Kissipo Learning for Deep Learning

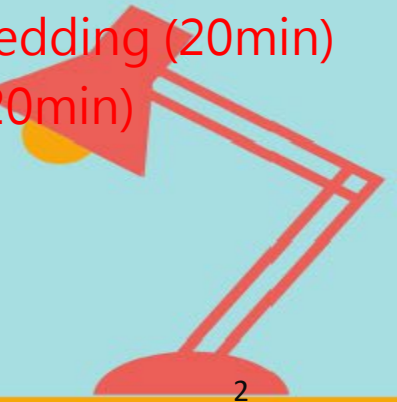
Topic 1: Introduction to Deep Learning Course

Hsueh-Ting Chu

KLDL-W1-01

Topics

- Topic 01: Introduction to Deep Learning (20min)
- Topic 02: Kissipo Learning for Deep Learning (20min)
- Topic 03: Python quick tutorial (20min)
- Topic 04: Numpy quick tutorial (15min)
- Topic 05: Pandas quick tutorial (15min)
- Topic 06: Scikit-learn quick tutorial (15min)
- Topic 07: OpenCV quick tutorial (15min)
- Topic 08: Image Processing basics (20min)
- Topic 09: Machine Learning basics (20min)
- Topic 10: Deep Learning basics (20min)
- Topic 11: TensorFlow overview (20min)
- Topic 12: CNN with TensorFlow (20min)
- Topic 13: RNN with TensorFlow (20min)
- Topic 14: PyTorch overview (20min)
- Topic 15: CNN with PyTorch (20min)
- Topic 16: RNN with Pytorch (20min)
- Topic 17: Introduction to AOI (20min)
- Topic 18: AOI simple Pipeline (A) (20min)
- Topic 19: AOI simple Pipeline (B) (20min)
- Topic 20: Introduction to Object detection (20min)
- Topic 21: YoloV5 Quick Tutorial (20min)
- Topic 22: Using YoloV5 for RSD (20min)
- Topic 23: Introduction to NLP (20min)
- Topic 24: Introduction to Word Embedding (20min)
- Topic 25: Name prediction project (20min)



Content

- Topic 1: Introduction to Deep Learning Course
  - Course schedule and grading policy
  - About deep learning
  - Deep learning programming framework

Course Schedule

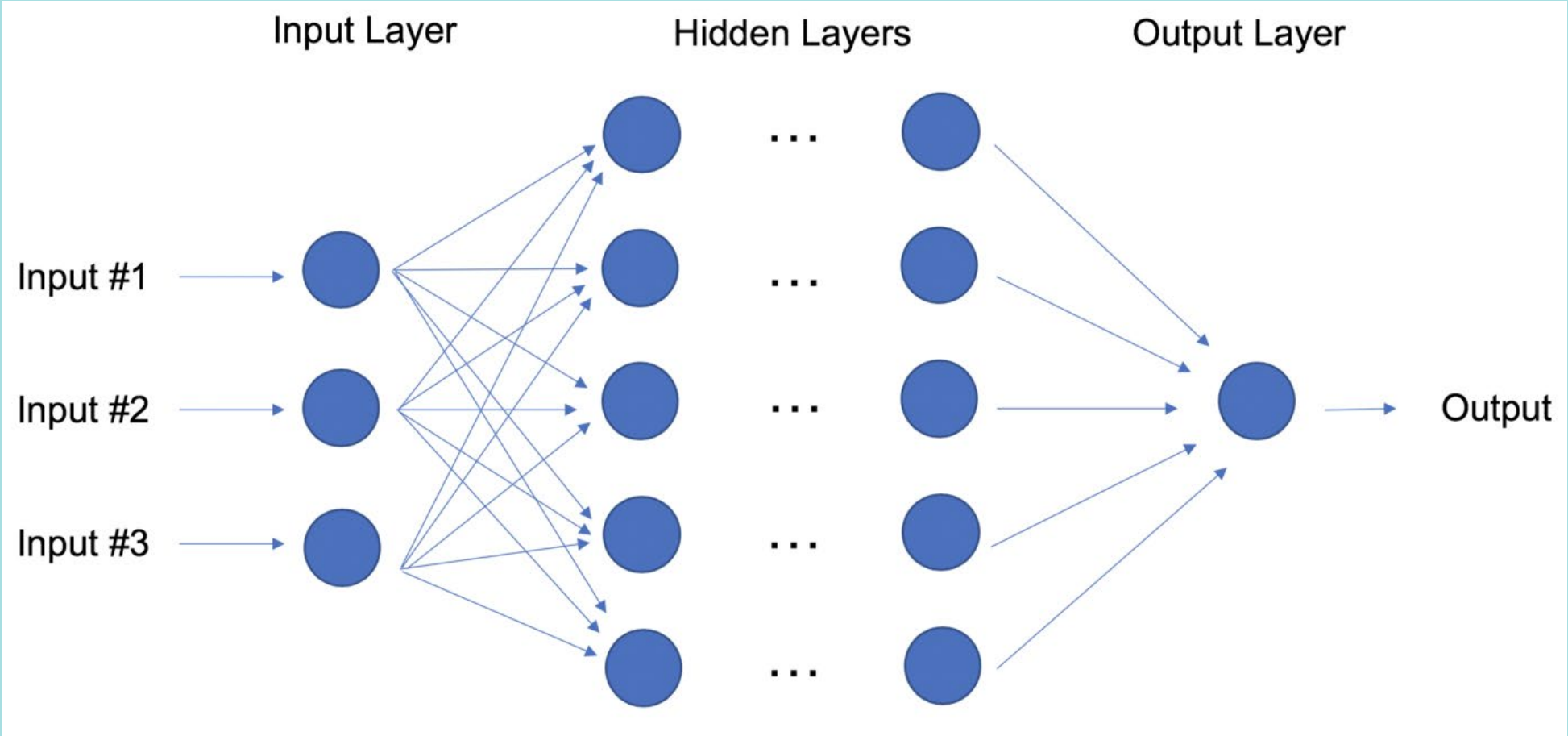
- W1 - Course Introduction
- W2 - DL Programming Basics(1)
- W3 - DL Programming Basics(2)
- W4 - DL with TensorFlow
- W5 - Midterm
- W6 - DL with PyTorch
- W7 - AOI hands-on project
- W8 - RSD hands-on project
- W9 - NLP hands-on project
- W10 - Final exam

DL: Deep Learning
AOI: Automated Optical Inspection
RSD: Road Sign Detection
NLP: Natural Language Processing

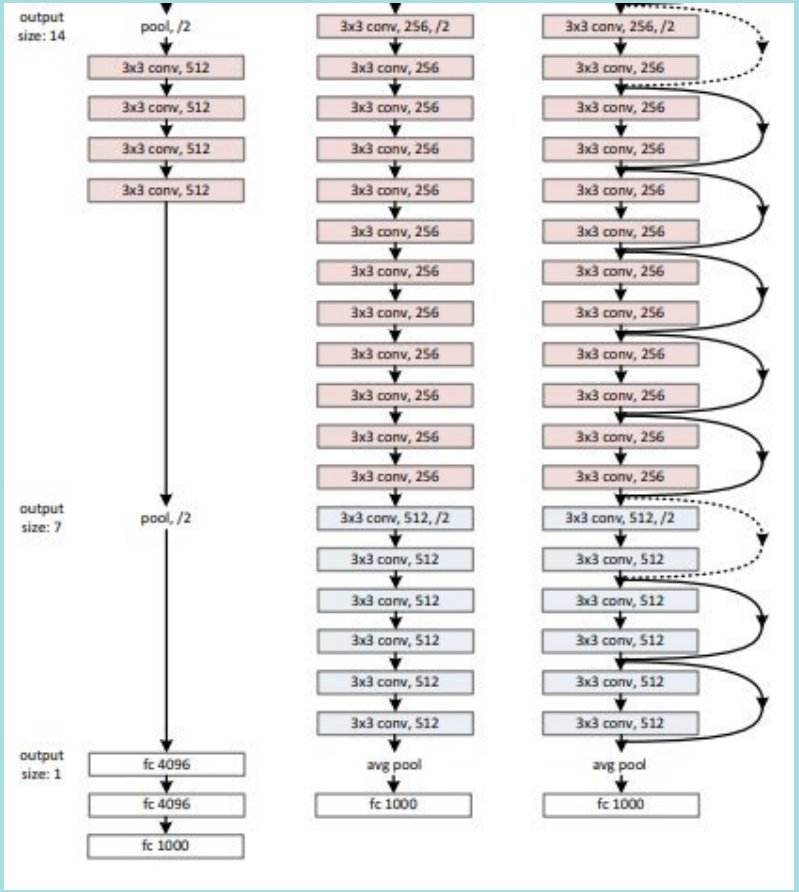
Grading Policy

Quiz : 30%
Midterm : 30%
Final exam : 40%

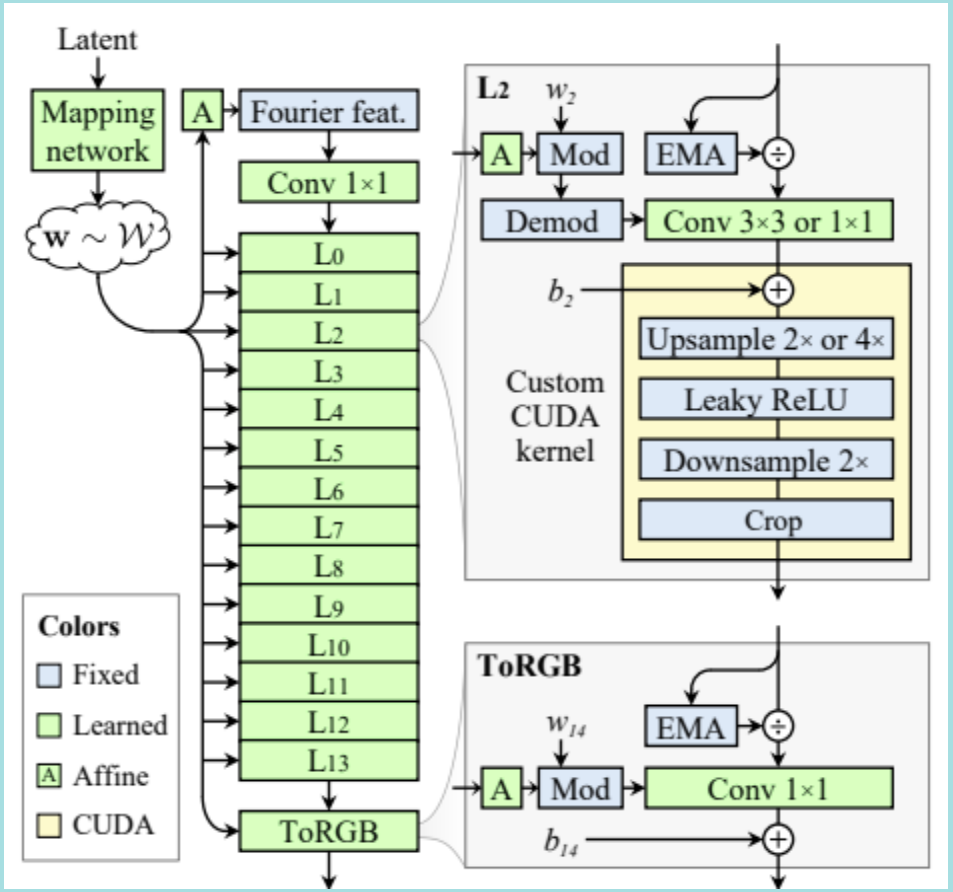
About deep learning (Neural Network)



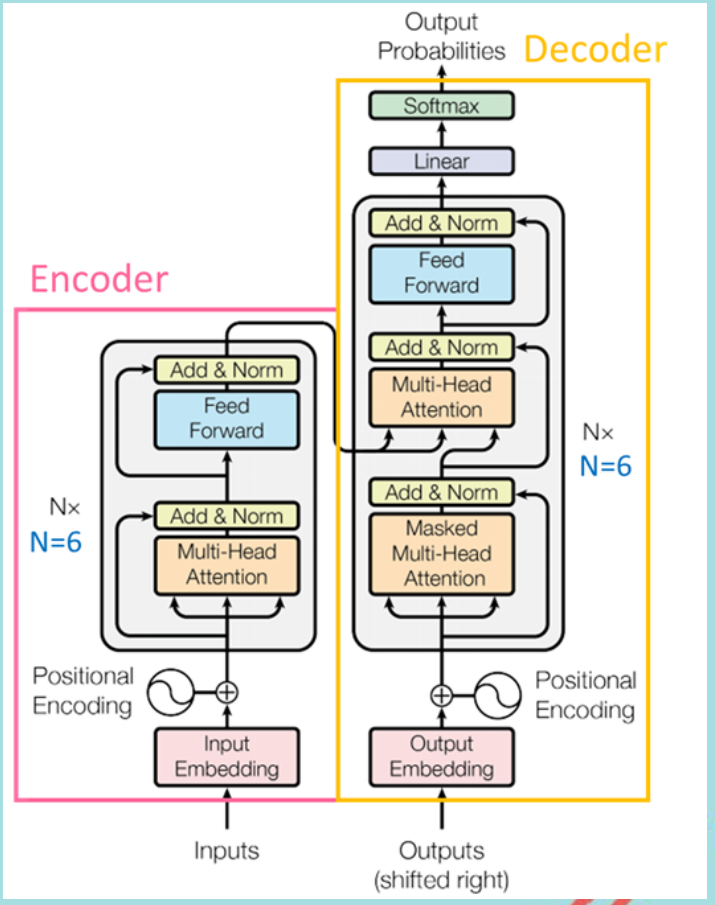
Various deep learning models



ResNet model

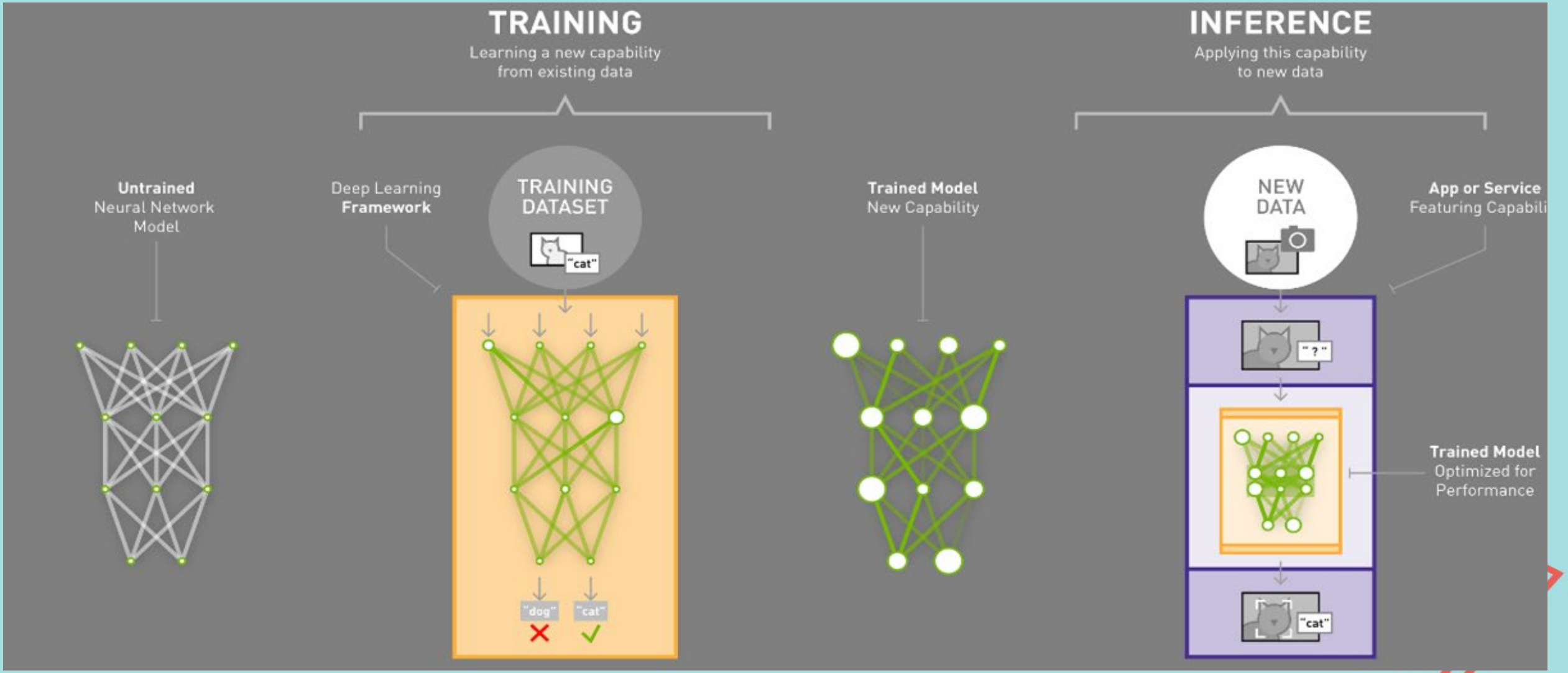


StyleGAN model

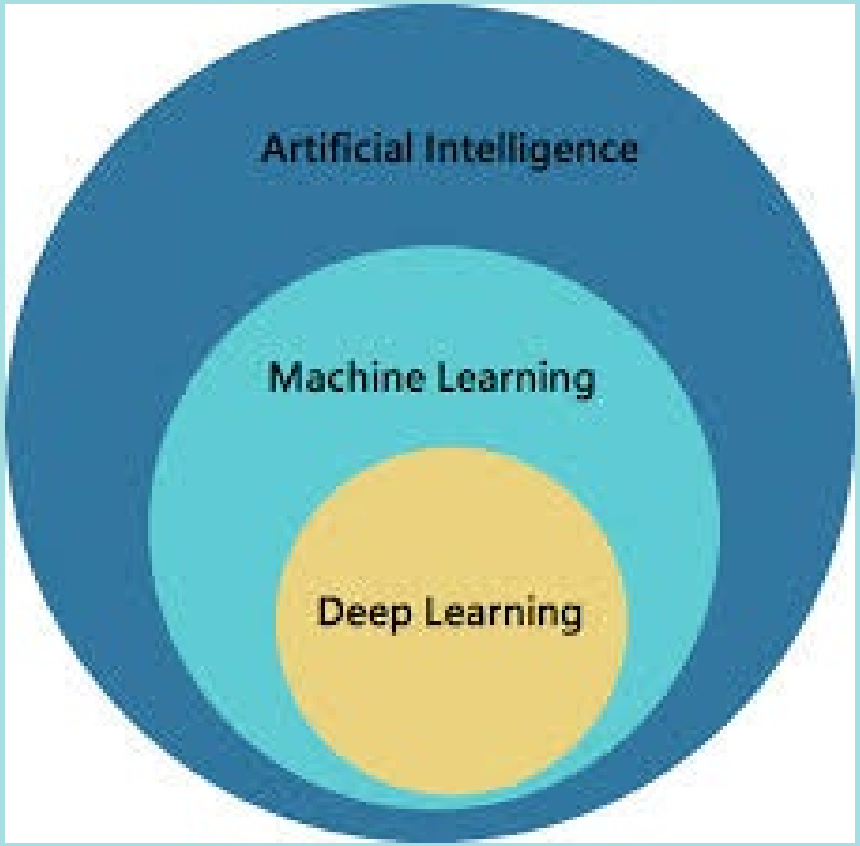


Transformer model

How DL works?


TRAINING
Learning a new capability
from existing data
Untrained
Neural Network
Model
Deep Learning
Framework
TRAINING
DATASET
"cat"
"dog"
"cat"
Trained Model
New Capability
INFERENCE
Applying this capability
to new data
NEW
DATA
App or Service
Featuring Capabili
" ? "
"cat"
Trained Model
Optimized for
Performance

About AI, ML, DL

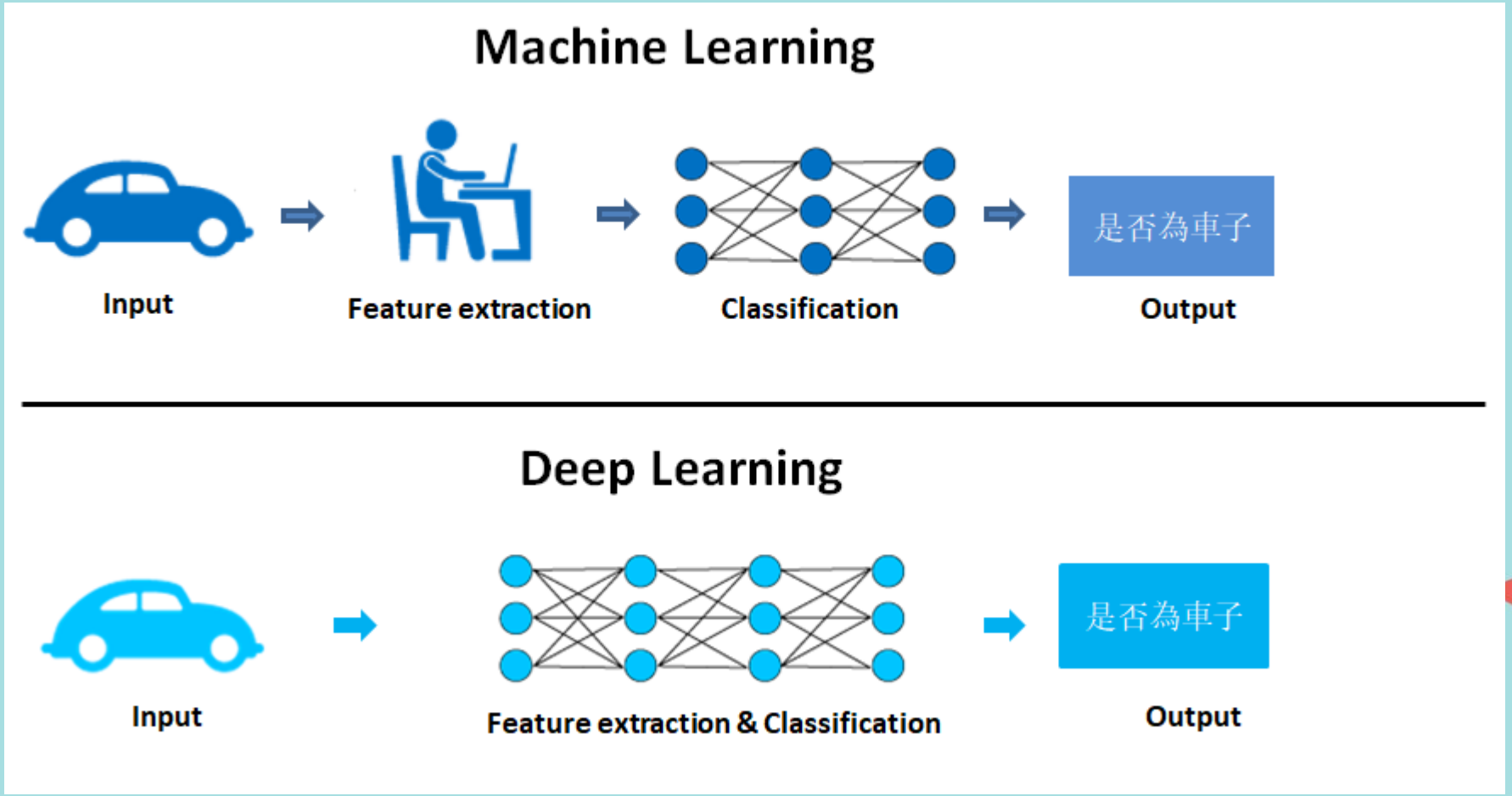


Artificial Intelligence, AI

Machine learning, ML

Deep learning, DL

ML VS DL

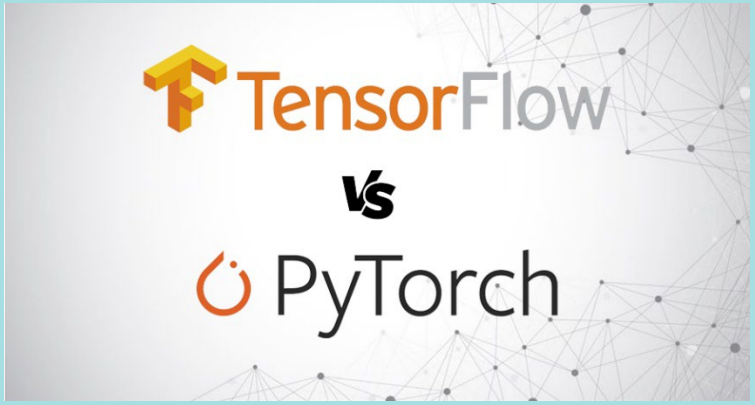

Machine Learning
Input
Feature extraction
Classification
是否為車子
Output
Deep Learning
Input
Feature extraction & Classification
是否為車子
Output

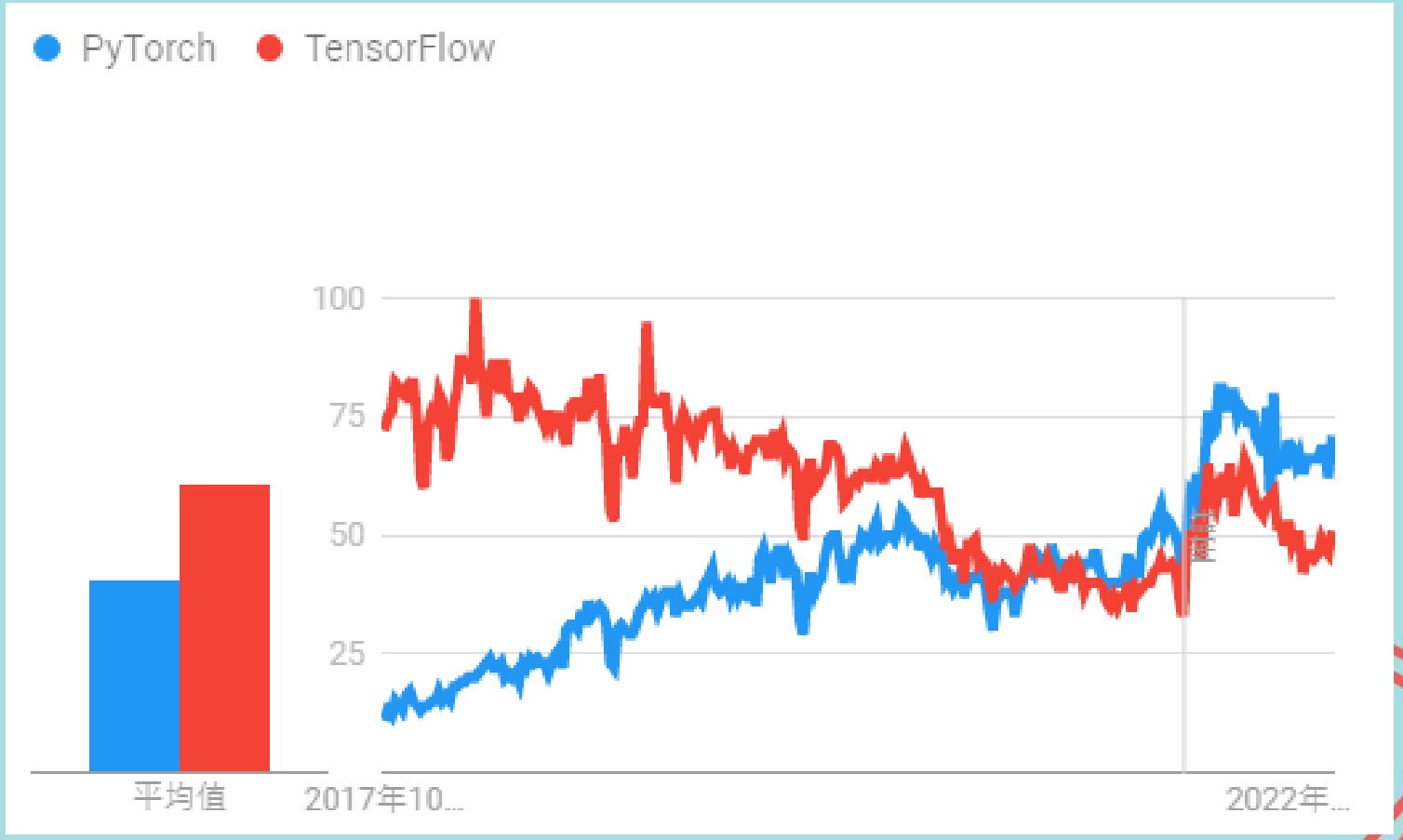
Deep Learning Code Components

Deep learning related packages

1. Python: https://www.python.org/
2. NumPy: https://numpy.org/
3. pandas: https://pandas.pydata.org/
4. OpenCV: https://opencv.org/
5. Pillow: https://pillow.readthedocs.io/
6. scikit-learn: https://scikit-learn.org/
7. scikit-image: https://scikit-image.org/
7. TensorFlow: https://www.tensorflow.org/
8. Keras: https://keras.io/
9. PyTorch: https://pytorch.org/

PyTorch vs. TensorFlow





Thanks!

Q&A