



深度學習 Deep Learning (1)

112-1

朱學亭老師



大綱

- 課程規定
- 課程大綱
- 教材
- 工具



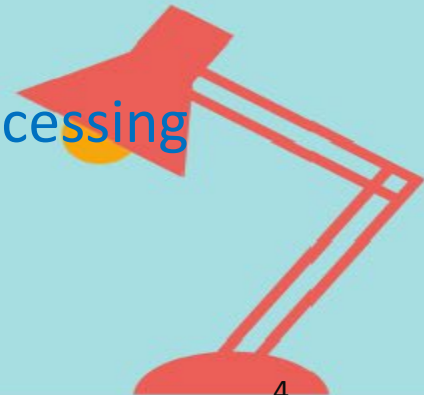
課程規定

- 期中是個人成績、期末是分組成績
- 期中作業: 2-3個PyTorch作業
- 期末作業: 使用TensorFlow或PyTorch都可以



課程大綱

- W1-課程介紹/Introduction
- W2-深度學習與PyTorch函式庫
- W3-預先訓練的模型
- W4-介紹張量
- W5-用張量表示現實中的資料
- W6-學習的機制
- W7-使用神經網路來擬合資料
- W8-從圖片中學習
- W9-Midterm presentation
- W10-卷積神經網路
- W11-利用PyTorch對抗癌症
- W12-訓練模型分辨結節的真假
- W13-評估改善訓練成效
- W14-不同類型的資料分割
- W15-ImageCaptioning
- W16-Natural Language Processing
- W17-音訊分類
- W18-Final presentation



課本-PyTorch深度學習攻略



The book cover for 'PyTorch 深度學習攻略' (PyTorch Deep Learning Strategy) is shown. It features the title in both English and Chinese, the subtitle '核心開發者親授!' (Taught by Core Developers!), and a list of authors including Eli Bendersky, Luca Colletti, and others. The cover also has a small illustration of a person in a long coat.

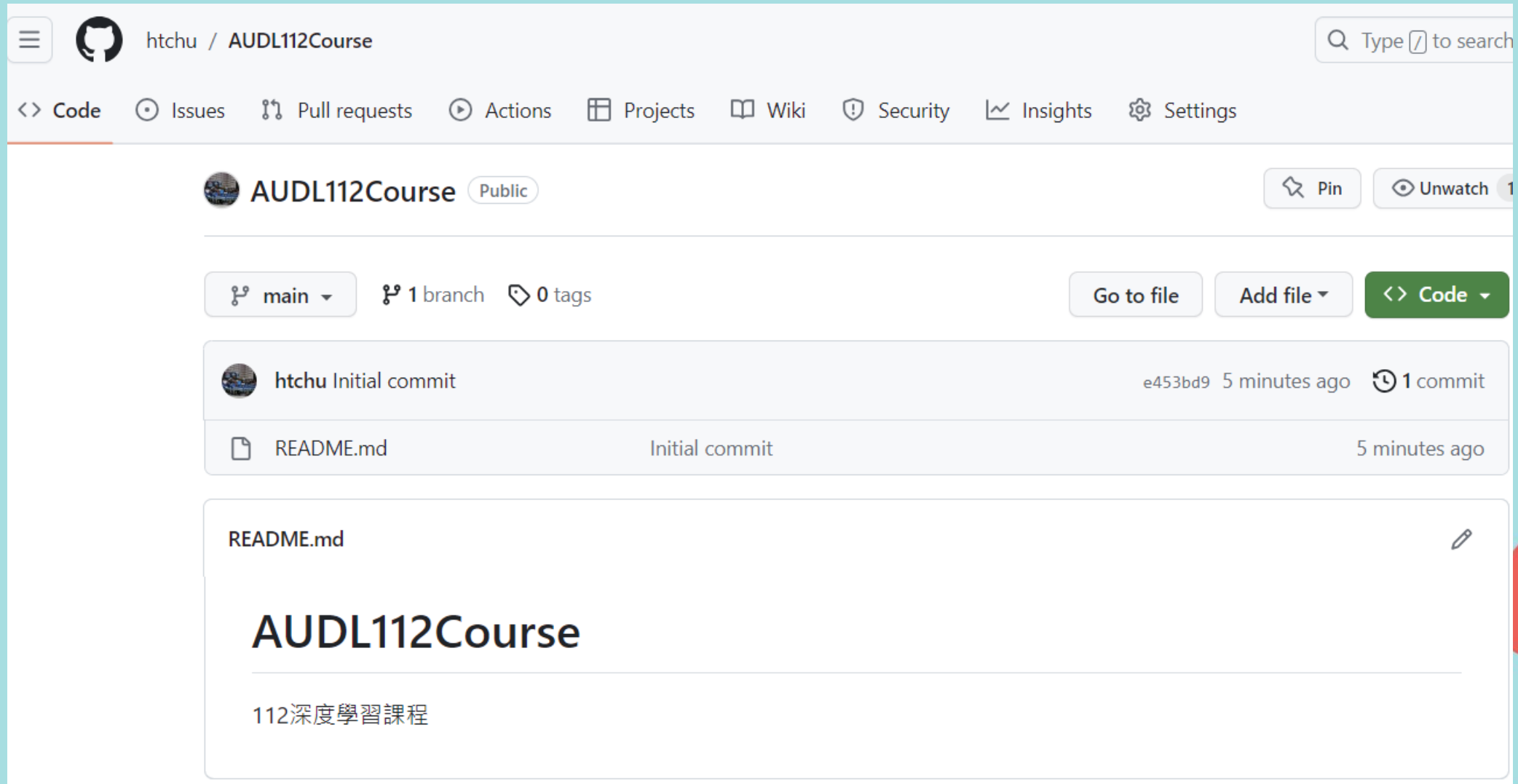
PyTorch

核心開發者親授

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README.md Initial commit 5 minutes ago

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AUDL112Course

112深度學習課程

Textbook Gitbook



Deep Learning with PyTorch

Code to accompany the DLwPT book.




<https://www.manning.com/books/dee...>

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Popular repositories

dlwpt-code Public




Code for the book Deep Learning with PyTorch by Eli Stevens, Luca Antiga, and Thomas Viehmann.

 Jupyter Notebook  3.2k  1.3k

ImageCaptioning.pytorch Public

Forked from ruotianluo/ImageCaptioning.pytorch

image captioning codebase in pytorch(finetunable cnn in branch "with_finetune";diverse beam search can be found in 'dbs' branch; self-critical training is under my self-critical.pytorch repository.)






 Python  77  51

Repositories

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ImageCaptioning.pytorch Public

image captioning codebase in pytorch(finetunable cnn in branch "with_finetune";diverse beam search can be found in 'dbs' branch; self-critical training is under my self-critical.pytorch repository.)

 Python  77  355  0  2 Updated on 12 Apr 2021

dlwpt-code Public

Code for the book Deep Learning with PyTorch by Eli Stevens, Luca Antiga, and Thomas Viehmann.

 Jupyter Notebook  3,187  1,321  51  1 Updated on 23 Jan 2021



Deep Learning EBooks

aniruddhachoudhury / Data-Science-Books Public

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aniruddhachoudhury Add files via upload 75543dc on 22 Oct 2019 13 commits

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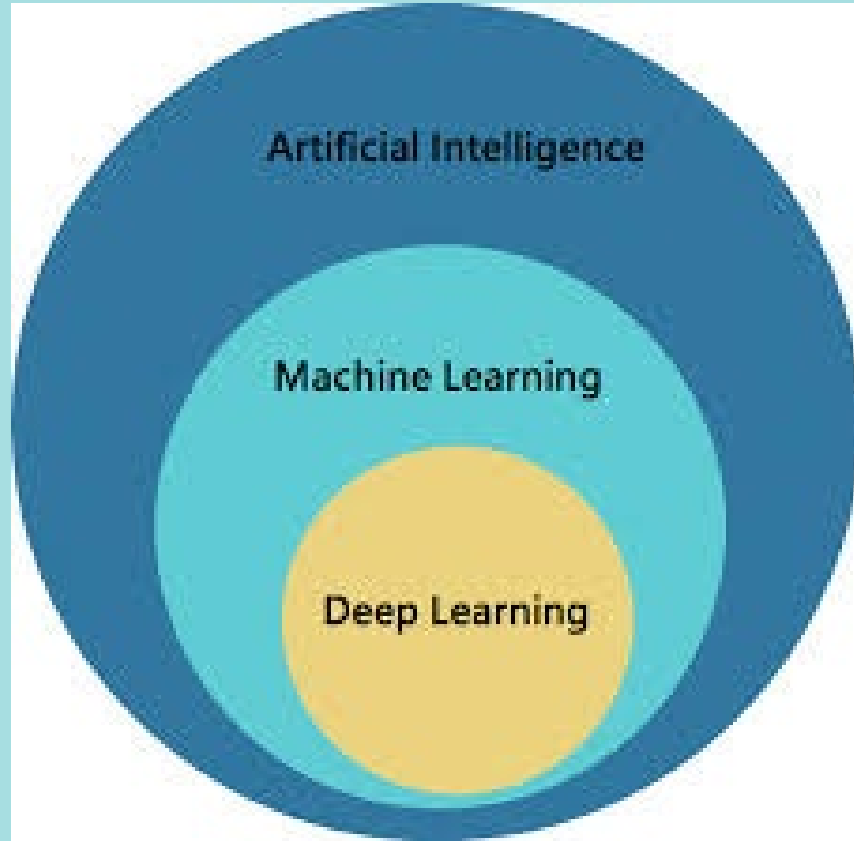


深度學習

- W1:課程介紹/Python程式練習
- Part 1: Machine learning
- Part 2: Deep learning
- Part 3: Python程式



AI, ML, DL



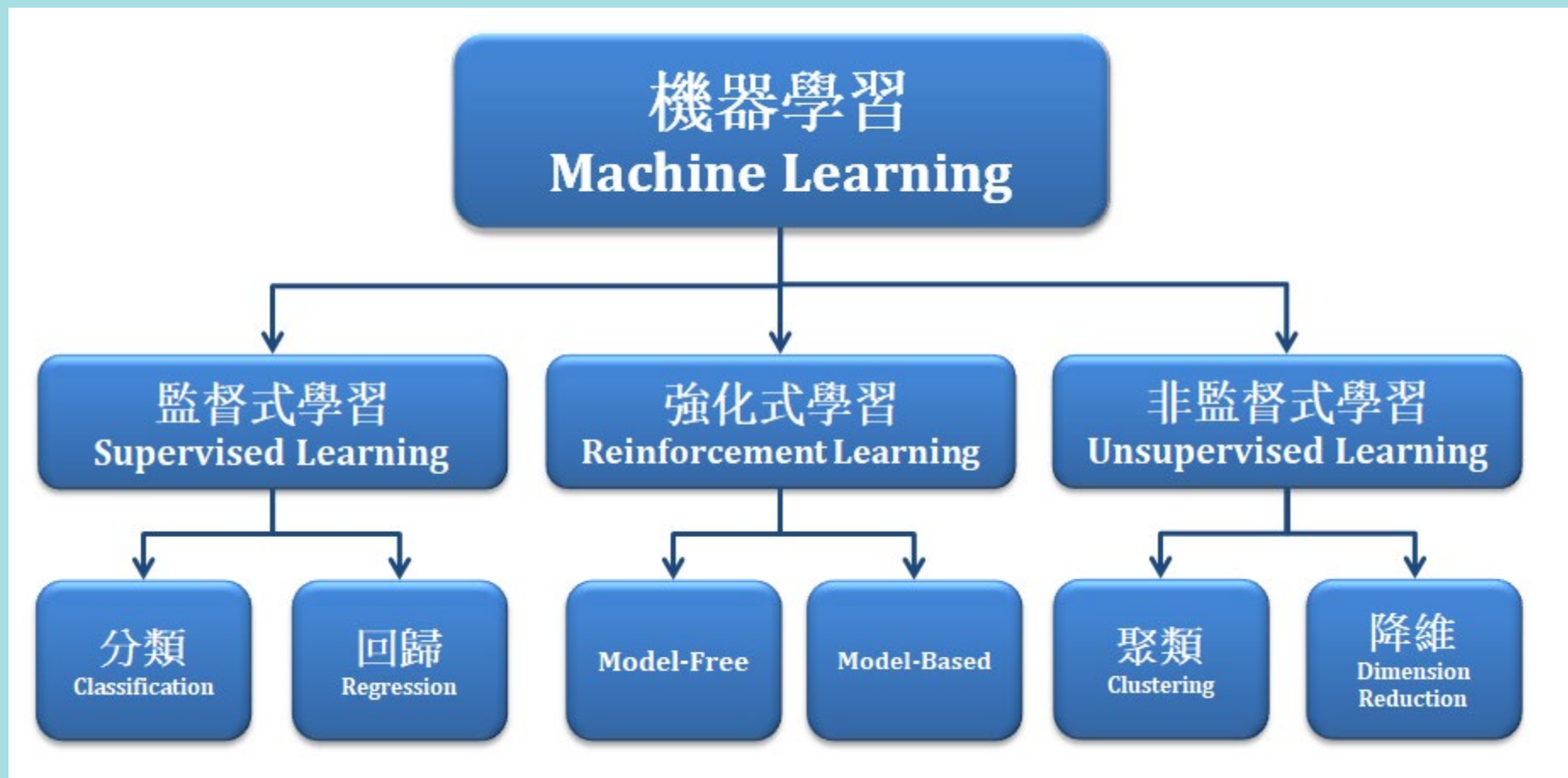
人工智慧(Artificial Intelligence, AI)

機器學習(machine learning, ML)

深度學習(deep learning, DL)

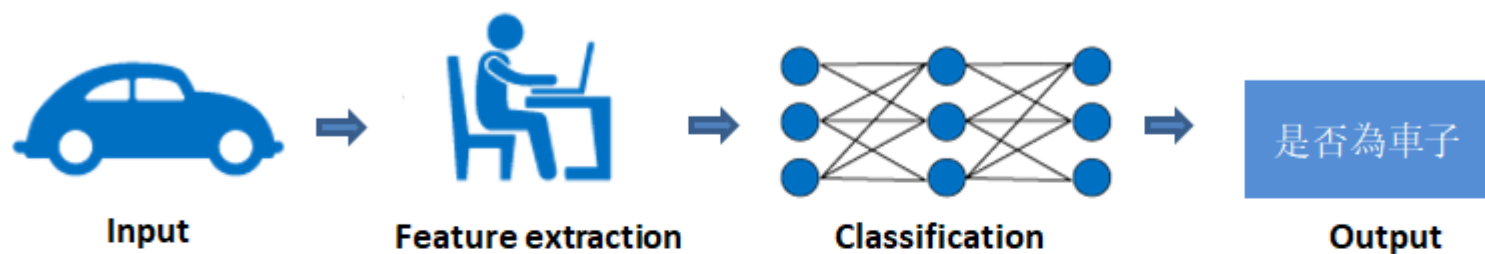


機器學習

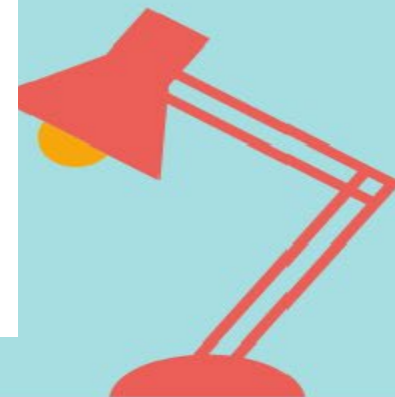


ML VS DL

Machine Learning



Deep Learning



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Topic List



語音資料辨識分類

讓機器理解人類語音所表達的訊息，一直以來是業界、學界共同努力的方向。語音辨識 (speech recognition) 技術...

2020-01-16 ~ 2020-04-15



展場民眾特徵分析

本議題為 2018 年於台北世貿中心連續舉辦三天的馬拉松運動博覽會，資料來自於裝設在展場出入口的攝影機擷取出約 38,0...

2019-12-25 ~ 2020-04-29



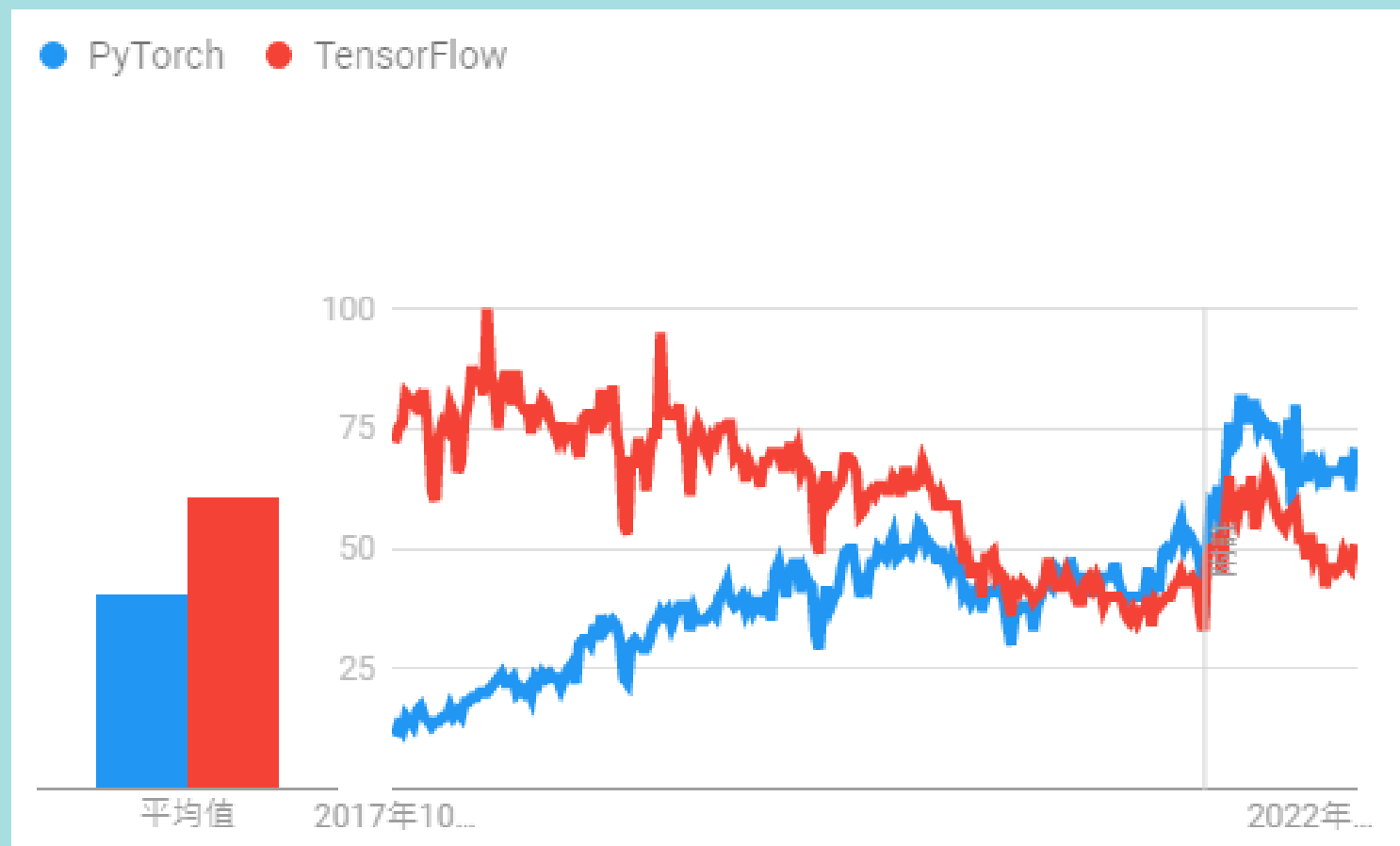
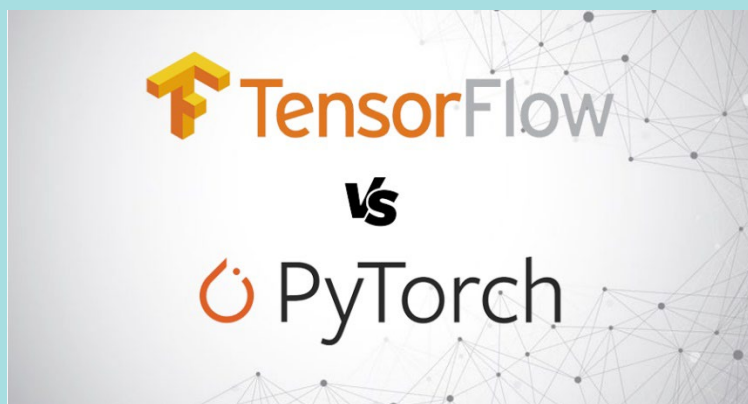
臺灣海洋廢棄物預測

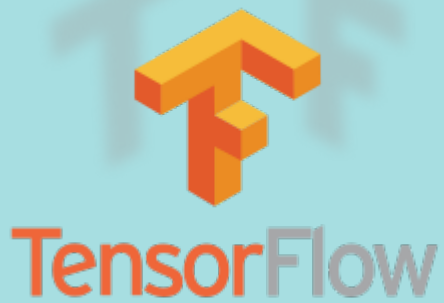
海洋廢棄物是全球關注的重大污染議題，科學研究顯示人造垃圾已經對生態、經濟造成重大且難以復原的影響。海洋廢棄物污染場域廣大...

2019-11-20 ~ 2020-03-04



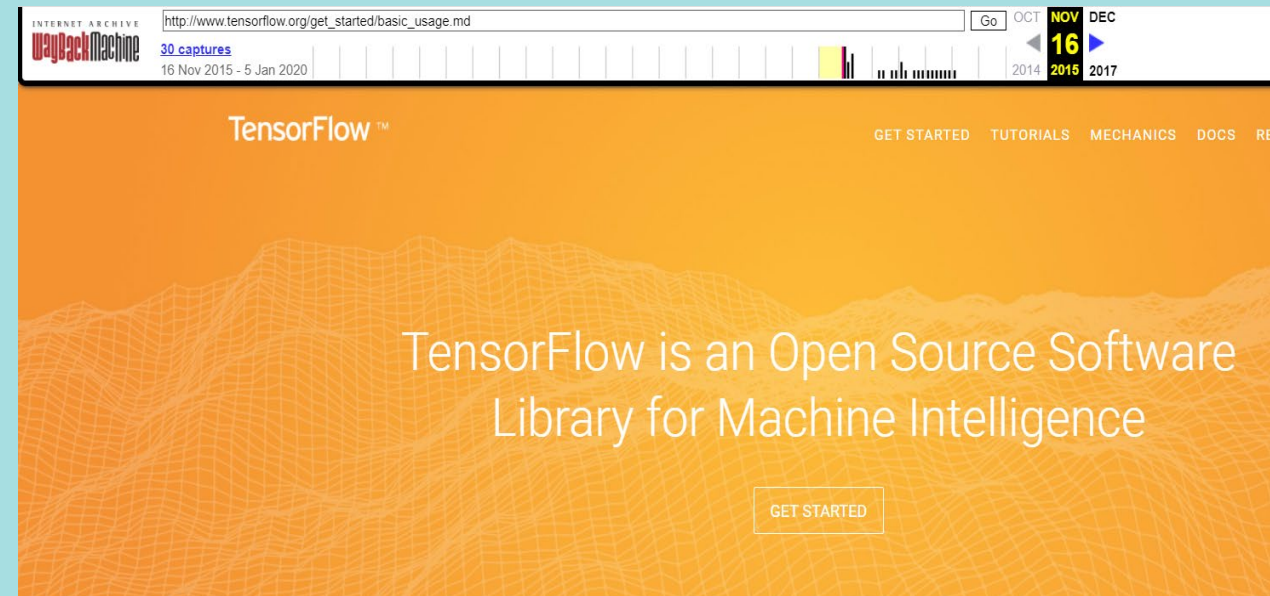
PyTorch vs. TensorFlow





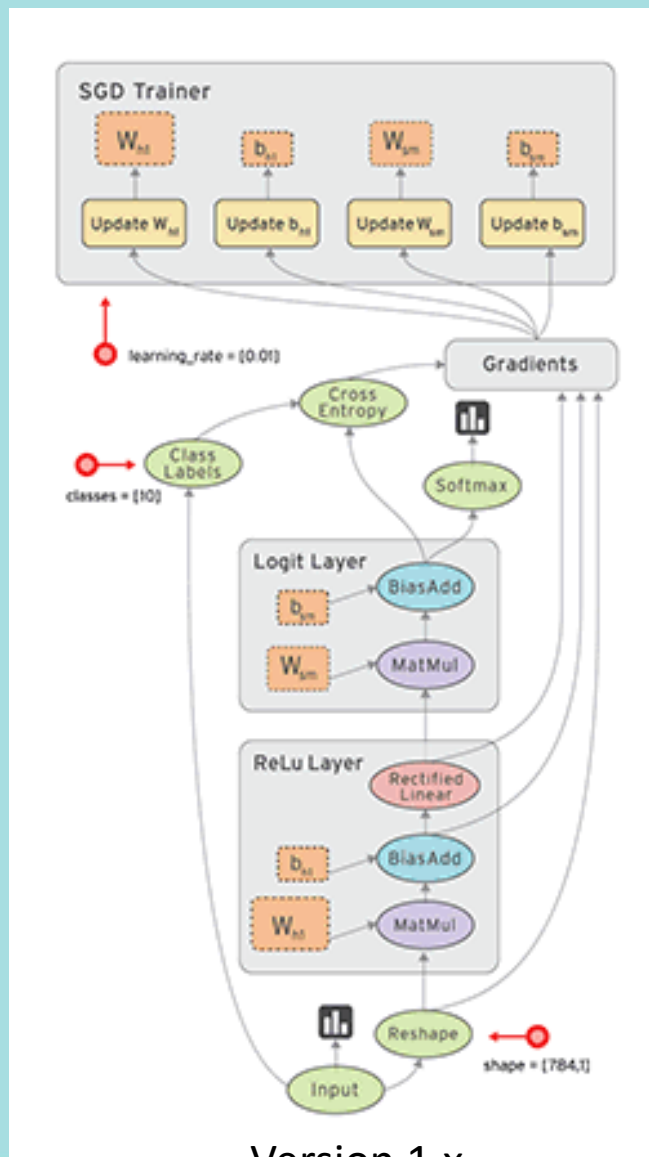
Tensorflow

TensorFlow	
Developer(s)	Google Brain Team ^[1]
Initial release	November 9, 2015;
Stable release	2.4.0 ^[2] / Dec. 14, 2020
Repository	github.com/tensorflow/tensorflow
Written in	Python , C++ , CUDA
Platform	Linux , macOS , Windows , Android



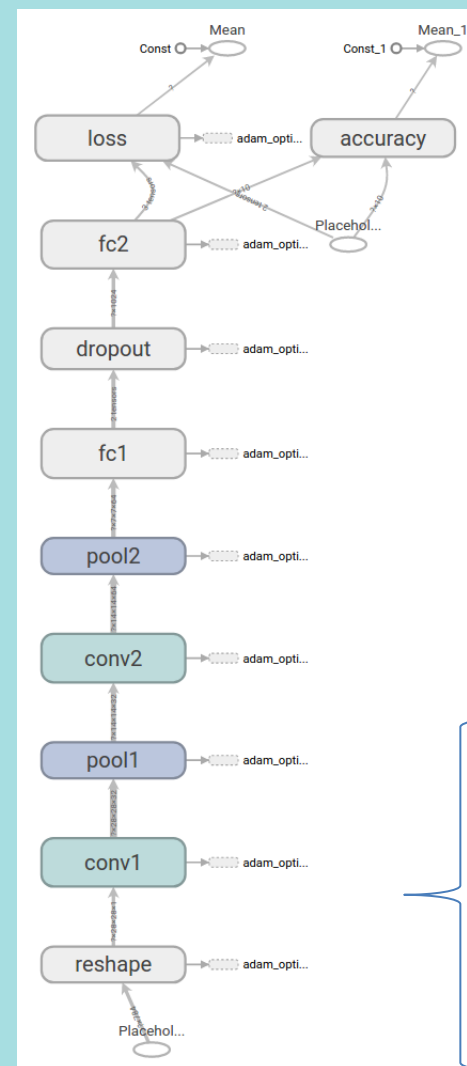
<https://web.archive.org/web/20151109150056/https://www.tensorflow.org/>

Tensorflow Version 1.x and 2.x



Version 1.x

tf.Graph
tf.Session
tf.Variable
tf.Tensor
tf.Constant
tf.Placeholder



Version 2.x: Eager + Keras API

tf.keras
tf.data
tf.GradientTape

Graph mode

Eager mode

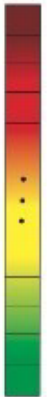
tf.Graph

tf.Eager

What is a tensor

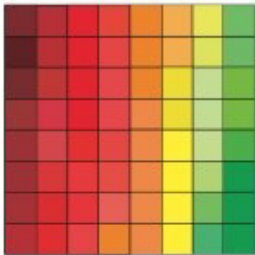
tensor = multidimensional array

vector



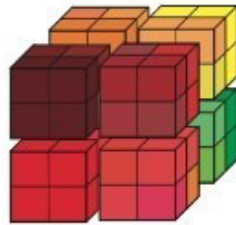
$$\mathbf{v} \in \mathbb{R}^{64}$$

matrix



$$\mathbf{X} \in \mathbb{R}^{8 \times 8}$$

tensor

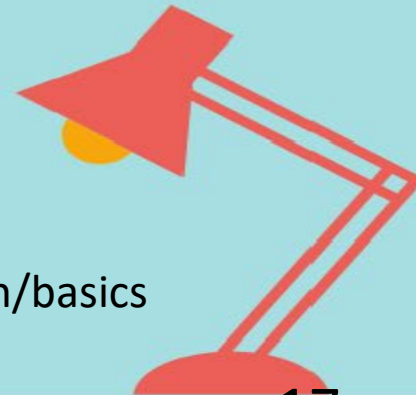


$$\mathcal{X} \in \mathbb{R}^{4 \times 4 \times 4}$$

```
ndarrayB = tf.make_ndarray(  
    tensorA  
)
```

```
tensorA = tf.convert_to_tensor(  
    ndarrayA, dtype=None, dtype_hint=None, name=None  
)
```

<https://www.tensorflow.org/tutorials/customization/basics>



Deep Learning Code Components



NumPy

matplotlib



pandas



python



OpenCV



pillow



scikit-image
image processing in python



PyTorch



Keras



TensorFlow

AI programming stack

1. Python: <https://www.python.org/> (基礎程式設計)
2. NumPy: <https://numpy.org/> (資料科學)
3. pandas: <https://pandas.pydata.org/> (資料科學)
4. OpenCV: <https://opencv.org/> (數位影像處理)
5. Pillow: <https://pillow.readthedocs.io/> (數位影像處理)
6. scikit-image: <https://scikit-image.org/> (數位影像處理)
7. scikit-learn: <https://scikit-learn.org/> (機器學習)
8. TensorFlow: <https://www.tensorflow.org/> (深度學習)
9. Keras: <https://keras.io/> (深度學習)
10. PyTorch: <https://pytorch.org/> (深度學習)



Thanks!

Q&A

