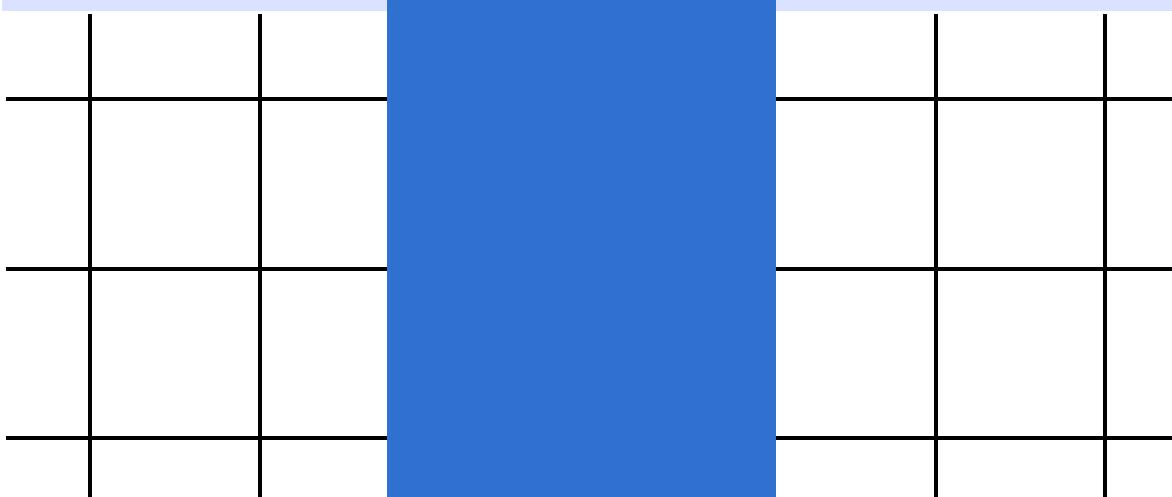


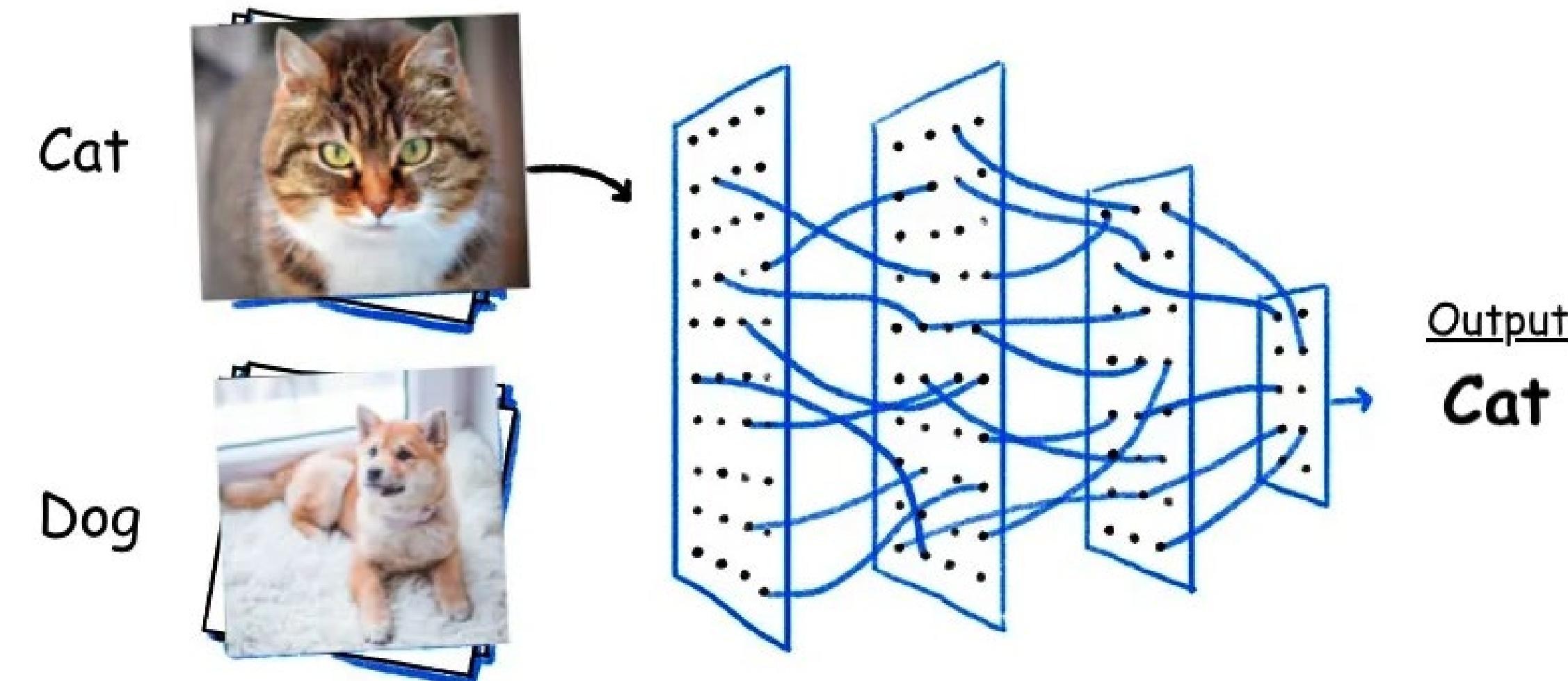
# **DATASET AND P R E P A R A T I O N**

**– Matee Vadrukchid –**



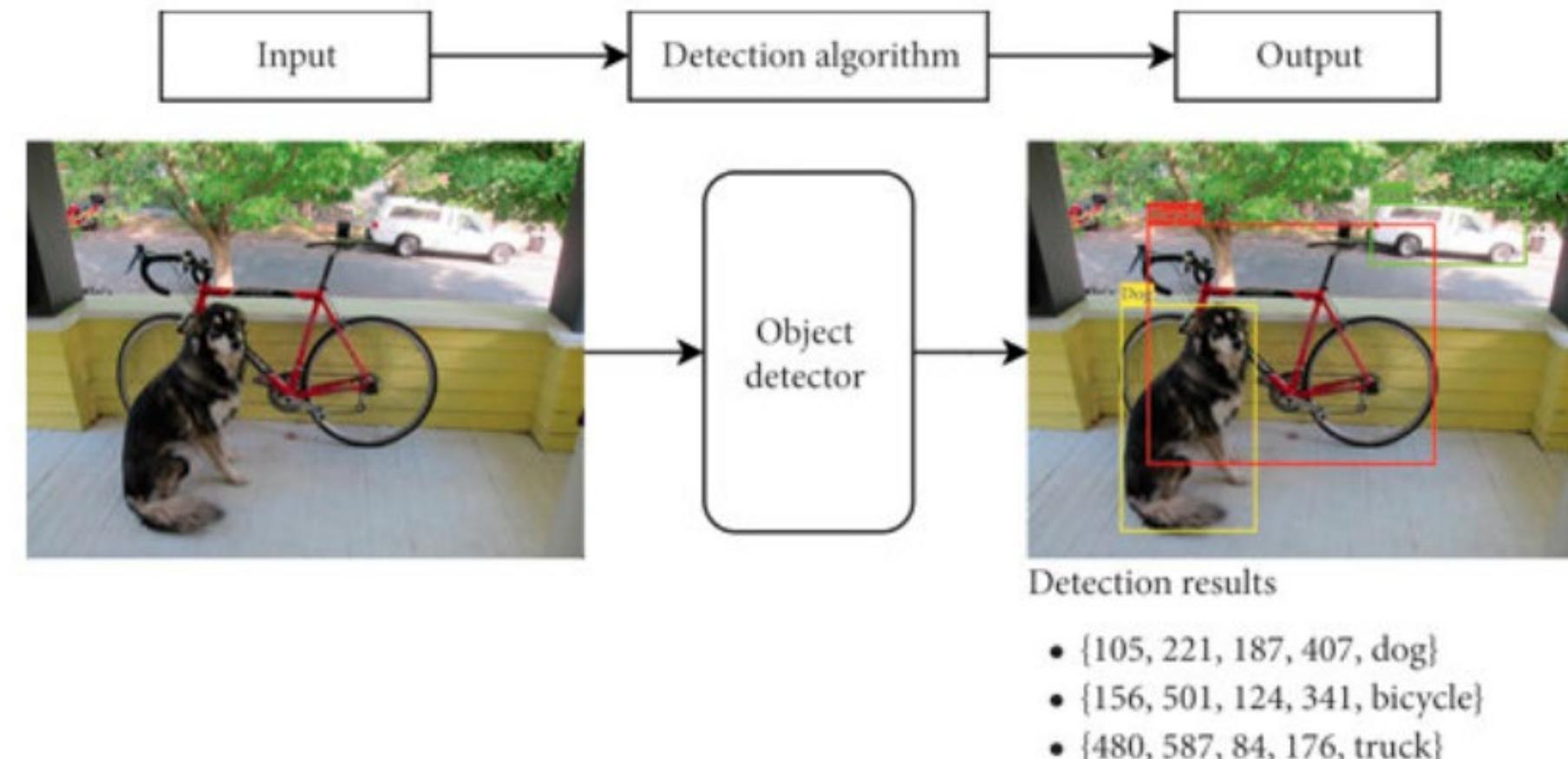
# INTRODUCTION

## Image Classification Model



# INTRODUCTION

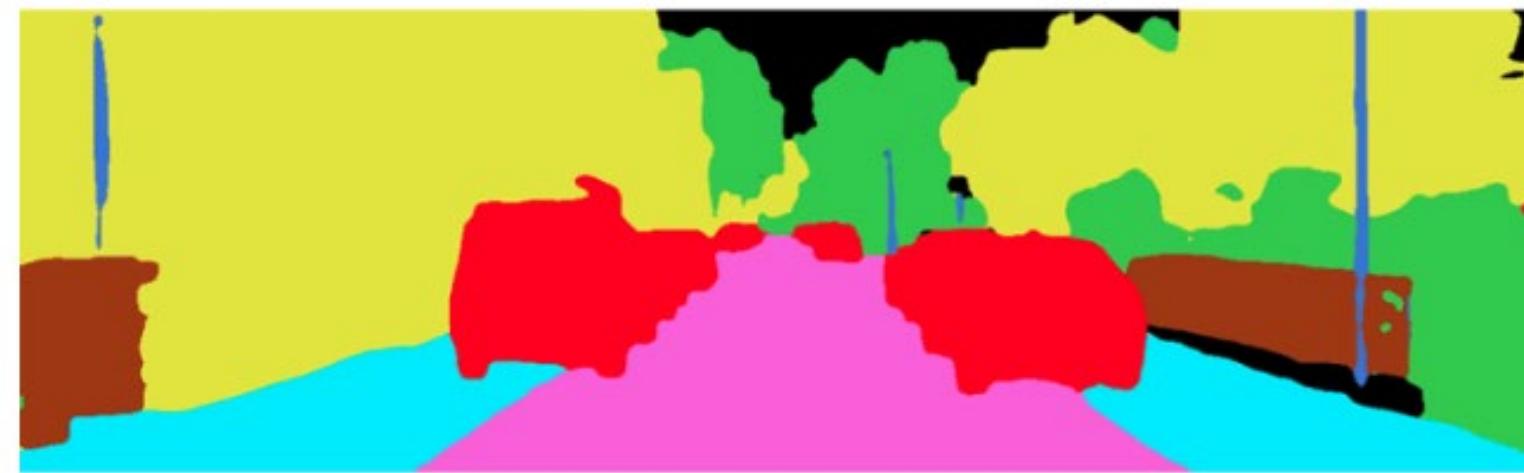
## Object detection Model



Link: [https://www.researchgate.net/figure/Object-detection-in-an-example-image\\_fig1\\_341596604](https://www.researchgate.net/figure/Object-detection-in-an-example-image_fig1_341596604)

# INTRODUCTION

## Semantic Segmentation Model



Road	Sidewalk	Building	Fence
Pole	Vegetation	Vehicle	Unlabel

[Link](https://towardsai.net/p/l/machine-learning-7) : <https://towardsai.net/p/l/machine-learning-7>

# INTRODUCTION

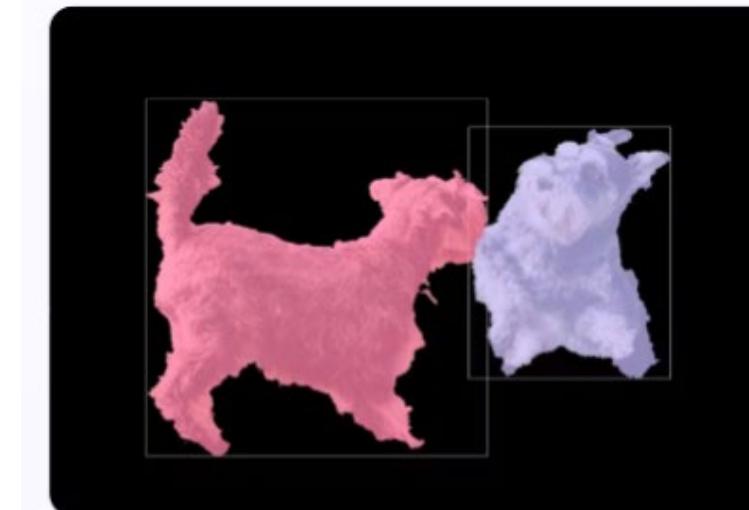
## Semantic Segmentation Model



(a) Image



(b) Semantic Segmentation



(c) Instance Segmentation



(d) Panoptic Segmentation

Link: <https://encord.com/blog/instance-segmentation-guide-computer-vision/>

# INTRODUCTION

## Convolutional

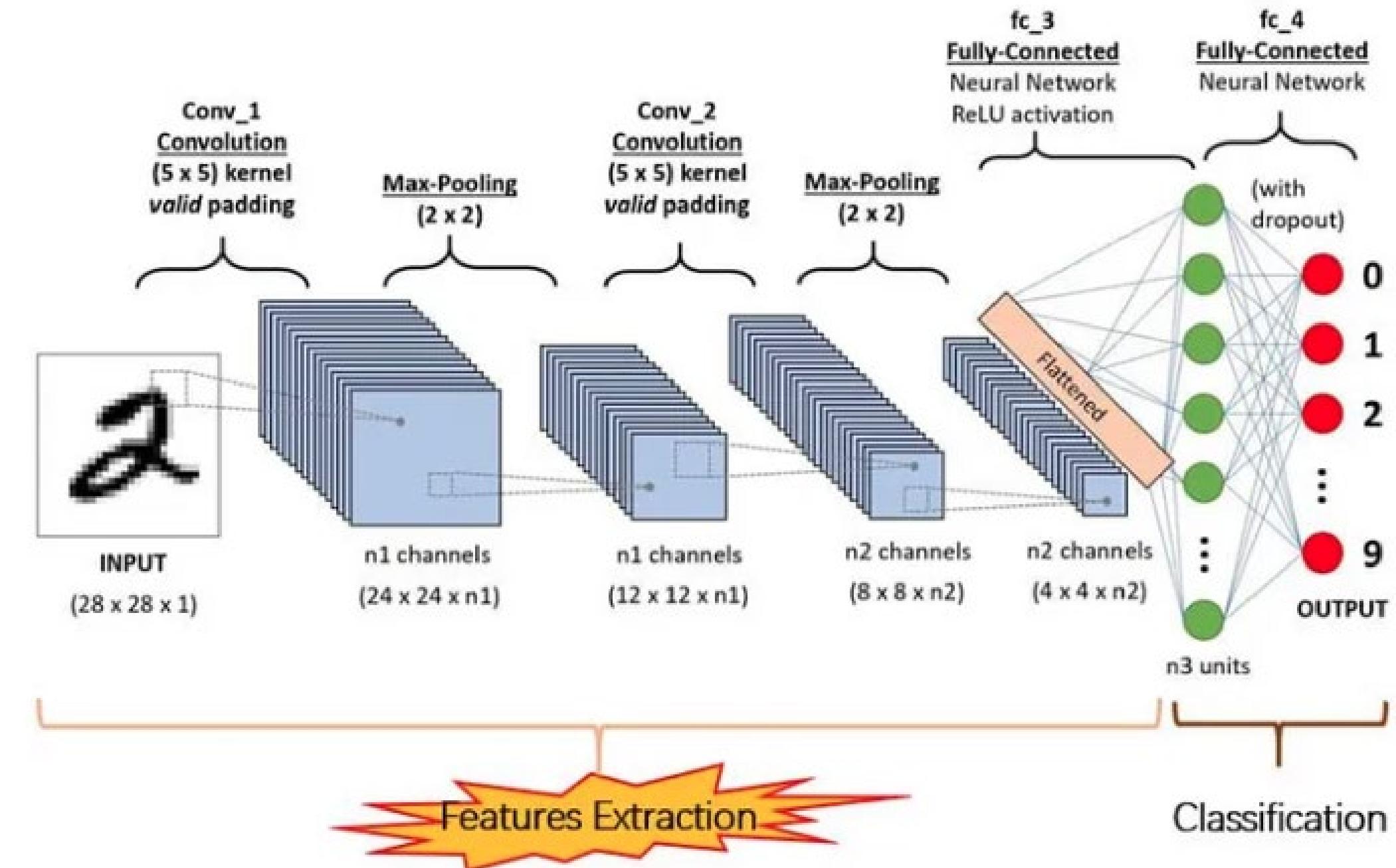


Image source: <https://paperswithcode.com/methods/category/convolutional-neural-networks>

# INTRODUCTION

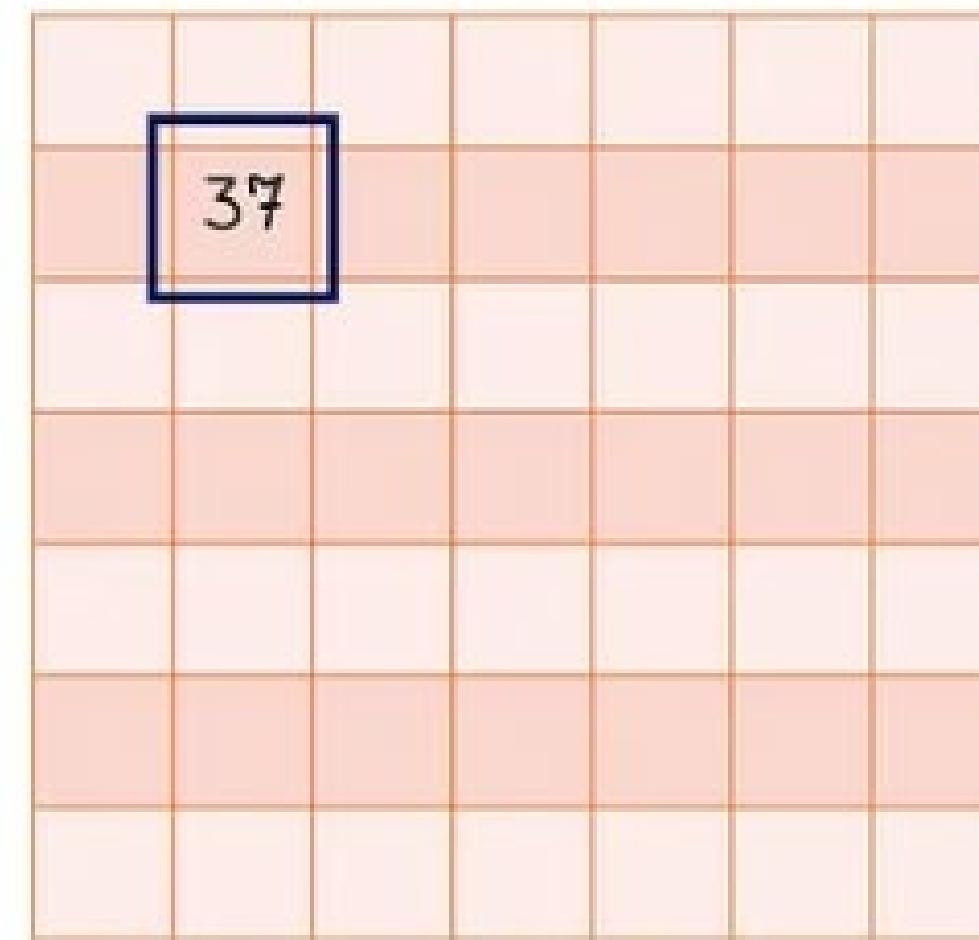
1	2	4	2	2	3	1
6	3	4	1	6	7	2
5	2	3	3	4	6	3
4	1	3	2	5	1	5
2	4	5	3	3	6	7
3	4	2	4	2	5	4
2	5	1	6	1	2	3

## input



1	2	1
1	2	1
1	2	1

## filter



## output

# INTRODUCTION

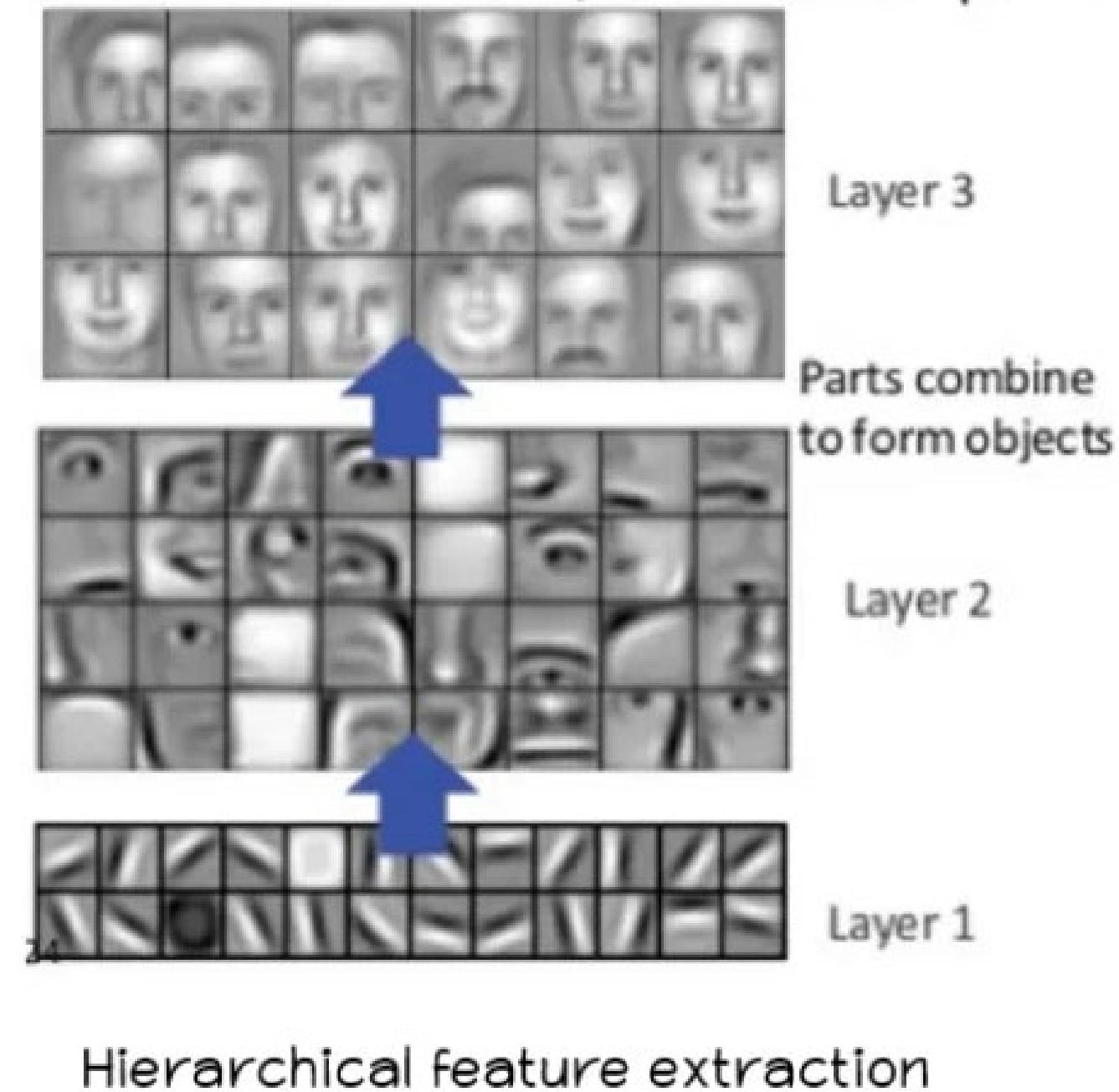


-1	-1	-1
-1	8	-1
-1	-1	-1



<https://www.cs.columbia.edu/education/courses/course/COMSW4995-7/26050/>

# INTRODUCTION



# INTRODUCTION

## Convolutional

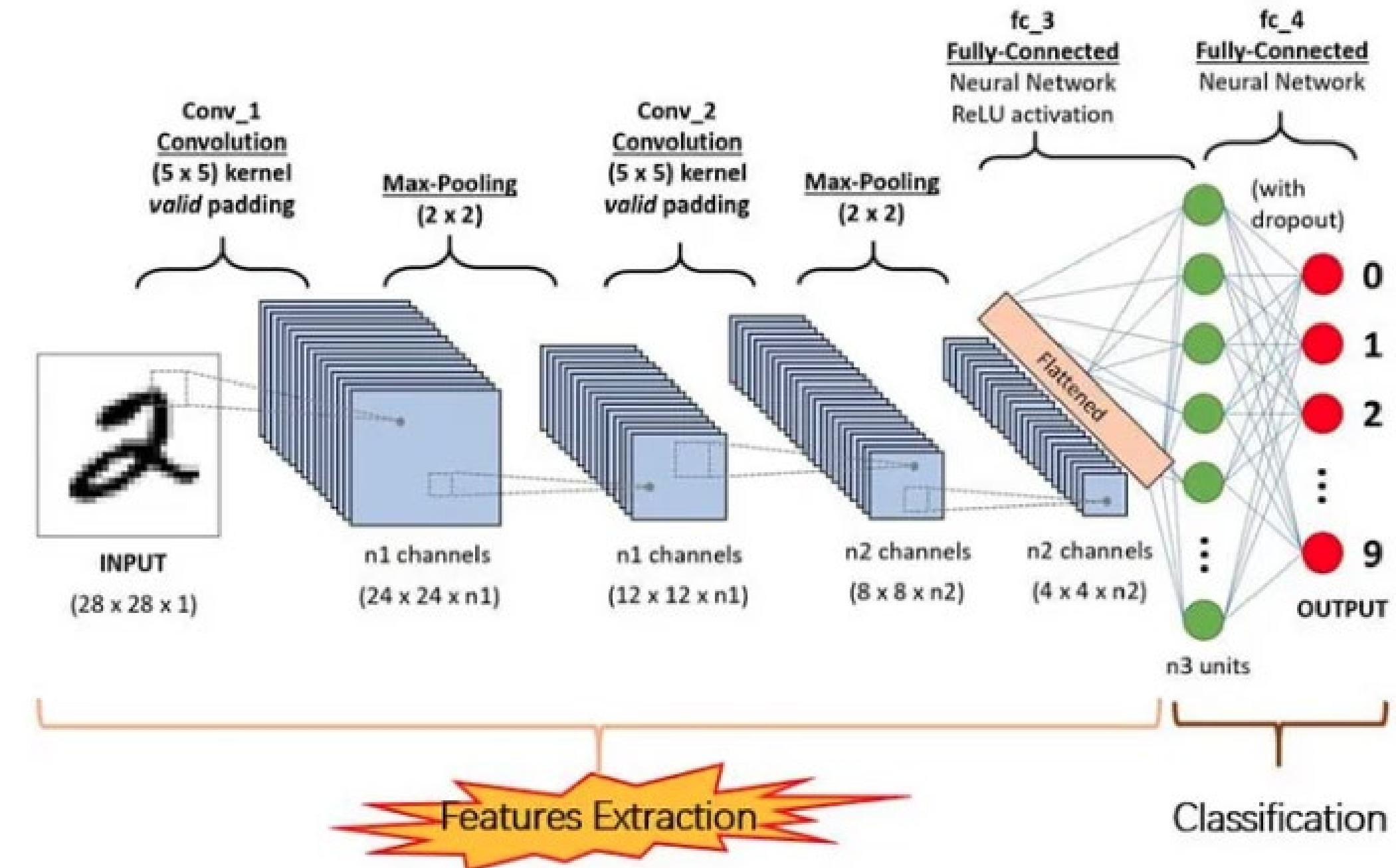


Image source: <https://paperswithcode.com/methods/category/convolutional-neural-networks>

# Part 1: Classification

# Part 1: Classification

```
dataset/
└── train/
    ├── cat/
    │   ├── cat1.jpg
    │   ├── cat2.jpg
    │   └── ...
    └── dog/
        ├── dog1.jpg
        ├── dog2.jpg
        └── ...
└── val/
    ├── cat/
    └── dog/
```

## Part 1: Classification

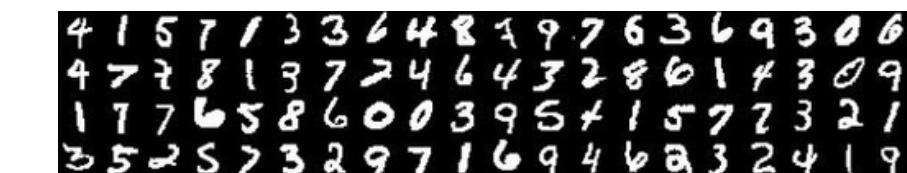
### Datasets

- MNIST
- CIFAR-10
- SMILES
- Kaggle:Dogs vs. Cats

## Part 1: Classification

### MNIST

- Stands for modified National Institute of Standards and Technology released in 2004 The goal of this
  - dataset is to correctly classify the handwritten digits 0-9 (28x28 pixels)
- It is like “Hello, World” in machine learning
- It consists of 60,000 training images and 10,000 testing images. Pixel intensities are in the range [0,255]



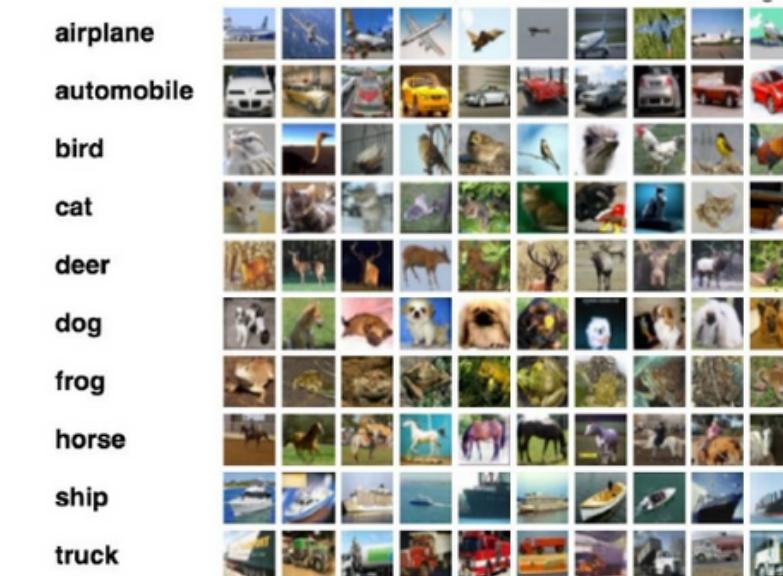
A 4x7 grid of handwritten digits from the MNIST dataset. The digits are arranged in four rows and seven columns. The digits are black on a white background and vary slightly in style and size.

4	1	5	7	1	3	3	6	4	8	1	9	7	6	3	6	9	3	0	6
4	7	7	8	1	3	7	2	4	6	4	3	2	8	6	1	4	3	0	9
1	1	7	6	5	8	6	0	0	3	9	5	4	1	5	7	2	3	2	1
3	5	2	5	7	3	2	9	7	1	6	9	4	6	8	3	2	4	1	9

## Part 1: Classification

### CIFAR-10

- It is considered another standard benchmark data for image classification (released in 2009)
- CIFAR-10 consists of 60,000 of 32x32x3 (RGB) (= 3072 features) images
- CIFAR-10 consists of 10 classes including airplanes, automobiles, birds, cats, deer, dogs, frogs, horses, ships, and trucks



## Part 1: Classification

### SMILES

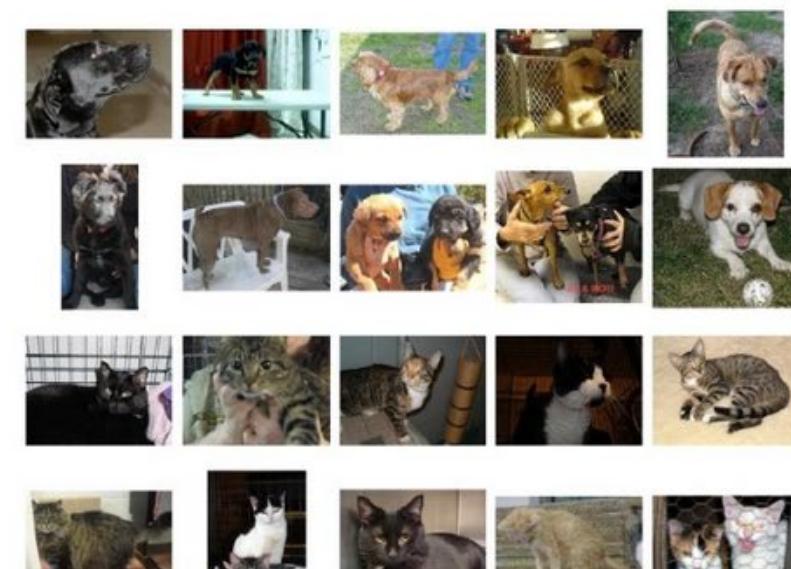
- The SMILES dataset (smiling or not smiling) consists of 13,165 grayscale images with the size of 64x64.
- The early days of machine learning is using only cropped data with minimum background



## Part 1: Classification

### Kaggle: Dogs vs. cats

- Dogs vs. Cats challenge is part of a Kaggle competition for machine learning algorithms
- The dataset is provided in 2013 from Kaggle company
- A total of 25,000 RGB images are provided



## Part 1: Classification

### Datasets

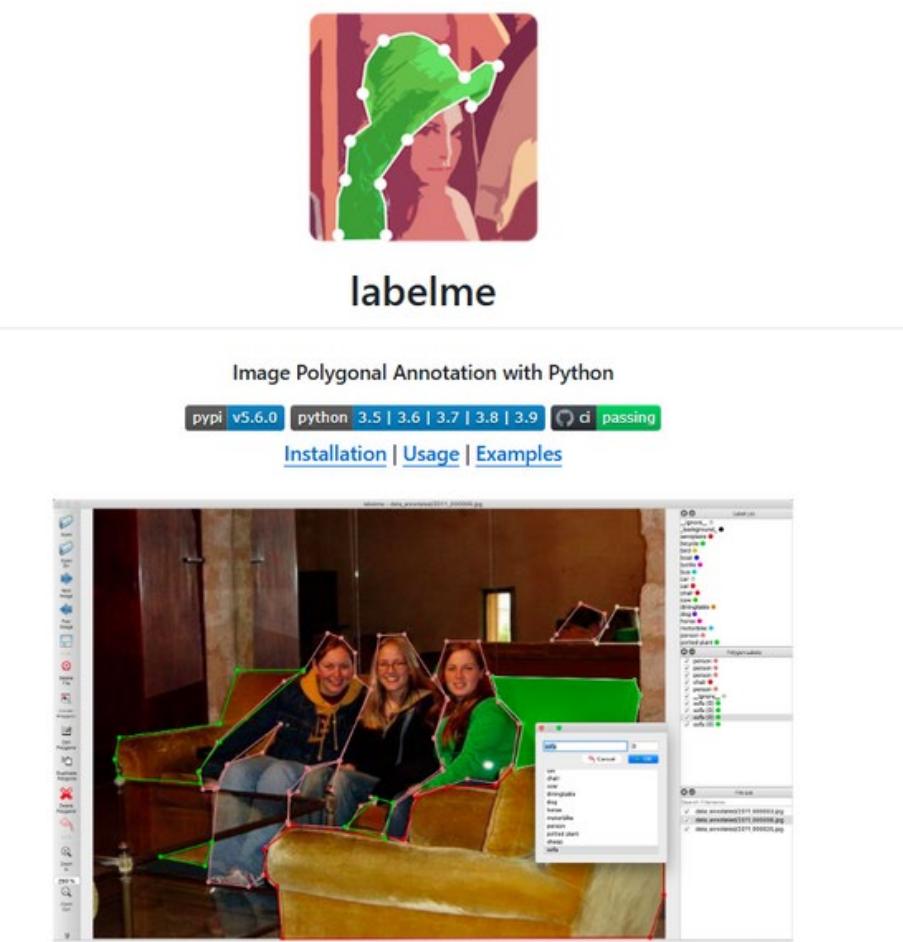
- Flowers-17
- CALTECH-101
- Adience
- ImageNet
- Kaggle: Facial Expression Recognition Challenge

## Part 2: Object Detection

## Part 2: Object detection

Labelme

Link: <https://github.com/wkentaro/labelme>



## Part 2: Object detection

### Labelme2YOLO

Link: <https://github.com/GreatV/labelme2yolo>

#### Labelme2YOLO

[pypi v0.2.5](#) [downloads 4.4k/month](#) [downloads 94k](#)

Labelme2YOLO efficiently converts LabelMe's JSON format to the YOLOv5 dataset format. It also supports YOLOv5/YOLOv8 segmentation datasets, making it simple to convert existing LabelMe segmentation datasets to YOLO format.

#### New Features

- export data as yolo polygon annotation (for YOLOv5 & YOLOv8 segmentation)
- Now you can choose the output format of the label text. The two available alternatives are `polygon` and `bounding box( bbox )`.

#### Performance

Labelme2YOLO is implemented in Rust, which makes it significantly faster than equivalent Python implementations. In fact, it can be up to 100 times faster, allowing you to process large datasets more efficiently.

#### Installation

```
pip install labelme2yolo
```

