# Zero shot learning

Generative AI and Cybersecurity

# Making AI more human

# What is Zero Shot Learning !?

Live Demonstration

Advocaat

Soma

Minpō

# What is

?

Advocaat - A traditional Dutch beverage made from eggs, sugar, and cognac.

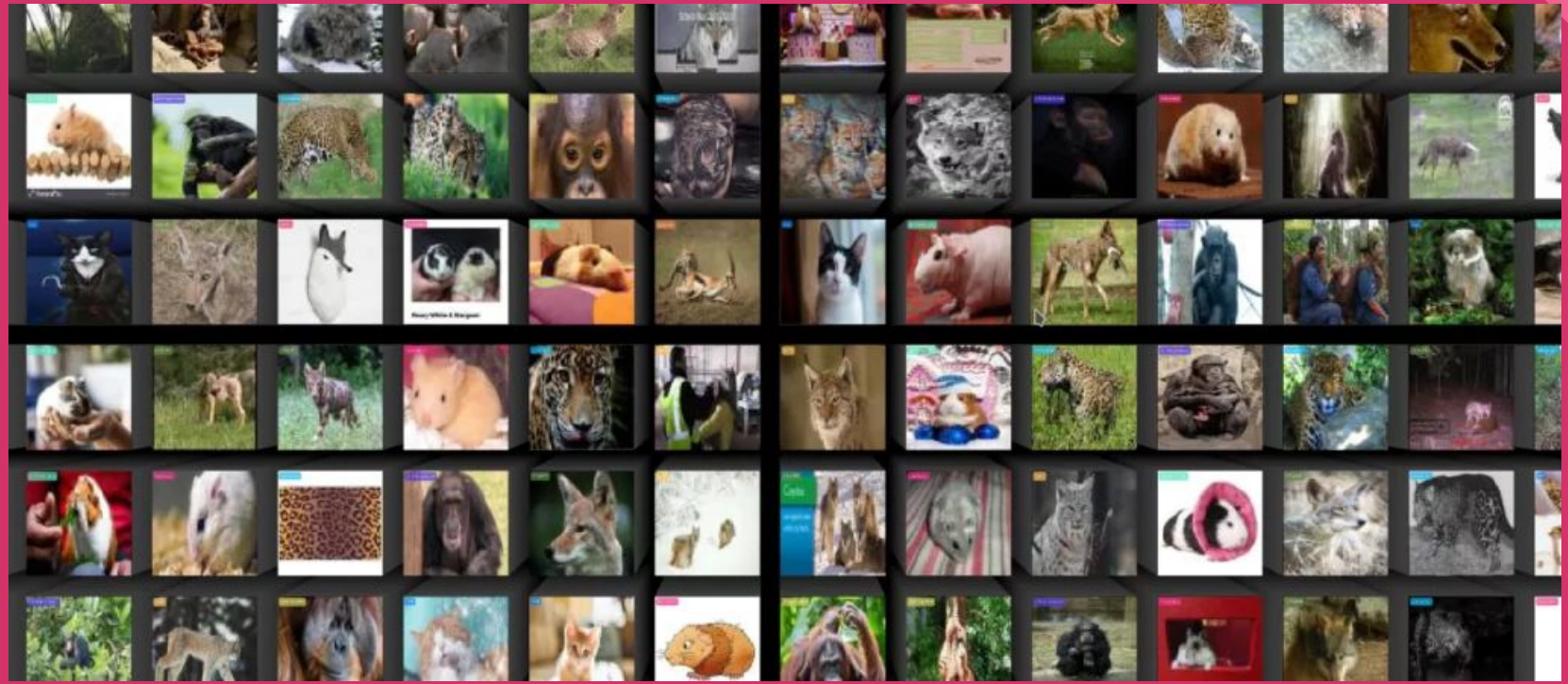
Soma - An unidentified plant the juice of which was a fundamental offering of the Vedic sacrifices.

Minpō - Civil Code of Japan (Japanese Constitution).

# Advocaat

Solution : Semantic Transfer

- Beverage , yellow in color , refrigerated.



Fact : There are 1,899,587 described species in the world !

# What is Zero Shot Learning ?

Zero-shot learning (ZSL) is a model's ability to detect classes never seen during training.

# Motivation for ZSL

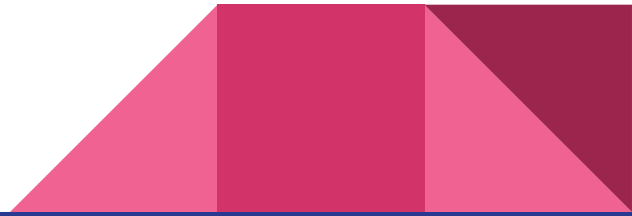
Creation of Models with minimal or no data.
Cross-Domain Adaptation
Human-Like Learning
Real-World Relevance
Expanding AI Applications

# Key Idea

ZSL leverages auxiliary information, such as semantic embeddings or attributes, to transfer knowledge from seen categories to unseen categories.

# Outline of the Seminar

- Zero Shot Learning in NLP
- Zero Shot Learning in CVPR



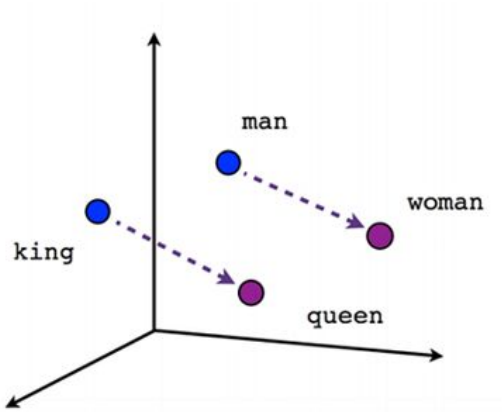
# Caution !!!

Zero shot learning is not the same as few shot learning.

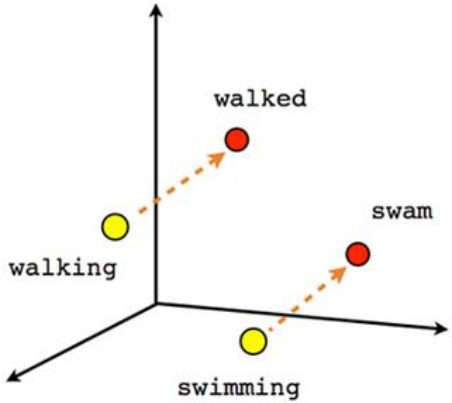
# Zero Shot Learning in NLP

# ZSL in NLP

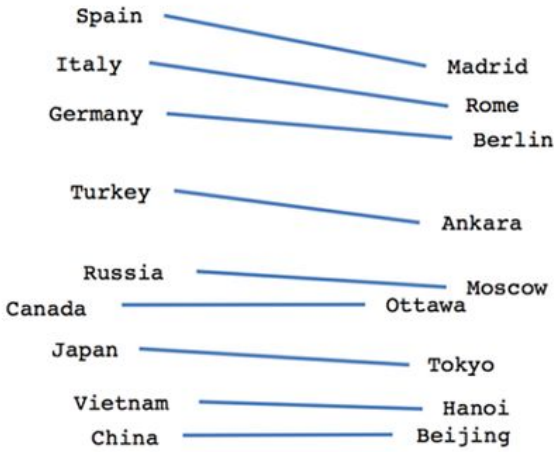
## Semantic Embeddings in NLP




Male-Female

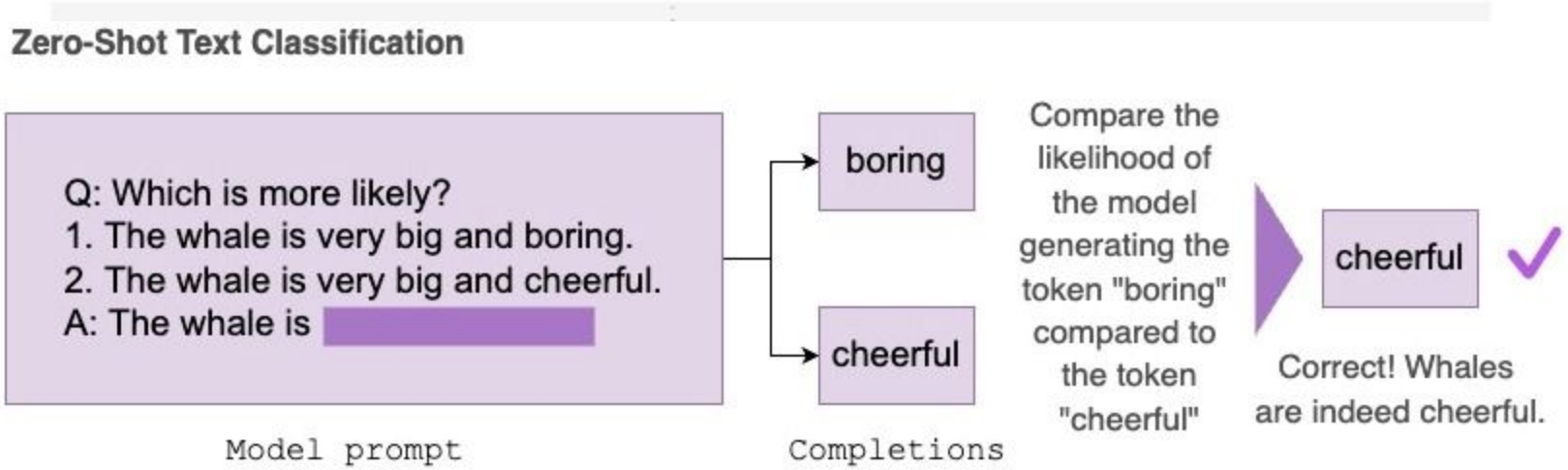



Verb tense




Country-Capital

# Zero Shot text classification



# Making use of transformers for ZERO SHOT TEXT CLASSIFICATION

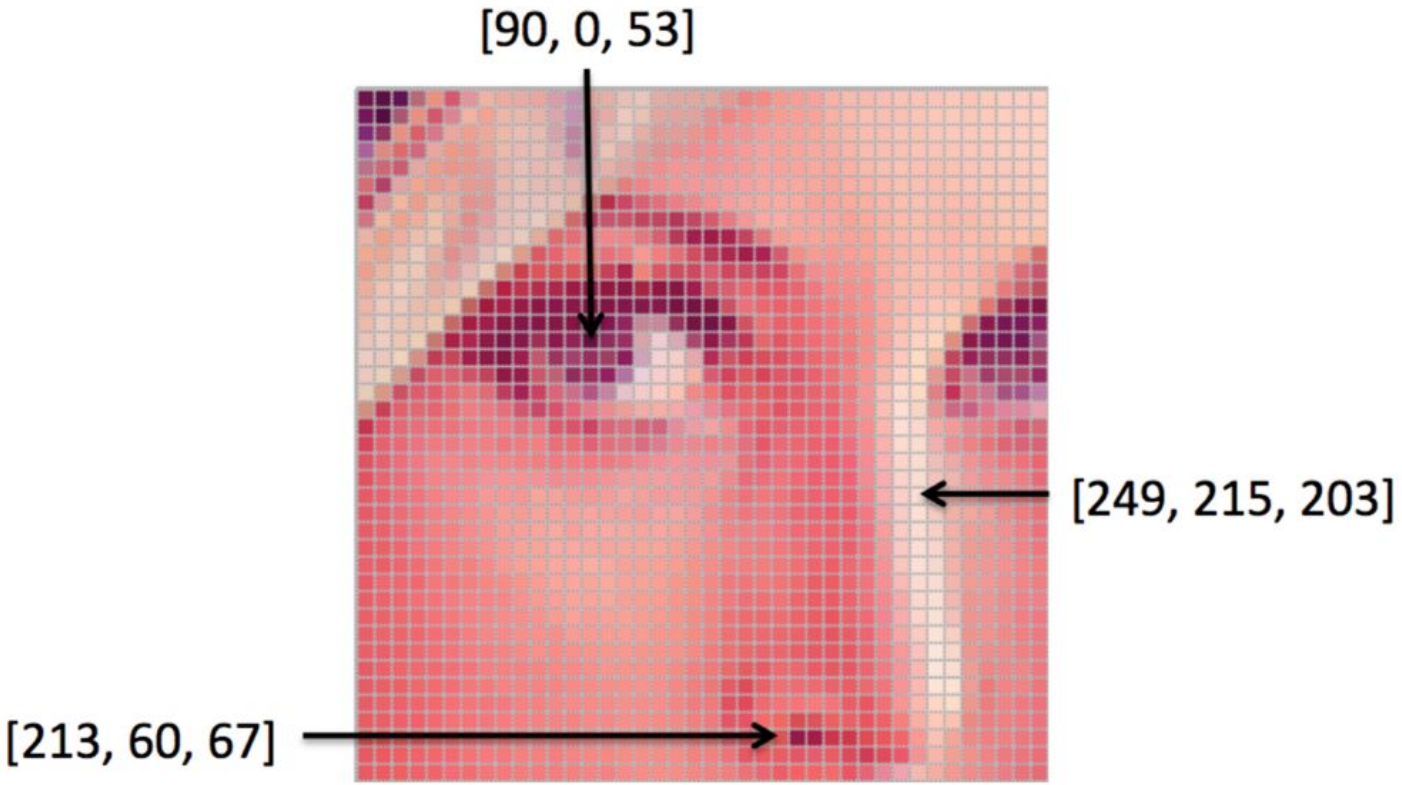
Will be continued in the linked Jupyter notebook

# Applications of zero shot text classification

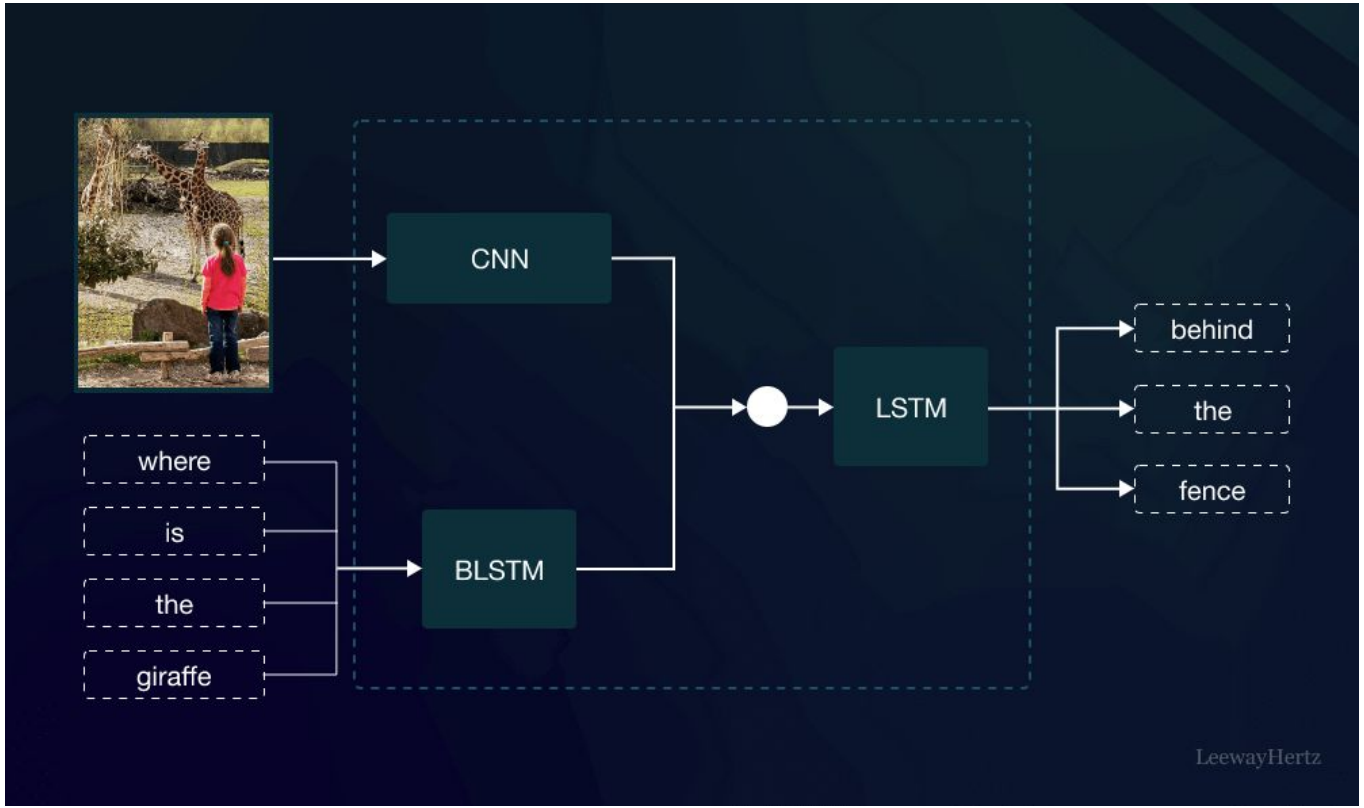
- Sentiment Analysis
- Spam Detection

# Zero Shot Learning IN CVPR

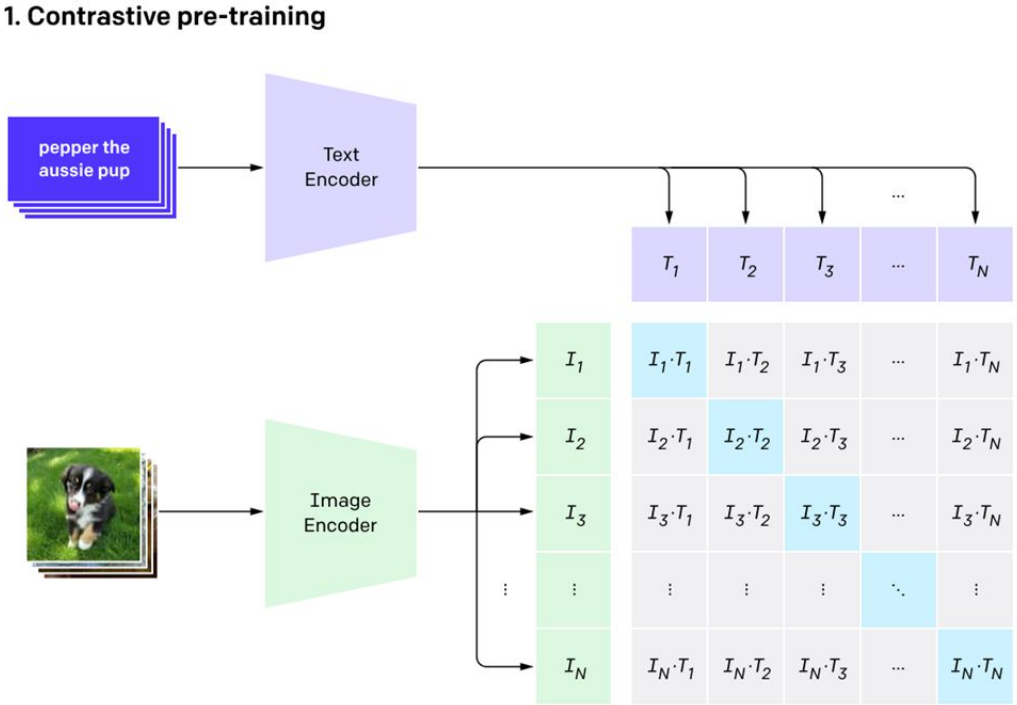
# Image representation



# Multimodal Models

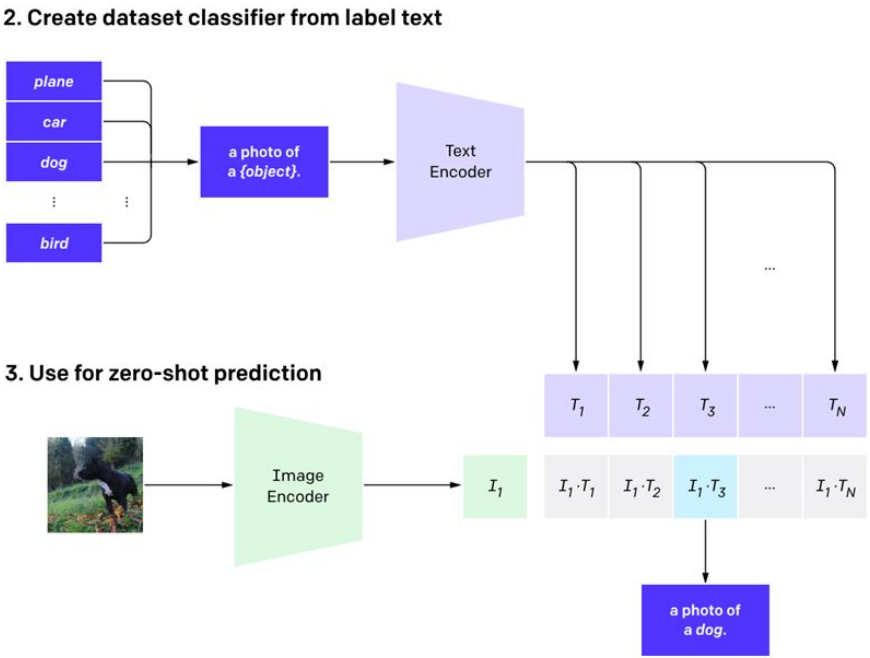


# CLIP — An Overview



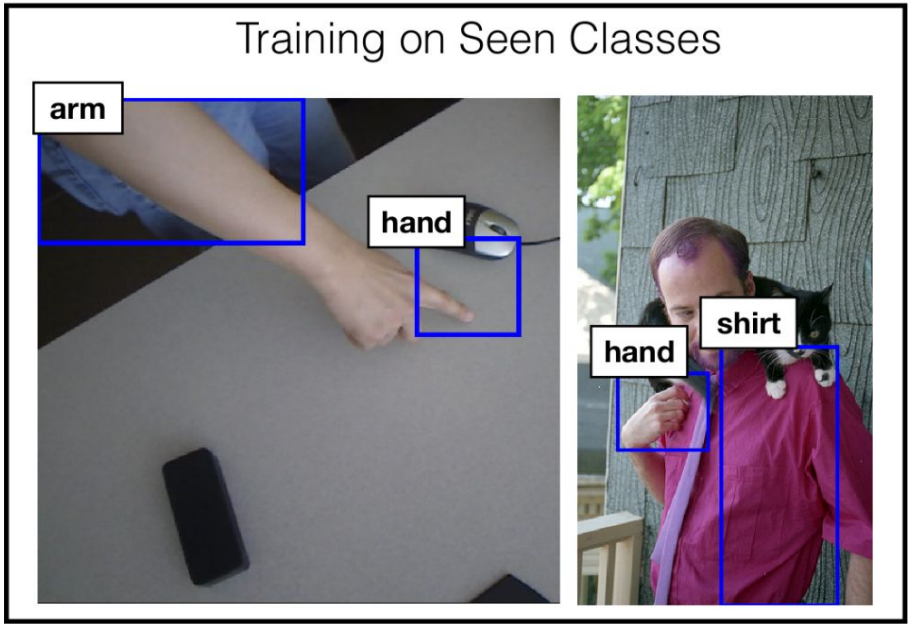

CLIP stands for Constastive Language-Image Pretraining
Source : OpenAI

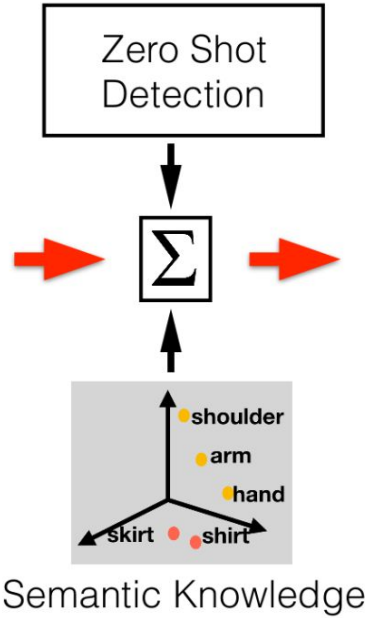
# CLIP — An Overview

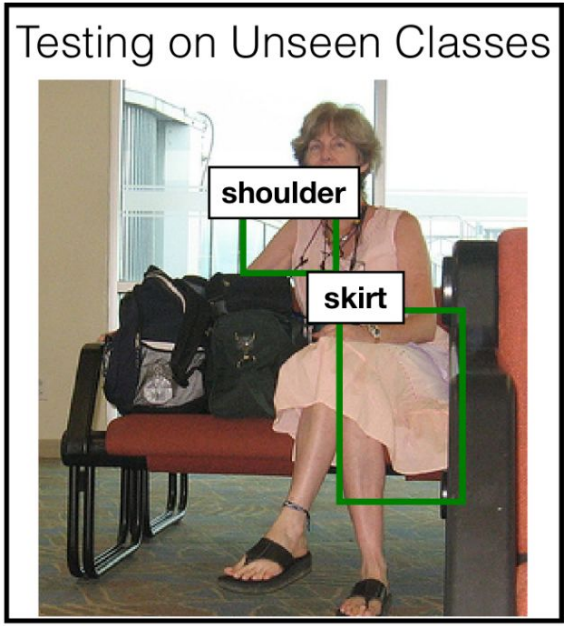



CLIP stands for Contrastive Language-Image Pretraining
Source : OpenAI

# Zero Shot Learning in CVPR



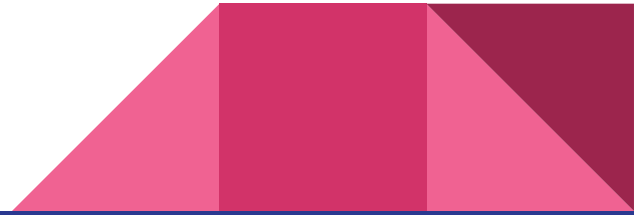

Zero Shot Object Detection

# Zero Shot Learning in CVPR

Zero Shot Segmentation
Source : Meta (Previously Facebook) SAM (Segment Anything Model)

# Usage of ZSL for image classification,object detection & image segmentation

Will be continued in the linked Jupyter notebook



# Challenges of Zero Shot Learning

Bias

Domain shift

Hubness

Semantic loss

# Future Directions

Zero Shot learning is becoming more prominent in the field of Audio Processing and Synthesis

Zero Shot object detection and segmentation is quite scalable

ZSL based text models can help reduce the size of current language models, making them more efficient.

# Thank You

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