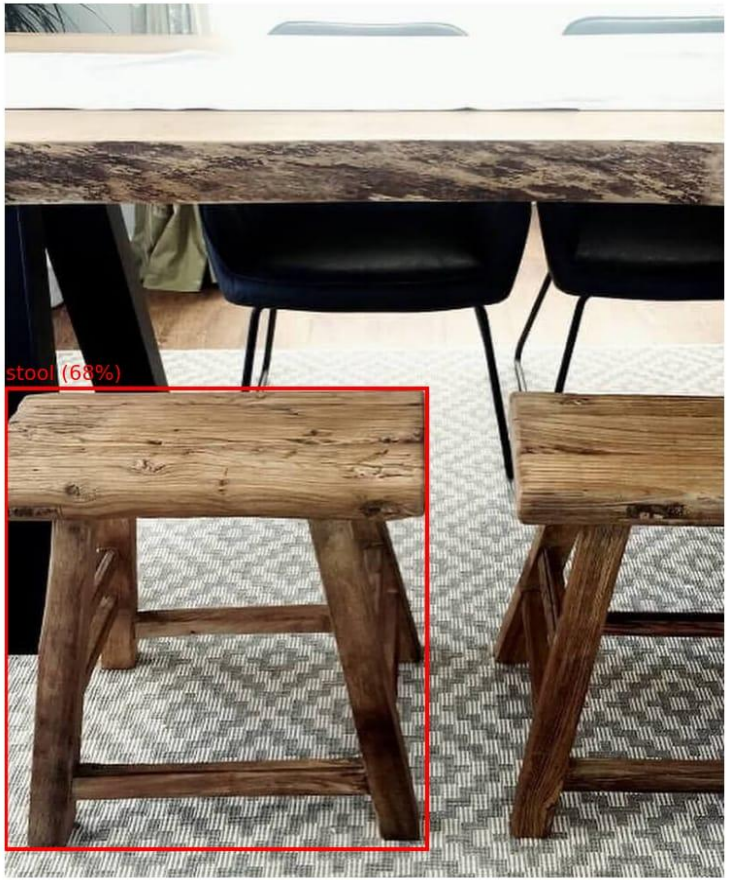
02 Generate a set of object proposals for each object

03 Return the score for each project proposal

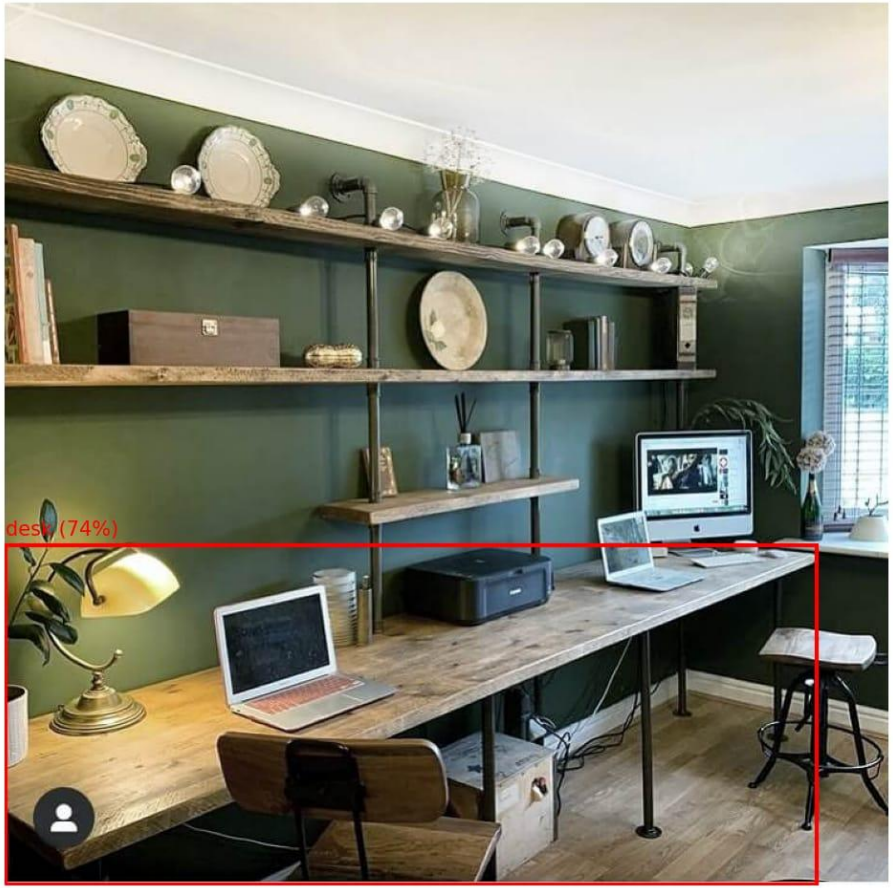
04 select the top-scoring object proposals as the final detections



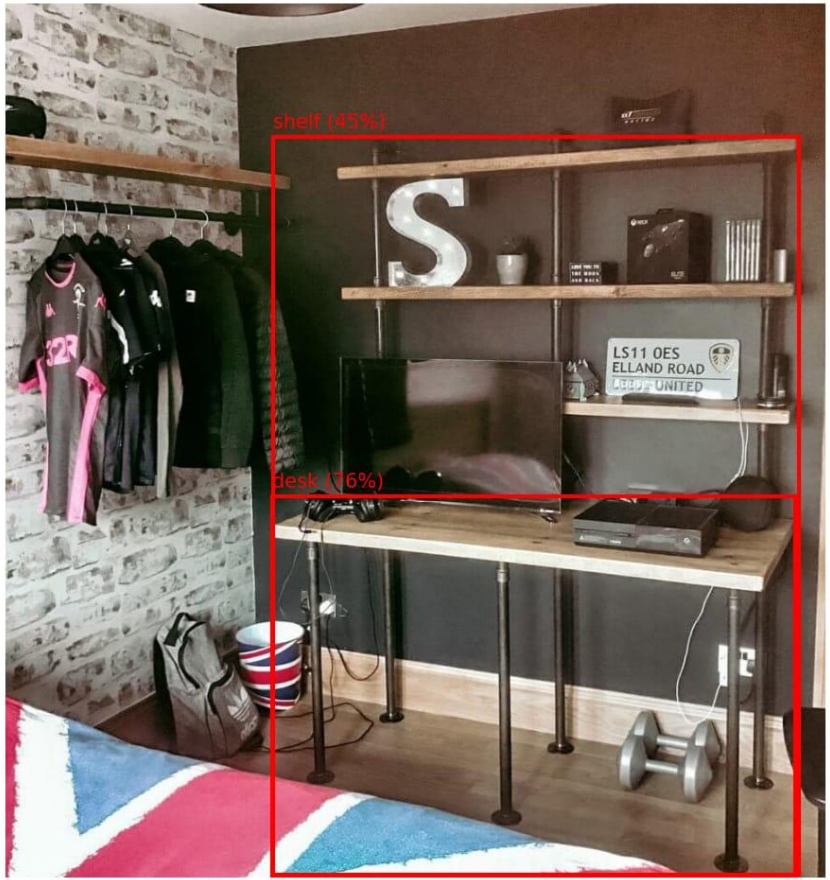
Example 1



Example 2



Example 3




2
Feature extraction

What’s Clip(Contrastive Language–Image Pre-training)

01

Clip is a neural network

built on hundreds of millions of images and captions,

02

can return the best caption given an image

03

CLIP is a bridge between CV and NLP

Clip image embeddings

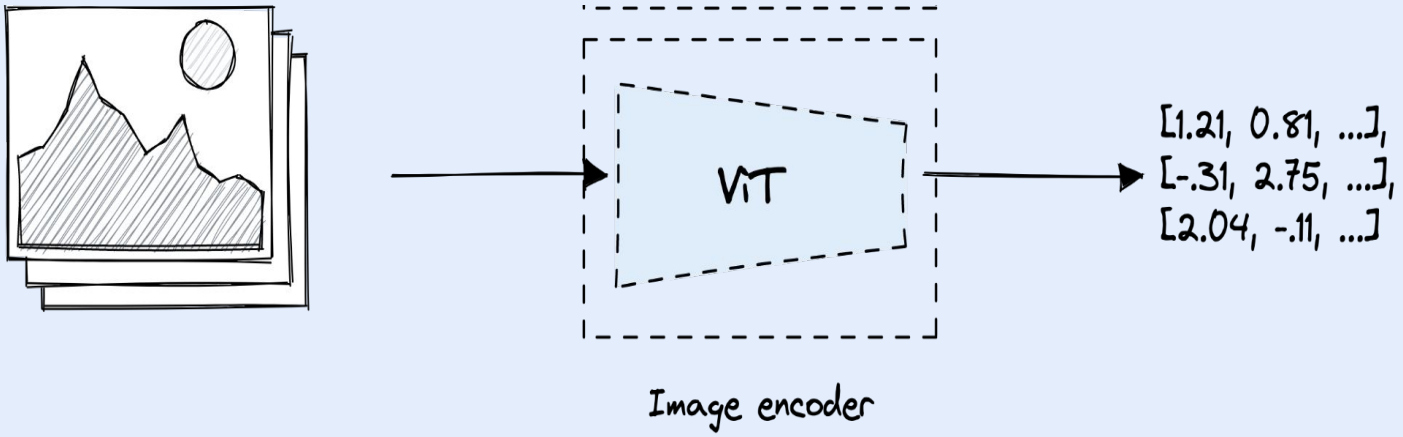
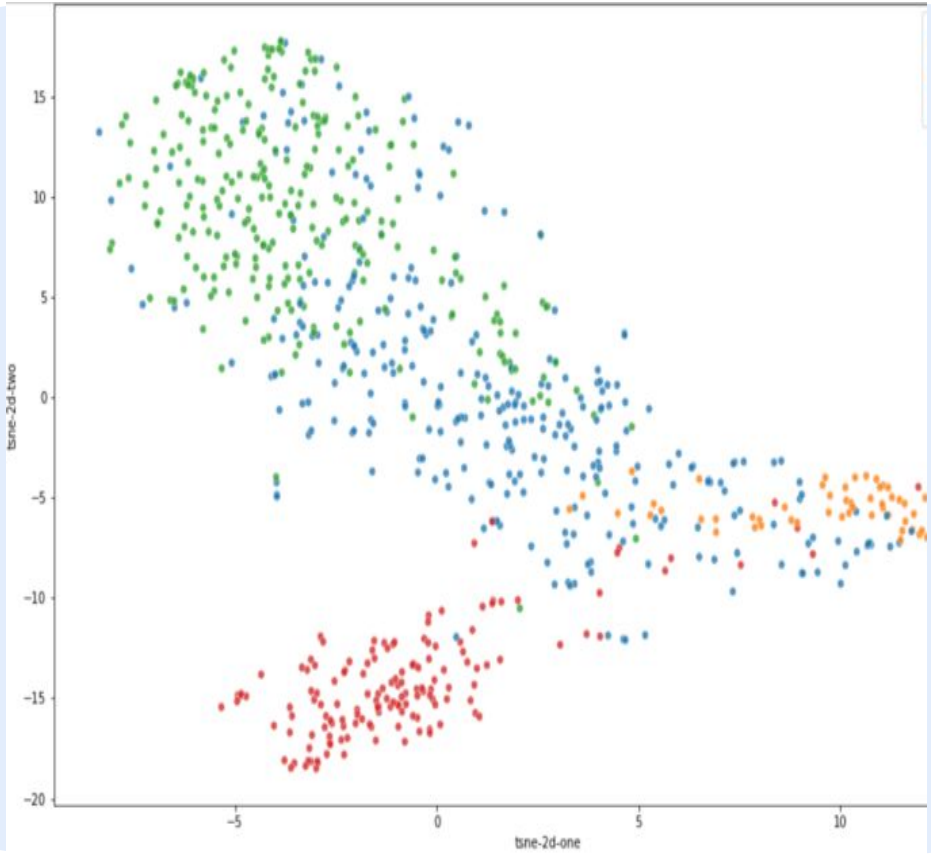
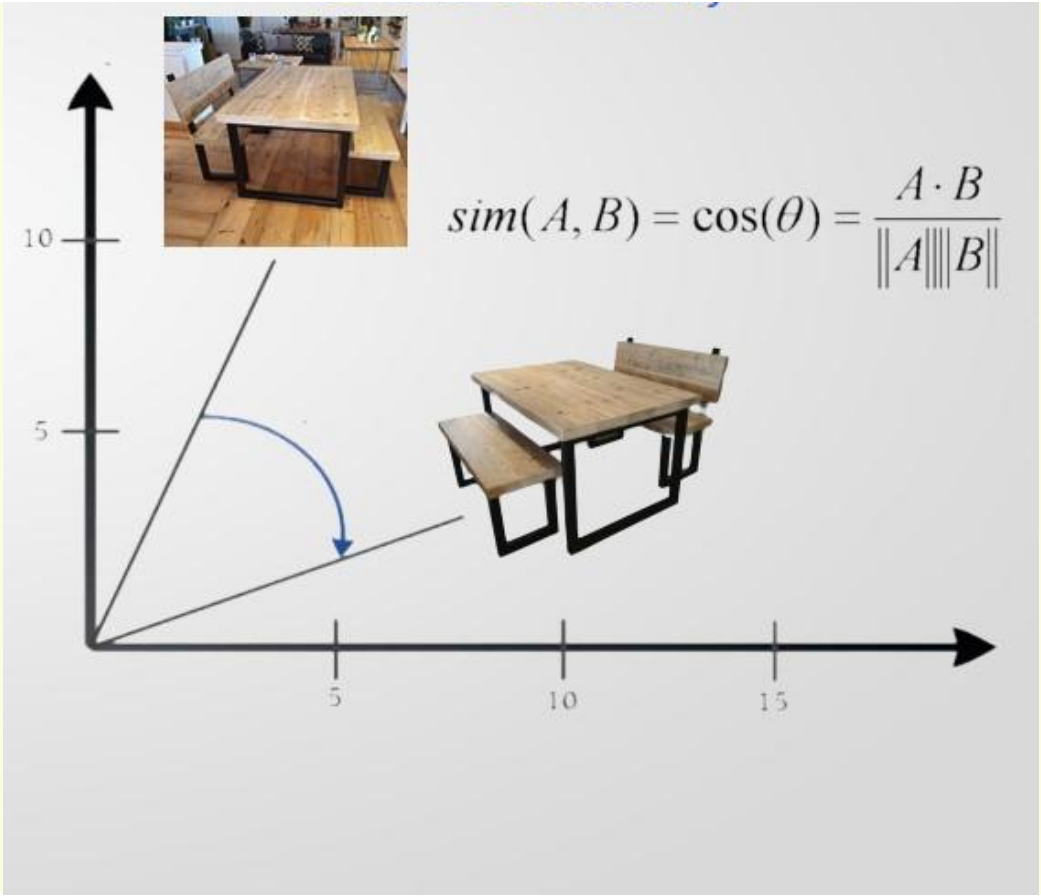


Image Embeddings

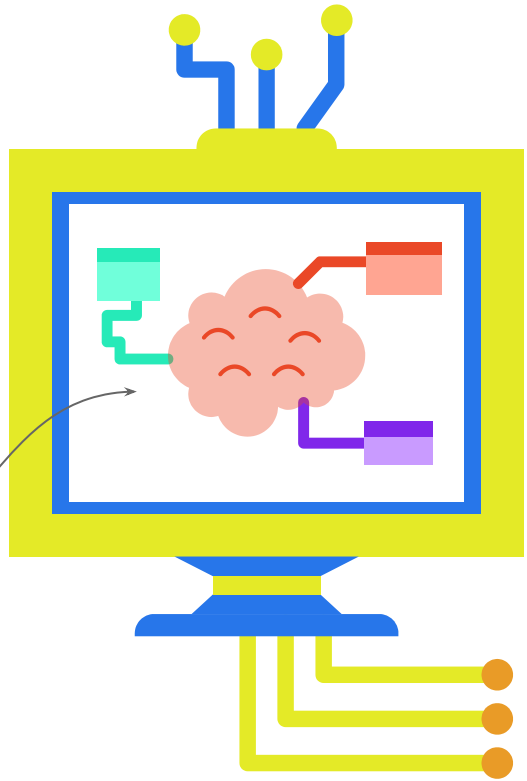



3
Cosine Similarity

What's cosine similarity



Similarity pipeline



- transform
- Embedding
- Label

- Recom 1
- Recom 2
- Recom 3

Example

Similarity: 79%
ID: 4632199233591

Similarity: 77%
ID: 6622128472119

Similarity: 75%
ID: 4290573697079

Similarity: 75%
ID: 4465363648567

Example

Similarity: 79%
ID: 6624599736375

Similarity: 79%
ID: 6871472537655

Similarity: 77%
ID: 6820334108727

Similarity: 77%
ID: 3528439038016

Example

Input Image table (table)

Similarity: 87%
ID: 6624603111479

Similarity: 84%
ID: 4632992907319

Similarity: 84%
ID: 4453882724407

Similarity: 83%
ID: 4467025641527

Example

Input Image table (table)

Similarity: 87%
ID: 6624603111479

Similarity: 84%
ID: 4632992907319

Similarity: 84%
ID: 4453882724407

Similarity: 83%
ID: 4467025641527

Deployment

Future Work

Our roadmap includes:

1. Expanding the model to diverse product categories like clothing.
2. fine-tuning the grounding DINO approach through semi-supervised learning, effectively bridging labeled and unlabeled data.
3. Enhance evaluation metrics by introducing a new dimension for measuring similarity, ensuring a more comprehensive assessment.

THANK YOU!

Q&A