Approaches to Solve Different Types of Computer Vision Problems

Image Classification

Image Classification

CAT

DOG

- Read the image as numpy array

Image Classification

CAT

DOG

- Read the image as numpy array
- Build a Neural Network model

Image Classification

CAT

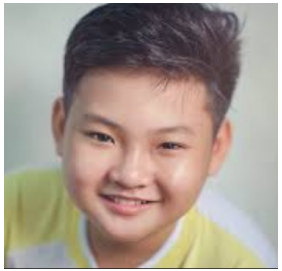
DOG

- Read the image as numpy array
- Build a Neural Network model
- Apply Sigmoid/Softmax Activation at the last layer

Image Regression

Image Regression

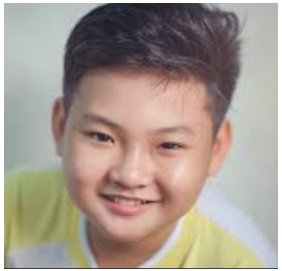
Age:
26



Age:
12

Image Regression

Age: 26

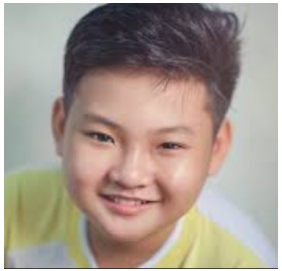


Age: 12

- Read the image as numpy array

Image Regression

Age: 26

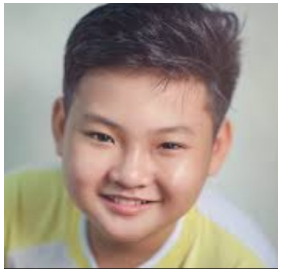


Age: 12

- Read the image as numpy array
- Build a Neural Network model

Image Regression

Age: 26

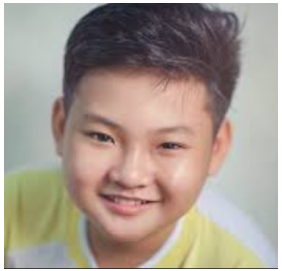


Age: 12

- Read the image as numpy array
- Build an MLP/CNN model
- Apply Sigmoid/Softmax Activation at the last layer

Regression Problem

Age: 26



Age: 12

- Read the image as numpy array
- Build an MLP/CNN model
- Apply **Linear Activation** at the last layer

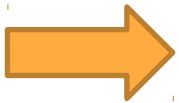
Object Detection

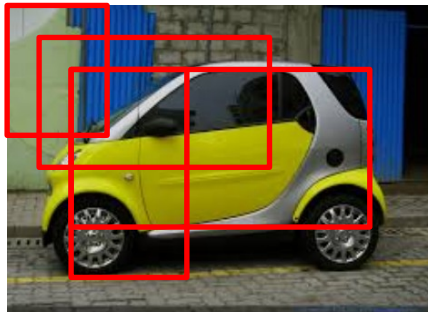
Objected Detection

Single
Object

Objected Detection

Single
Object

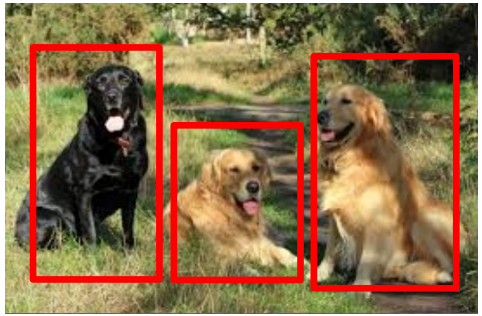




Objected Detection

Single Object

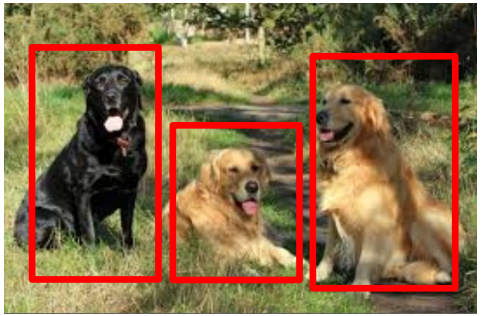
Multiple Objects – Same Class



Objected Detection

Single Object

Multiple Objects – Same Class



Multiple Objects – Multiple Class

Action Recognition

Action Recognition

Input

Female

Running

Image Captioning

Image Captioning

A kid is laughing

A group of boys playing football

A female athlete is running

- Action Recognition Extension

Image Captioning

A kid is laughing

A female athlete is running

A group of boys playing football

- Action Recognition Extension
- Action + Textual description

Image Captioning

A kid is laughing

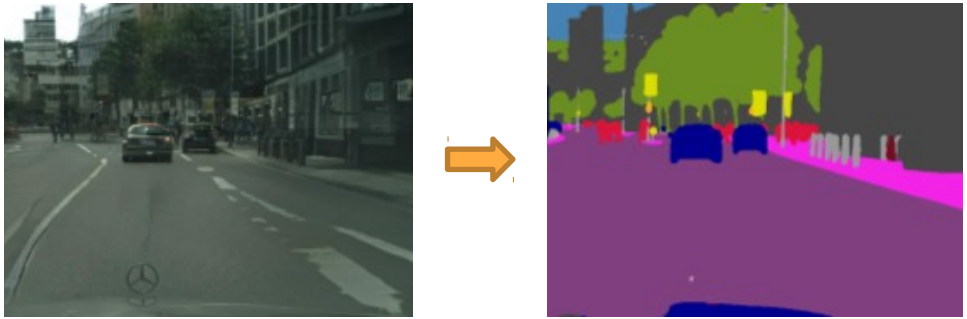
A female athlete is running

A group of boys playing football

- Action Recognition Extension
- Action + Textual description
- Computer Vision + NLP

Image Segmentation

Image Segmentation



- Pixel-level Classification

Image Segmentation

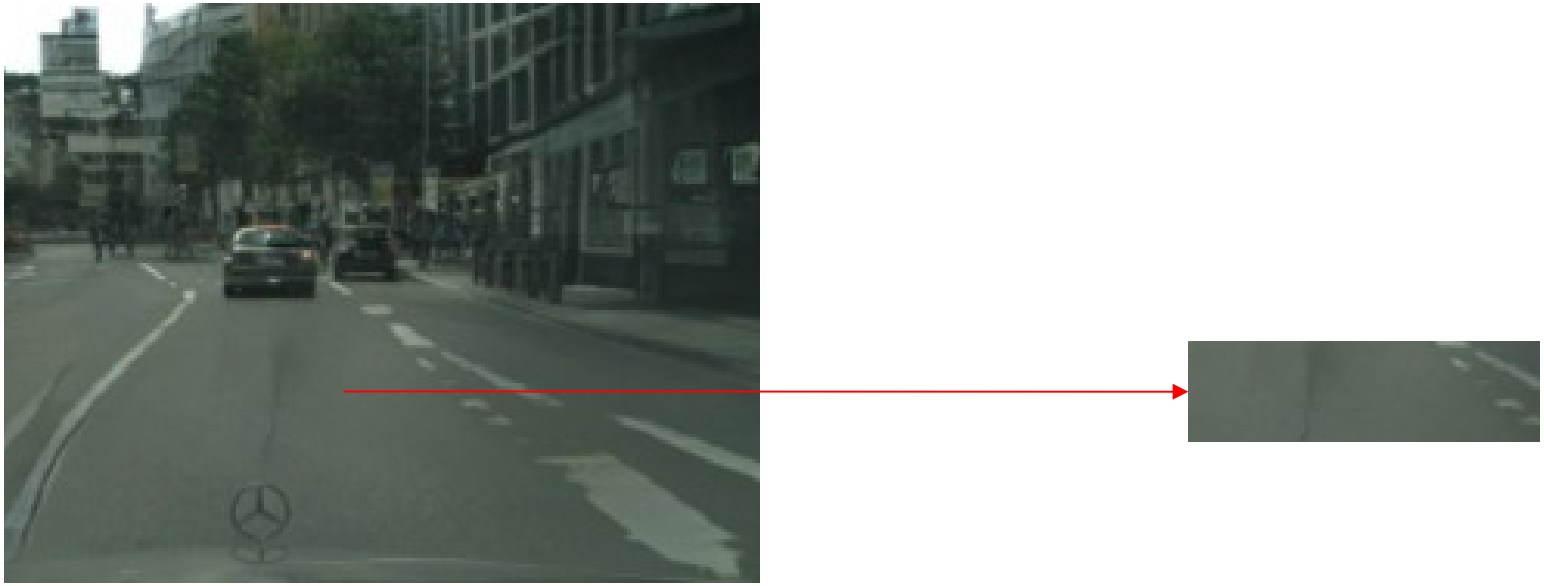


Image Segmentation

Summary

Problem	Classification	Regression
Classification	✔	✖
Regression	✖	✔
Object Detection	✔	✔
Action Recognition	✔	✖
Image Captioning	✔	✖
Image Segmentation	✔	✔