KG & ZSL

MultiModal

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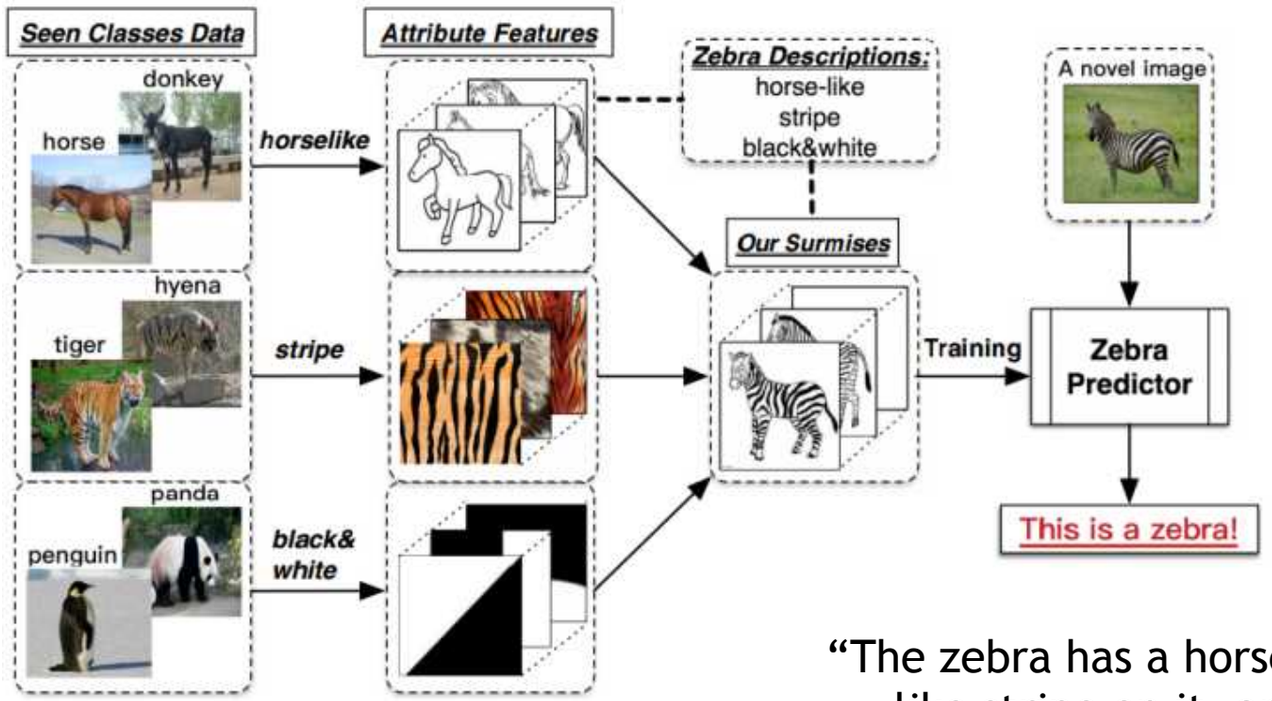
Introduction for ZSL

- Typical Application in image classification
  - seen classes: those have labeled training data
  - unseen classes: those without training data
  - key point: modeling the semantic relationship between seen and unseen classes, based on which the features of seen classes can be transferred to unseen classes



"The zebra has a horse's outline, and there is a tiger-like stripe on it, and it is black and white like a panda."

Introduction for ZSL

- Typical Class Semantics

Attribute:
large eye, long face,
hairy tail, solid color

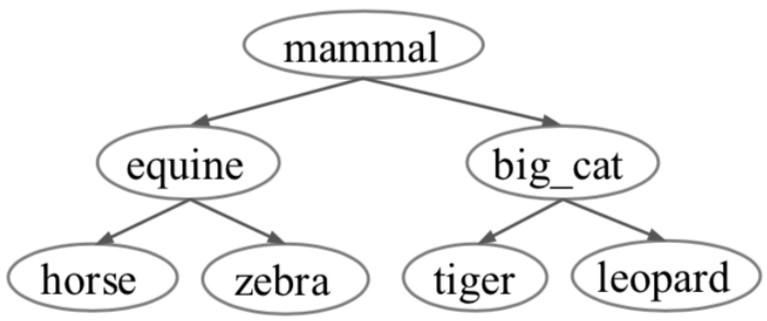
Text Description: Horse is an ungulate mammal. A horse's hearing is good, it has large ear and can rotate up to 180° …

Attribute:
large eye, long face,
hairy tail, stripe

Text Description: Zebras are white animals with black stripes, they have larger, rounder ears than horses …

Attribute:
long tail, round ear,
white belly, stripe

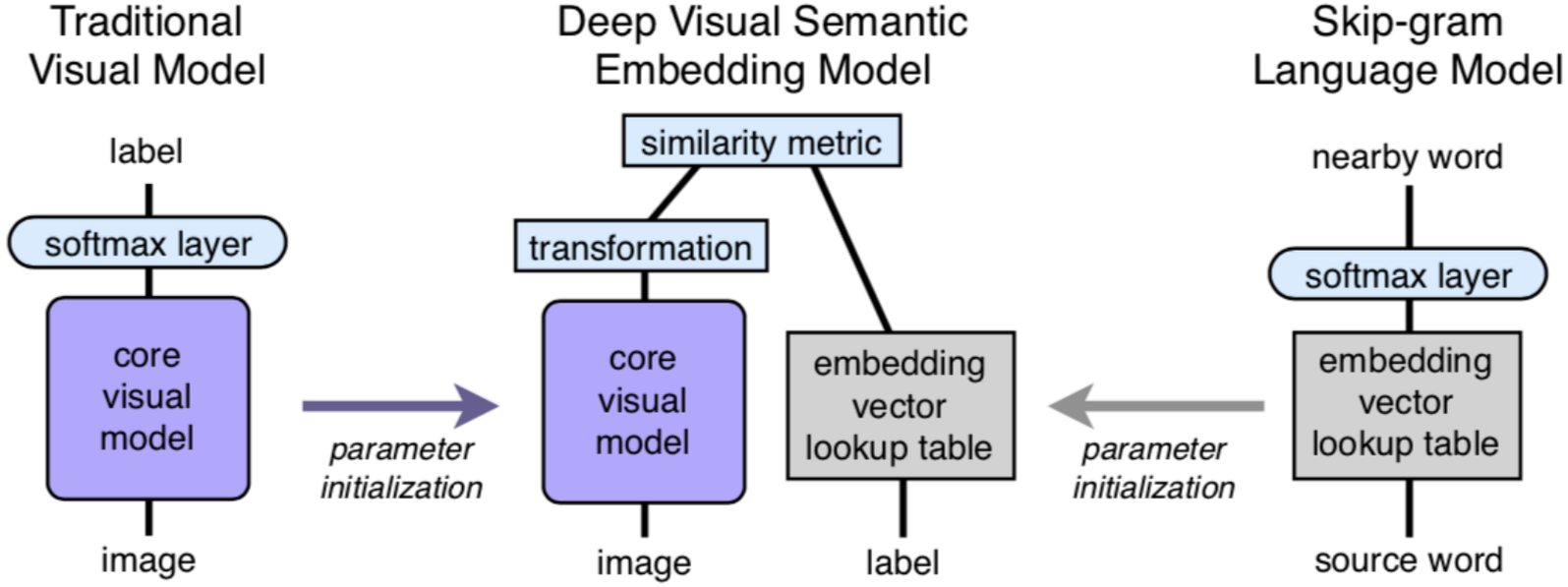
Text Description: Tiger is the largest specie among Felidae, it has dark vertical stripes on brown fur …



Taxonomy Structure

Introduction for ZSL

- Typical Method
  - a mapping function between semantic space and visual space
  - Semantic => Visual
  - Visual => Semantic
  - Semantic, Visual => Common Space



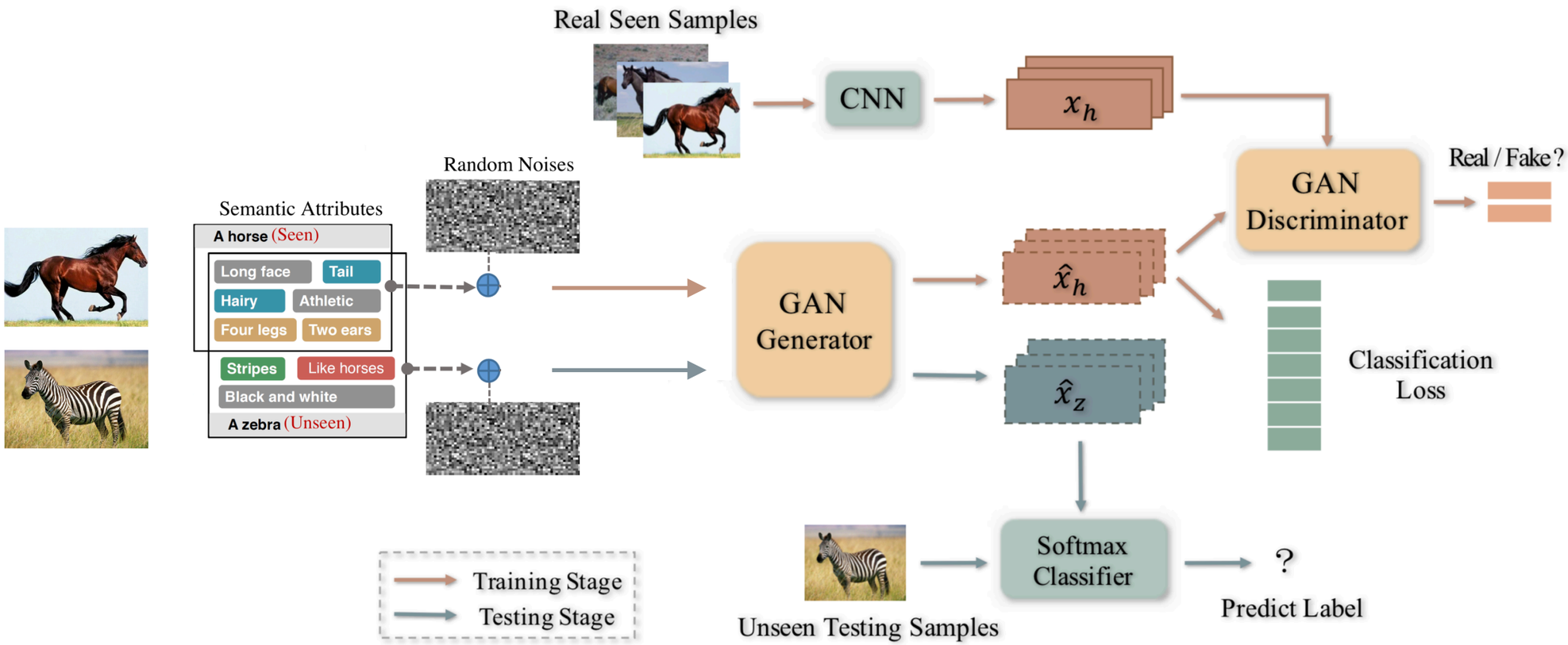
Generative Zero-shot Learning

Paper List

- List 1
  - <CVPR2019> Leveraging the Invariant Side of Generative Zero-Shot Learning
- List 2
  - <CVPR2018> Zero-shot Recognition via Semantic Embeddings and Knowledge Graphs
  - <CVPR2019> Rethinking Knowledge Graph Propagation for Zero-Shot Learning
- List 3
  - <AAAI2020> Generative Adversarial Zero-Shot Relational Learning for Knowledge Graphs

Generative Zero-shot Learning

Generative ZSL

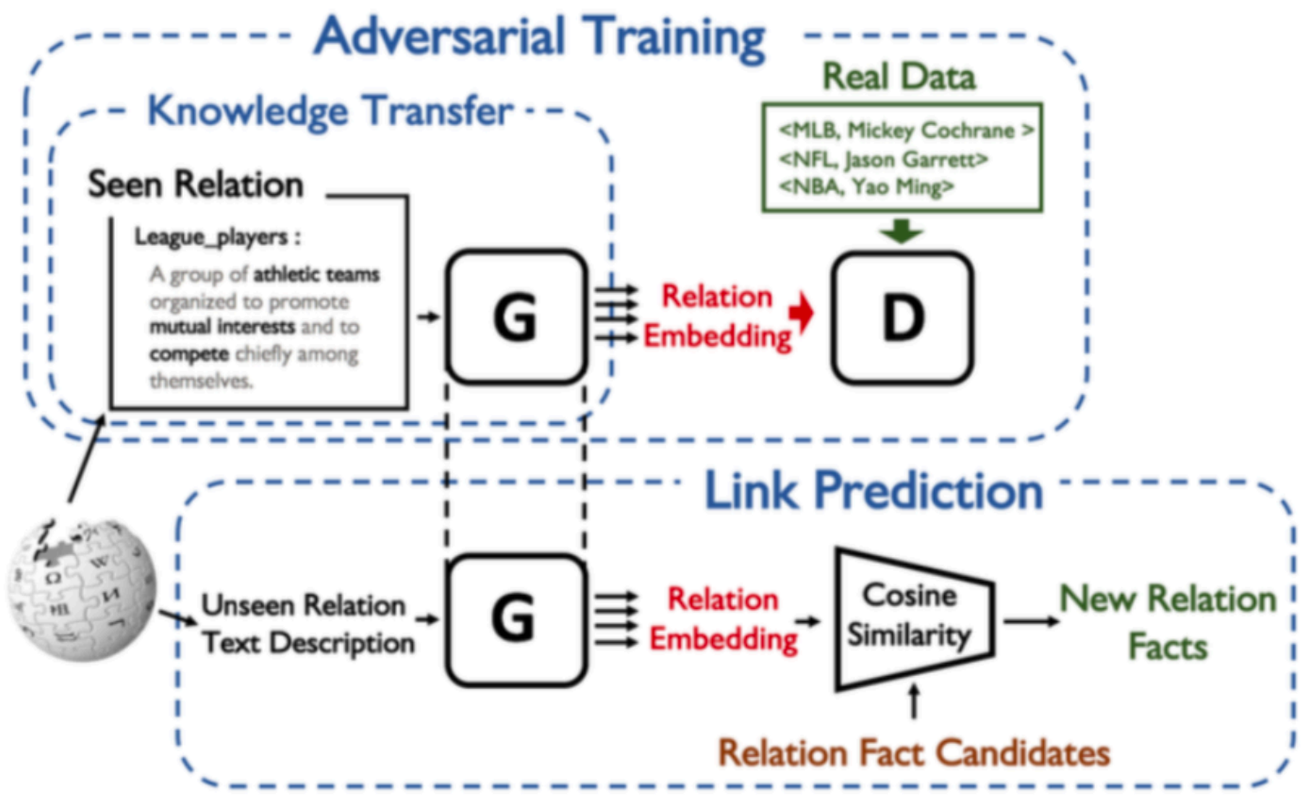


- Key Points
  - the input class semantics contain the relationship between seen and unseen classes
  - the quality of generated samples, whose distribution should be similar to the distribution of real samples

Jingjing Li, Mengmeng Jin, Ke Lu, Zhengming Ding, Lei Zhu, Zi Huang. Leveraging the Invariant Side of Generative Zero-Shot Learning. CVPR 2019.

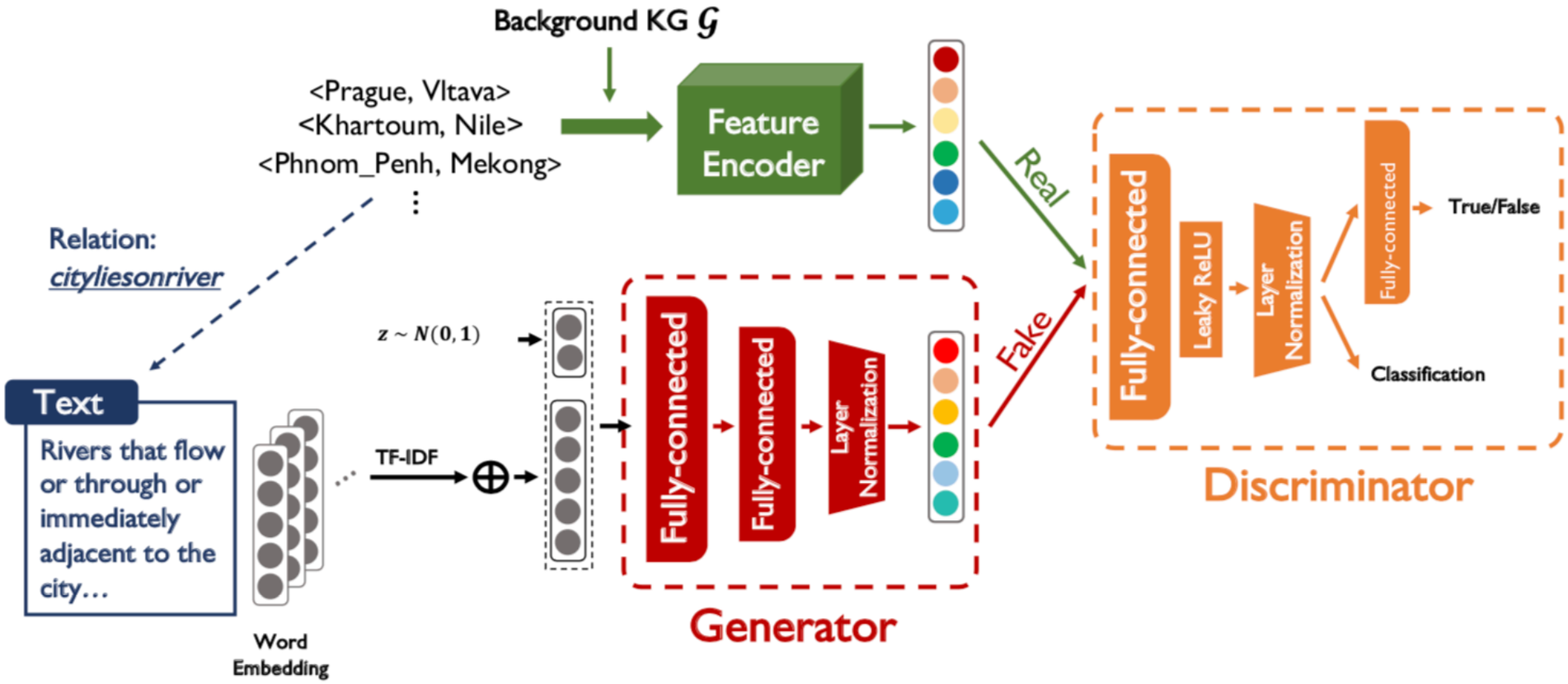
Generative ZSL in KG Embedding

- Problem Statement & Motivation
  - Newly-added Relations: unseen relations with no examples being seen
  - exploiting their text descriptions to generate relation embeddings, with GAN-based model



Pengda Qin, Xin Wang, Wenhu Chen, Chunyun Zhang, Weiran Xu, William Yang Wang.Generative Adversarial Zero-Shot Relational Learning for Knowledge Graphs. AAAI 2020.

Generative ZSL in KG Embedding



Pengda Qin, Xin Wang, Wenhu Chen, Chunyun Zhang, Weiran Xu, William Yang Wang.Generative Adversarial Zero-Shot Relational Learning for Knowledge Graphs. AAAI 2020.

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