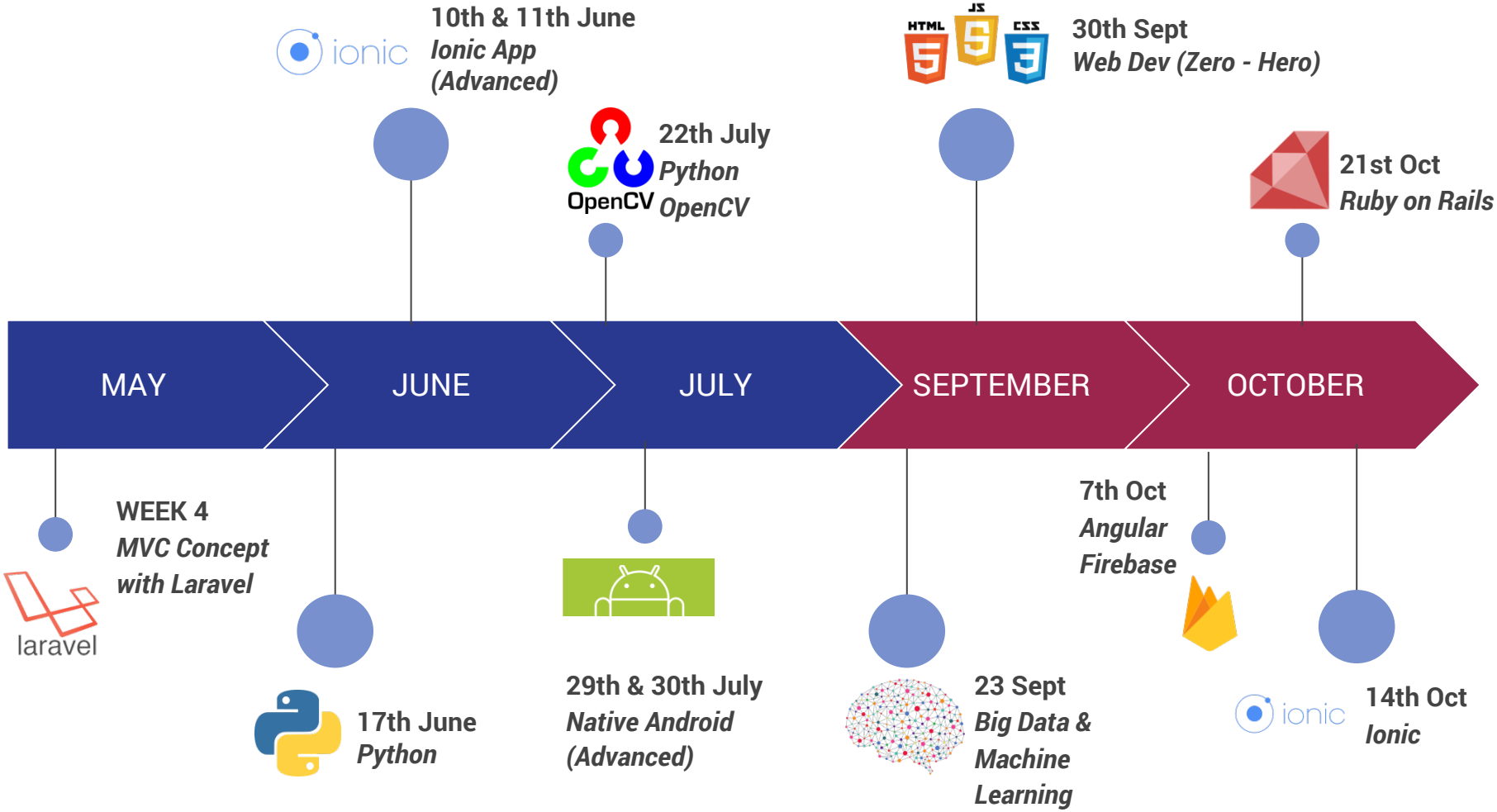
Asas ’Machine Learning’ dan ‘Deep Learning’ menggunakan Python

Tentang Kofix

- Berfokuskan kepada latihan IT industri, dan pembinaan aplikasi mudah alih dan juga laman sesawang.

- Telah beroperasi hampir 2 tahun di Perak, dan telah mengajar di hampir 10 universiti sekitar Malaysia.

- Diasaskan oleh 4 orang anak muda semasa zaman universiti.


10th & 11th June
Ionic App
(Advanced)
22th July
Python
OpenCV
OpenCV
30th Sept
Web Dev (Zero - Hero)
21st Oct
Ruby on Rails
MAY
JUNE
JULY
SEPTEMBER
OCTOBER
WEEK 4
MVC Concept
with Laravel
17th June
Python
29th & 30th July
Native Android
(Advanced)
23 Sept
Big Data &
Machine
Learning
7th Oct
Angular
Firebase
14th Oct
Ionic

Kofix

What we are doing ?

What we want is to make the peoples in the country to be an IT specialist, and make them prepared to face the advancement of technologies, especially in programming, website development, mobile application development, internet of things and artificial intelligent by giving **IT training**.

Training & Courses

- MVC Concept with Laravel Framework
- Hybrid Mobile App using Ionic Framework
- Python for Beginner
- Computer Vision with Python OpenCV
- Android App Development using Android Studio
- Web Development Zero to Hero
- Angular Firebase
- Web Development with Ruby on Rails
- Build ecommerce website with Wordpress
- Machine Learning for Beginner
- Deep Learning using TensorFlow
- Deep Learning for Computer Vision
- NLP with Deep Learning
- Python for Data Scientist
- Chatbots Development

THE SERVICE YOU EXPECT
THE QUALITY YOU DESERVE

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6012-3272356 (SHAZLYN)
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PERAK

Kofix

www.kofixlabs.co

kofixtech

Kofix Technologies Resources

kofixtech

Muhammad Nazmi Bin Mat Asri

Education:

- Self-taught coders
- Certified Ethical Hacker (V8)
- Mobile App Developer
  - Android Native Using Java
  - Ionic Hybrid App
  - React Native
  - Ios Native Using Swift 3
- Web App Developer
  - Laravel PHP Framework 5.4
- Data Scientist

Designation:

- CEO Kofix Technologies Resources
- Data Scientist
- Trainer

Perkara

- Perkara yang perlu diketahui
- Asas Machine Learning dan aplikasi
- Asas Deep Learning dan aplikasi
- Praktikal Machine Learning dan Deep Learning

Soalan...

- Berapa ramai di sini yang **pernah dengar** Machine Learning ?
- Berapa ramai di sini yang **tahu apa itu** Machine Learning ?
- Berapa ramai di sini yang **guna** Machine Learning ?

Bagaimana pula dengan Deep Learning ?

Machine Learning

- Salah satu cabang daripada Artificial Intelligence.
- Dinamakan Machine Learning disebabkan kebolehan sistem tersebut untuk belajar tanpa diprogram secara spesifik dan jelas untuk menyelesaikan masalah tersebut.
- Sistem itu boleh belajar menggunakan data terkumpul terdahulu.
- Sesebuah komputer dikatakan belajar daripada ‘pengalaman’ berdasarkan beberapa ‘aktiviti’ yang diberi, dan ‘diukur kebolehannya’ sekiranya kebolehan sistem untuk melaksanakan aktiviti itu, boleh meningkatkan kebolehannya dengan pengalaman yang lebih banyak.

Terminologi

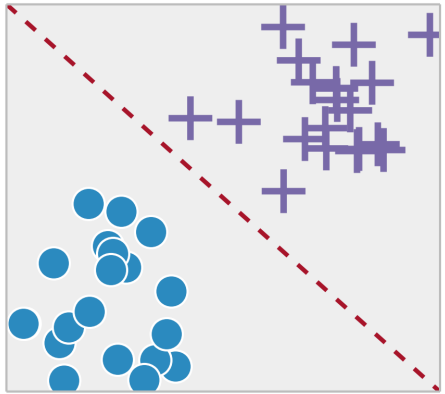
- Data Latihan (Training Data)
- Data Ukuran (Testing Data)
- Ulangan kitaran (Iteration/loop)
- Atribut (Attributes, Parameters)
- Data Input (Input Data)
- Data Keluaran/ Data Yang ingin dicapai (Output Data, Target)

Jenis-jenis Machine Learning

- Supervised Learning (Pembelajaran Terarah)
- Unsupervised Learning (Pembelajaran Tidak Terarah)
- Reinforcement Learning (Pembelajaran Pengukuhan)

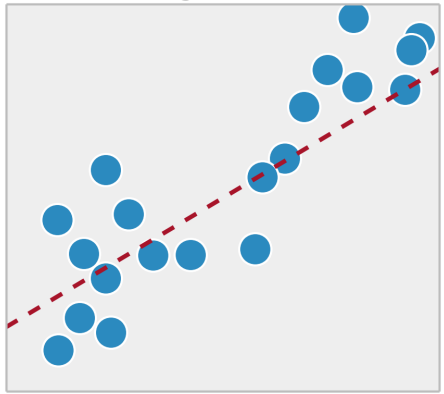
Supervised Learning (Pembelajaran Terarah)

Classification



Mempunyai kelas, contoh anjing dan kucing.

Regression

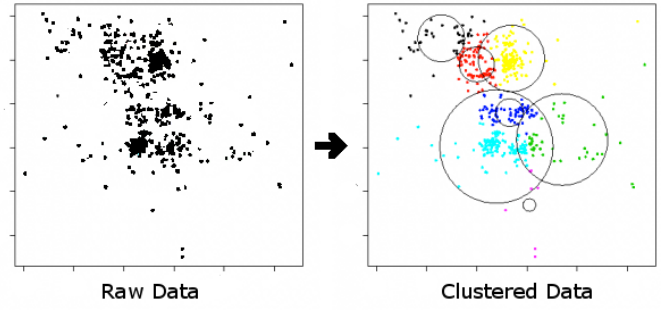


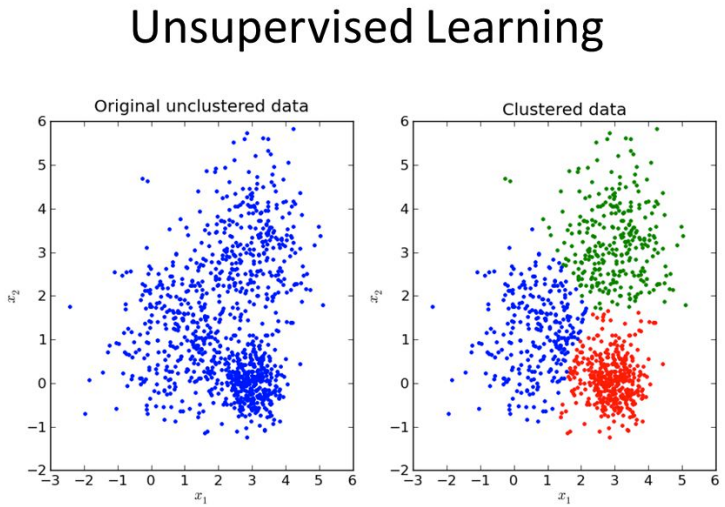
Diberi target data juga adalah nombor, yang perlu dianggar, contoh saiz rumah 100x100, harga RM300,000. Saiz rumah 120x120, berapa pula harganya ?

- Diberi data input dan target data, kemudian model machine learning perlu samada kelaskan atau jangka/anggar angka sesuatu pada satu satu masa.

Unsupervised Learning (Pembelajaran Tidak Terarah)

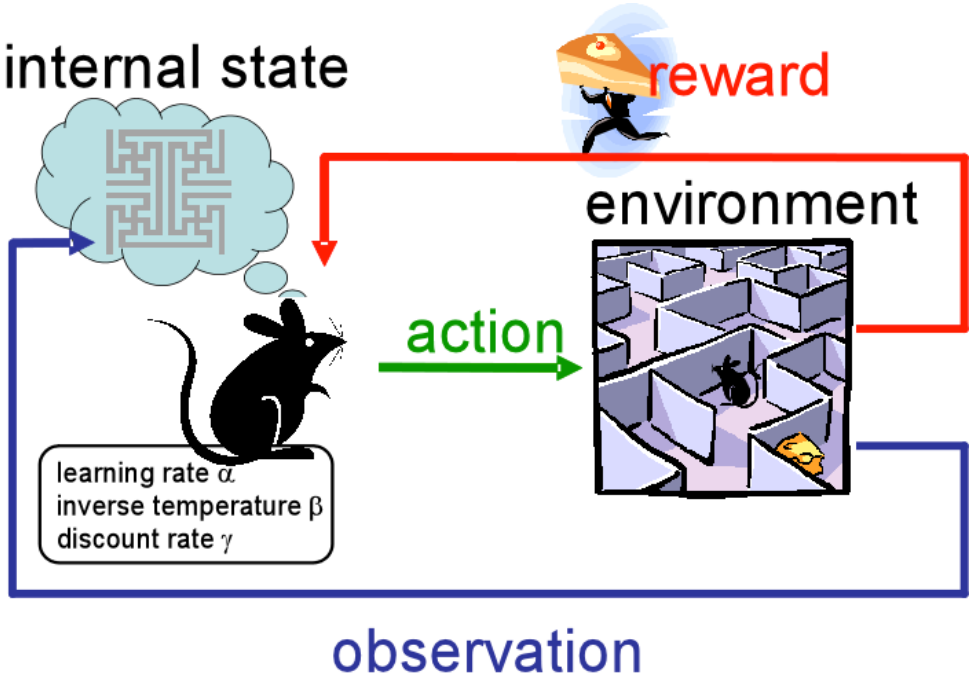
- Data input diberi, tetapi tiada data target.
- Contohnya, masalah clustering (pengelompokan) Kelompokan kumpulan.

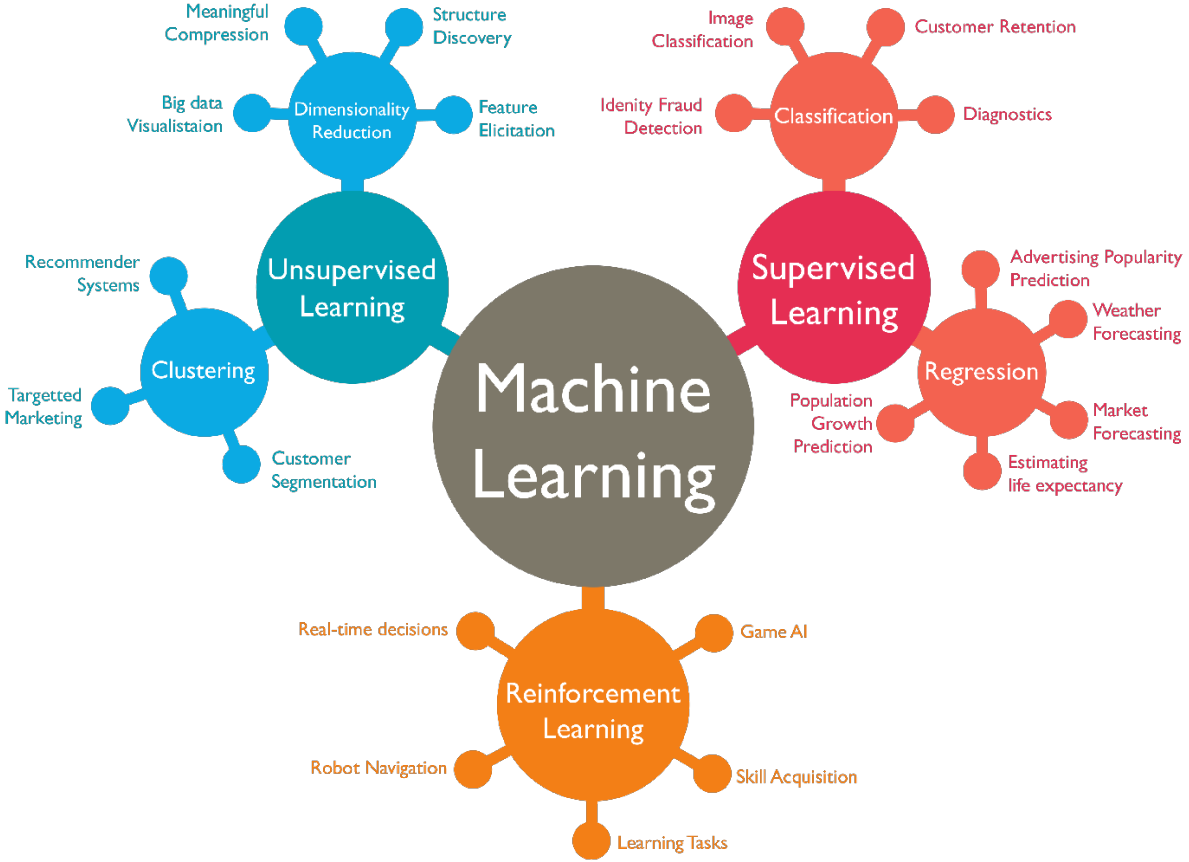




Reinforcement Learning (Pembelajaran Pengukuhan)

- Tiada target data, dan lebih berfokuskan kepada bagaimana sistem ingin menyelesaikan masalah tanpa diberitahu bagaimana.
- Sistem perlu menyesuaikan diri dengan persekitaran dan sekiranya perkara yang dilakukan adalah betul, ia diberi ganjaran.




Machine Learning
Unsupervised Learning
Dimensionality Reduction
Meaningful Compression
Structure Discovery
Big data Visualistaion
Feature Elicitation
Clustering
Recommender Systems
Targetted Marketing
Customer Segmentation
Supervised Learning
Classification
Image Classification
Customer Retention
Idenity Fraud Detection
Diagnostics
Regression
Advertising Popularity Prediction
Weather Forecasting
Population Growth Prediction
Market Forecasting
Estimating life expectancy
Reinforcement Learning
Real-time decisions
Game AI
Robot Navigation
Skill Acquisition
Learning Tasks

Jenis masalah

- Classification
- Regression
- Clustering
- Rule Extraction

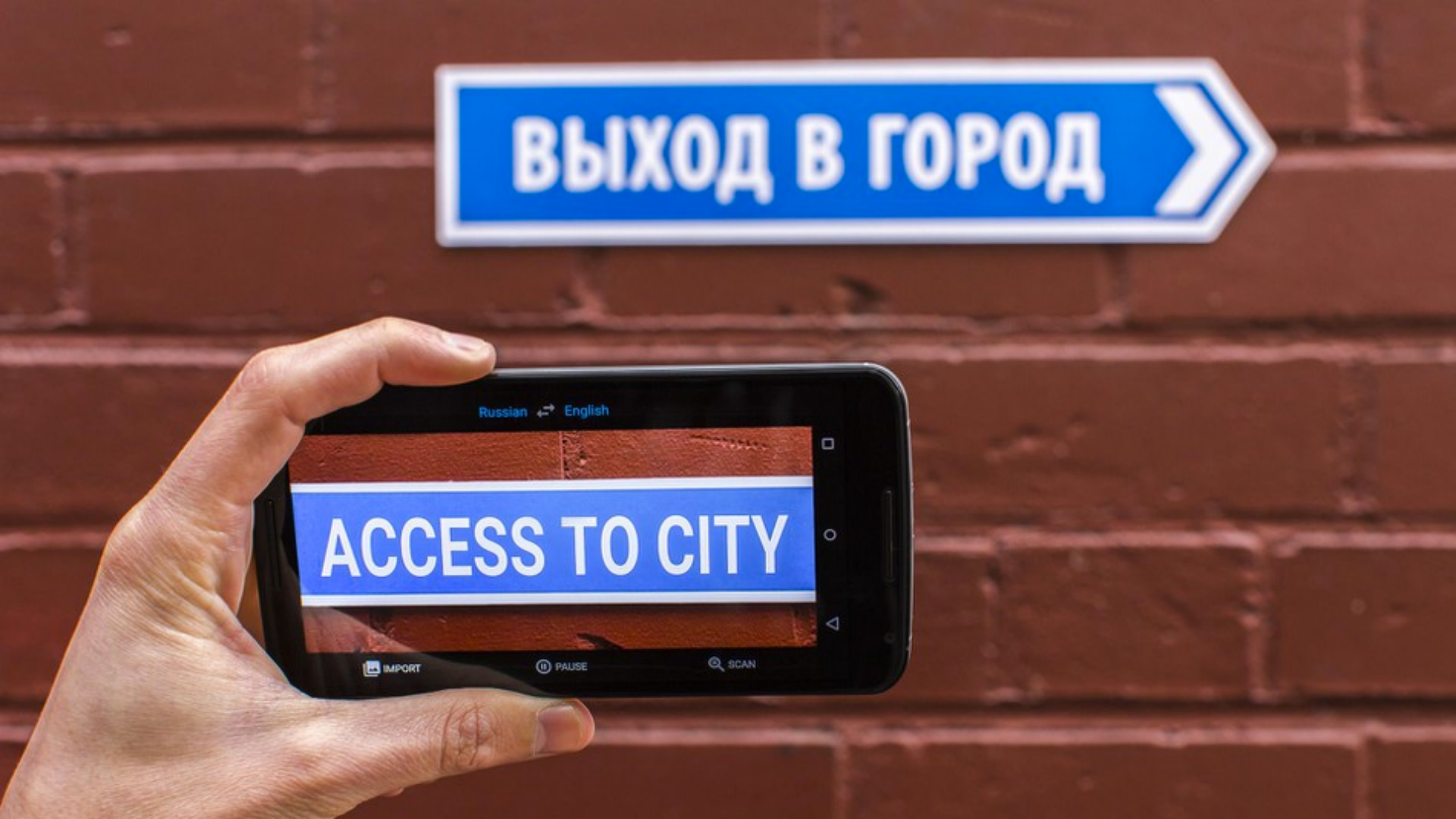
Contoh Masalah Yang Diselesaikan

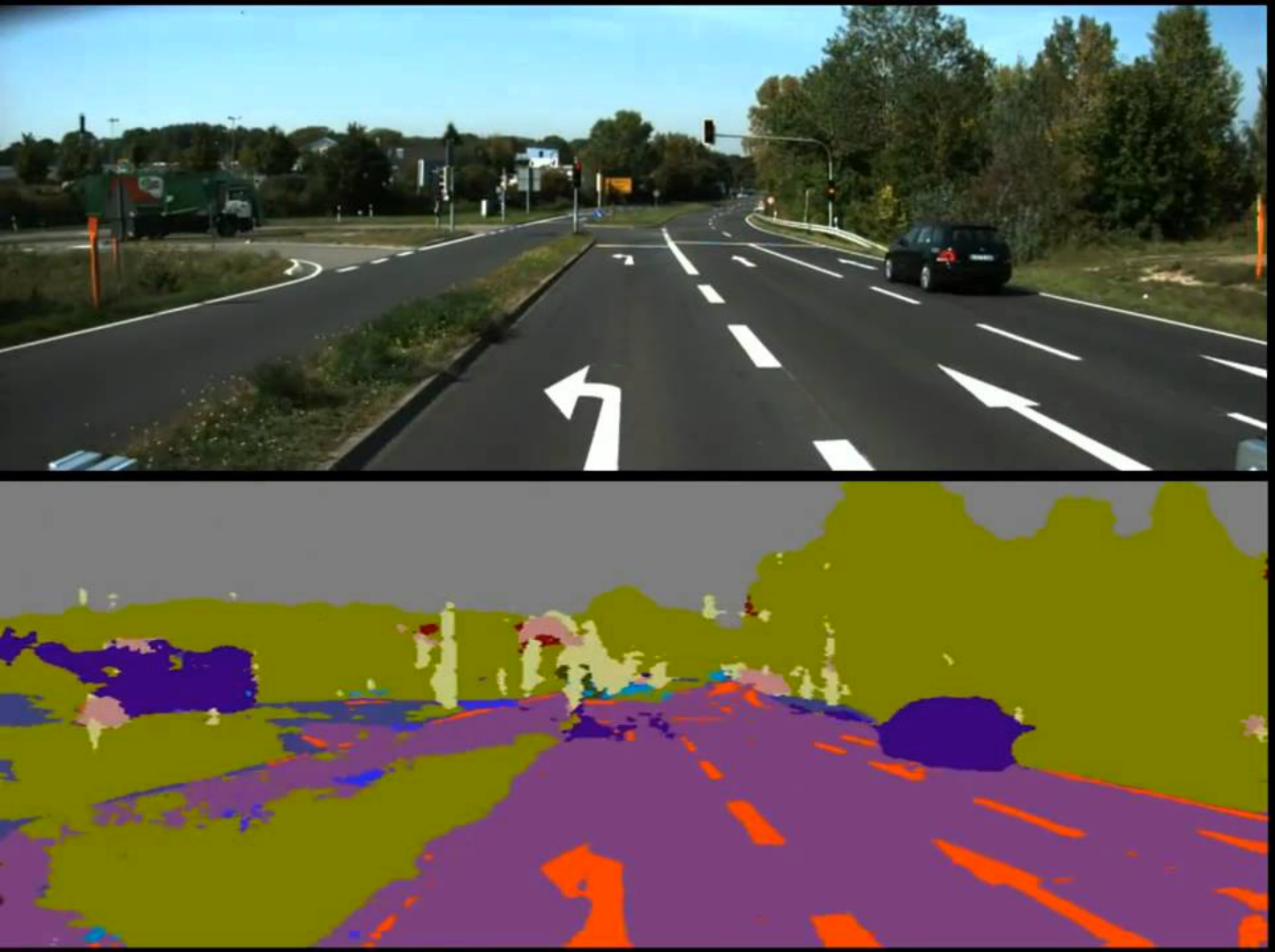
- Pengesan Spam
- Pengesan Pemalsuan Kad Kredit
- Pengenal nombor Digit
- Pemahaman tuturkata
- Pengesan muka
- Cadangan produk
- Pembahagian kelas pelanggan
- Pengenal bentuk

Praktikal Machine Learning

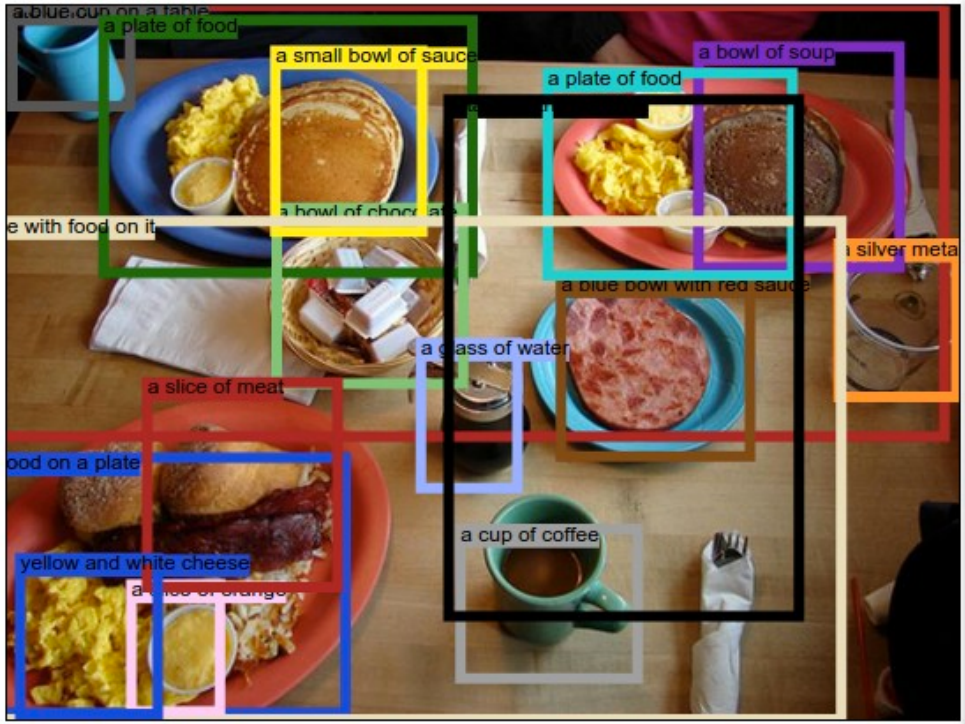
- Menggunakan Scikit-learn, Linear Regression
- Scikit-learn Logistic Regression
- Scikit-learn PCA
- Korelasi antara atribut
- XGBoost dan Decision Tree

Antara aplikasi Machine Learning dan Deep Learning


ВЫХОД В ГОРОД
Russian
English
ACCESS TO CITY
IMPORT
PAUSE
SCAN



Sky
Building
Pole
Road Marking
Road
Pavement
Tree
Sign Symbol
Fence
Vehicle
Pedestrian
Bike

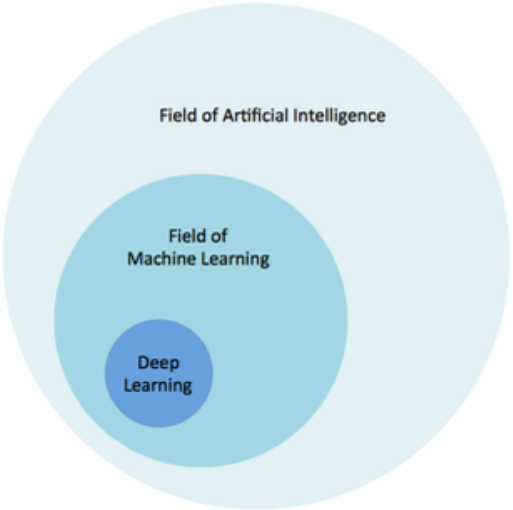


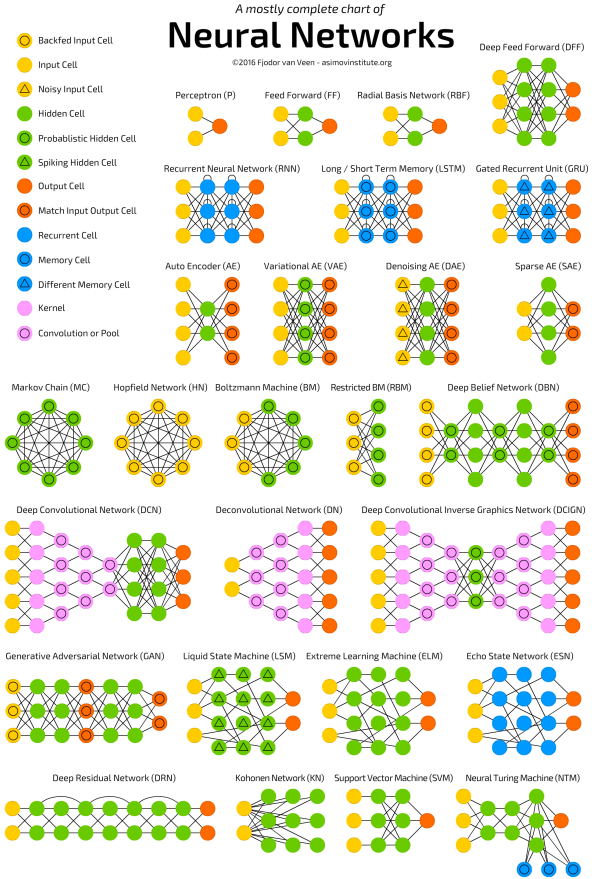
a plate of food. food on a plate. a blue cup on a table. a plate of food. a blue bowl with red sauce. a bowl of soup. a cup of coffee. a bowl of chocolate. a glass of water. a plate of food. a silver metal container. a small bowl of sauce. table with food on it. a slice of orange. a table with food on it. a slice of meat. yellow and white cheese.

bus parked on the street. a city street scene. front windshield of a bus. man walking on sidewalk. a silver car parked on the street. a city scene. a green traffic light. a building in the background. the bus has a number. a large building. a brick building. red brick building with windows. a blue sign with a white arrow. white lines on the road.

Deep Learning

- Salah satu cabang atau subset machine learning.
- Deep Learning adalah nama diberi kepada neural network yang mempunyai banyak lapisan tersembunyi (Hidden layer) atau lebih daripada dua (2) lapisan.
- Pelbagai bentuk dan susunan neural network sekarang membentuk deep learning untuk pelbagai jenis aplikasi dalam industri.




A mostly complete chart of
Neural Networks
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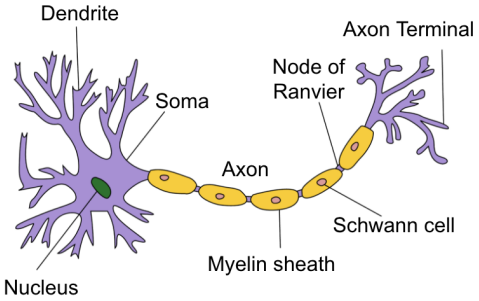
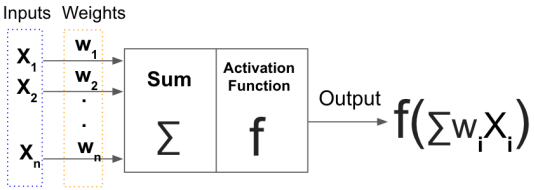
Backfed Input Cell
Input Cell
Noisy Input Cell
Hidden Cell
Probablistic Hidden Cell
Spiking Hidden Cell
Output Cell
Match Input Output Cell
Recurrent Cell
Memory Cell
Different Memory Cell
Kernel
Convolution or Pool
Perceptron (P)
Feed Forward (FF)
Radial Basis Network (RBF)
Deep Feed Forward (DFF)
Recurrent Neural Network (RNN)
Long / Short Term Memory (LSTM)
Gated Recurrent Unit (GRU)
Auto Encoder (AE)
Variational AE (VAE)
Denoising AE (DAE)
Sparse AE (SAE)
Markov Chain (MC)
Hopfield Network (HN)
Boltzmann Machine (BM)
Restricted BM (RBM)
Deep Belief Network (DBN)
Deep Convolutional Network (DCN)
Deconvolutional Network (DN)
Deep Convolutional Inverse Graphics Network (DCIGN)
Generative Adversarial Network (GAN)
Liquid State Machine (LSM)
Extreme Learning Machine (ELM)
Echo State Network (ESN)
Deep Residual Network (DRN)
Kohonen Network (KN)
Support Vector Machine (SVM)
Neural Turing Machine (NTM)

Konsep asal Deep Learning

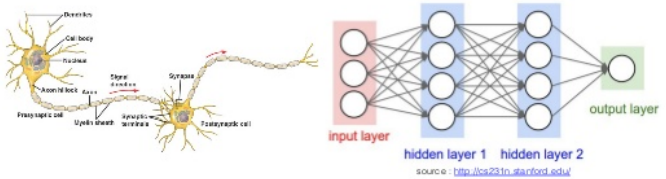
Artificial Neuron



Structure of a typical neuron
(source: Wikipedia)

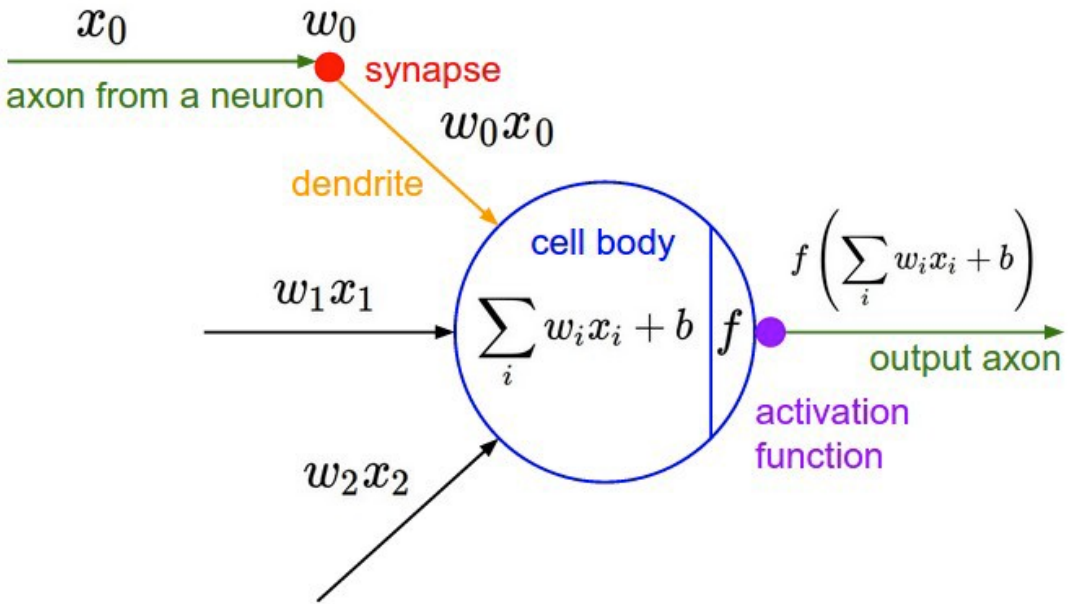


Structure of artificial neuron

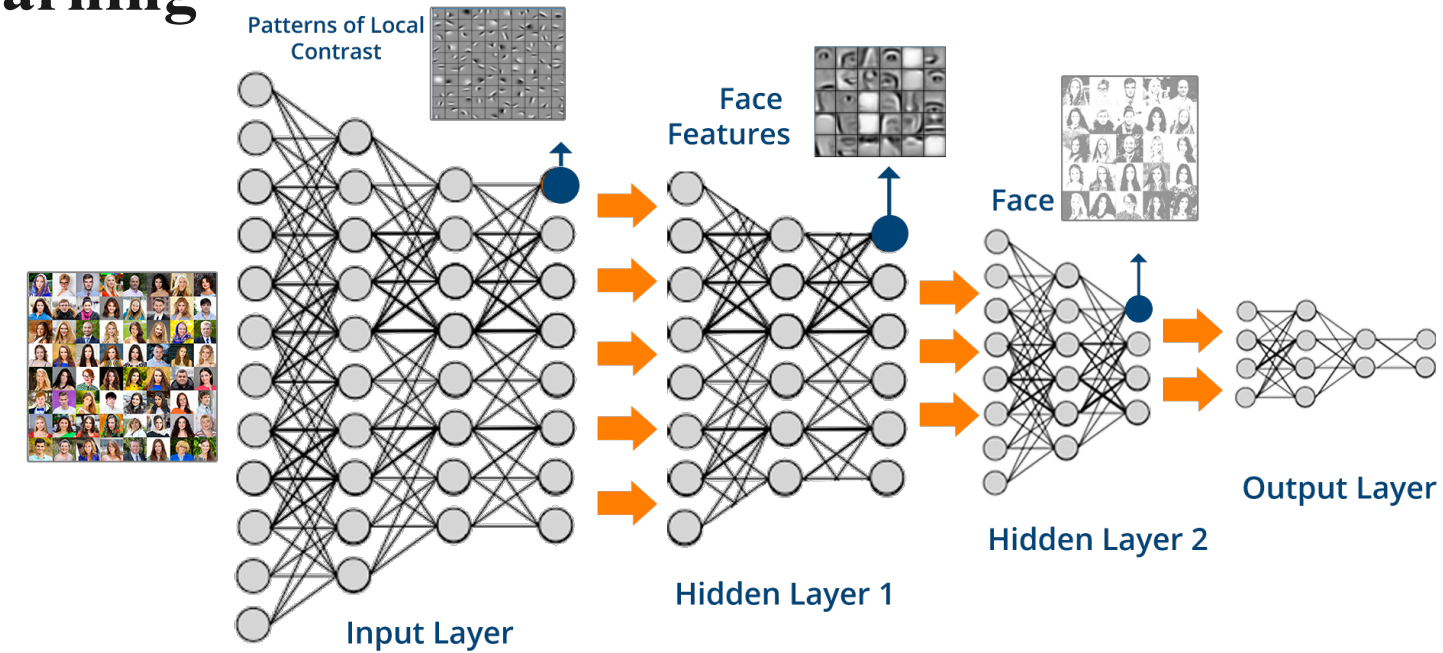


- Circles ——————————— Neuron
- Arrow ——————————— Synapse
- Weight ——————————— Electrical signal

Perceptron


x_0
w_0
axon from a neuron
synapse
$w_0 x_0$
dendrite
cell body
$w_1 x_1$
$\sum_i w_i x_i + b$
f
$f\left(\sum_i w_i x_i + b\right)$
output axon
activation function
$w_2 x_2$

Deep Learning



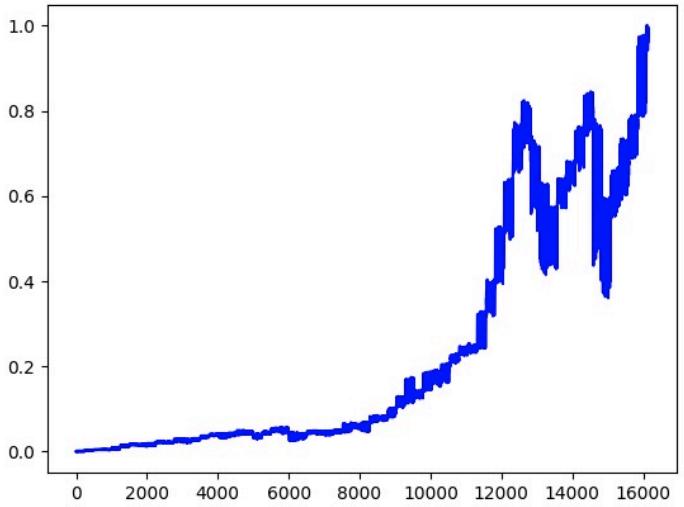
Antara Deep Learning yang terkenal / selalu digunakan

- Multilayer Perceptron (MLP) – bentuk deep learning yang paling mudah

- Convolutional Neural Network – Neural Network / Deep Learning yang digunakan untuk proses gambar

- Recurrent Neural Network – Neural Network / Deep Learning yang digunakan untuk data yang mempunyai kebergantungan terhadap masa

- Generative Adversarial Network – Deep Learning untuk menghasilkan gambar / maklumat baru yang tak pernah wujud berdasarkan data / gambar yang diberikan (Ia cuba menghasilkan sesuatu yang baru, kombinasi dari data sedia ada)


1.0
0.8
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0.2
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0
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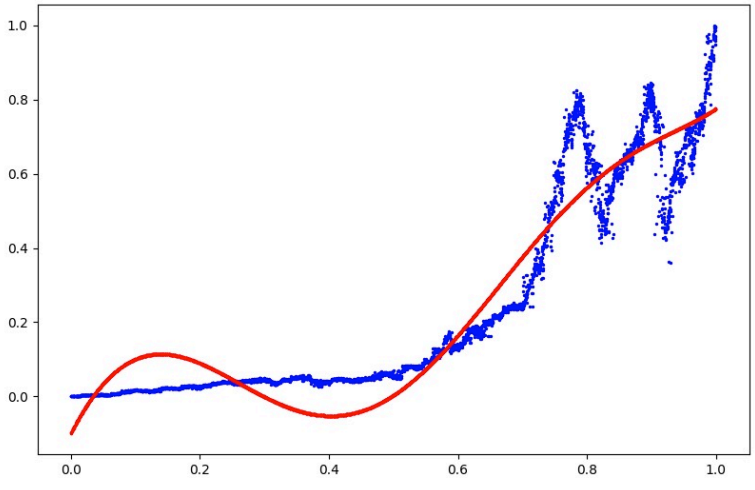
4000
6000
8000
10000
12000
14000
16000


1.0
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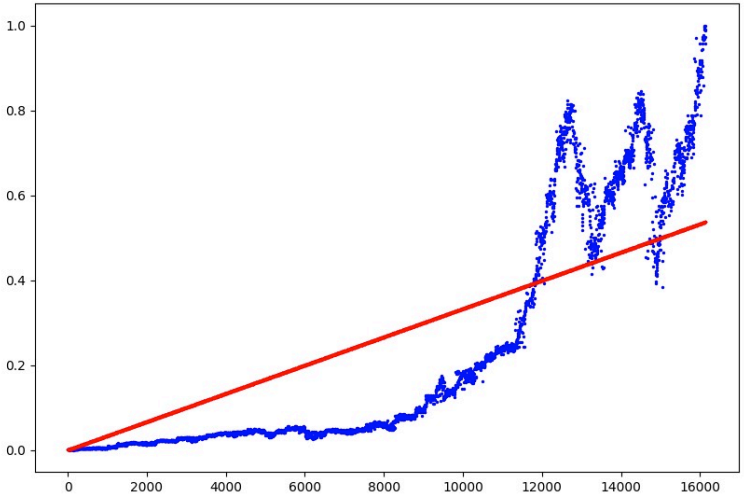
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0


1.0
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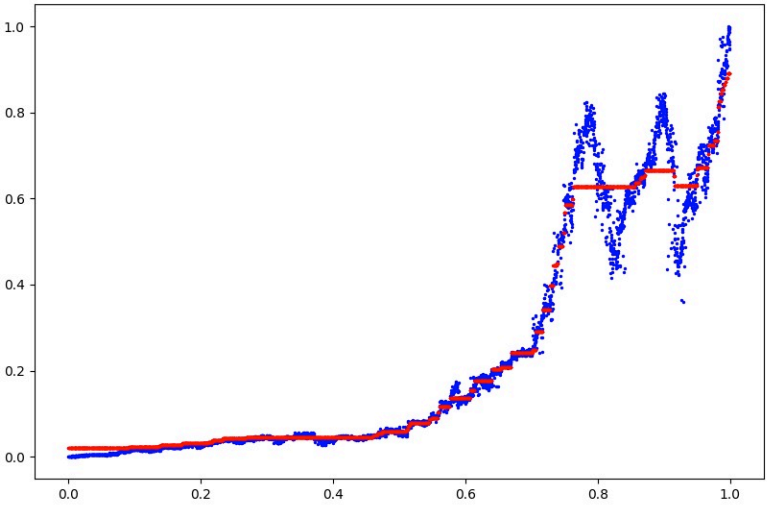
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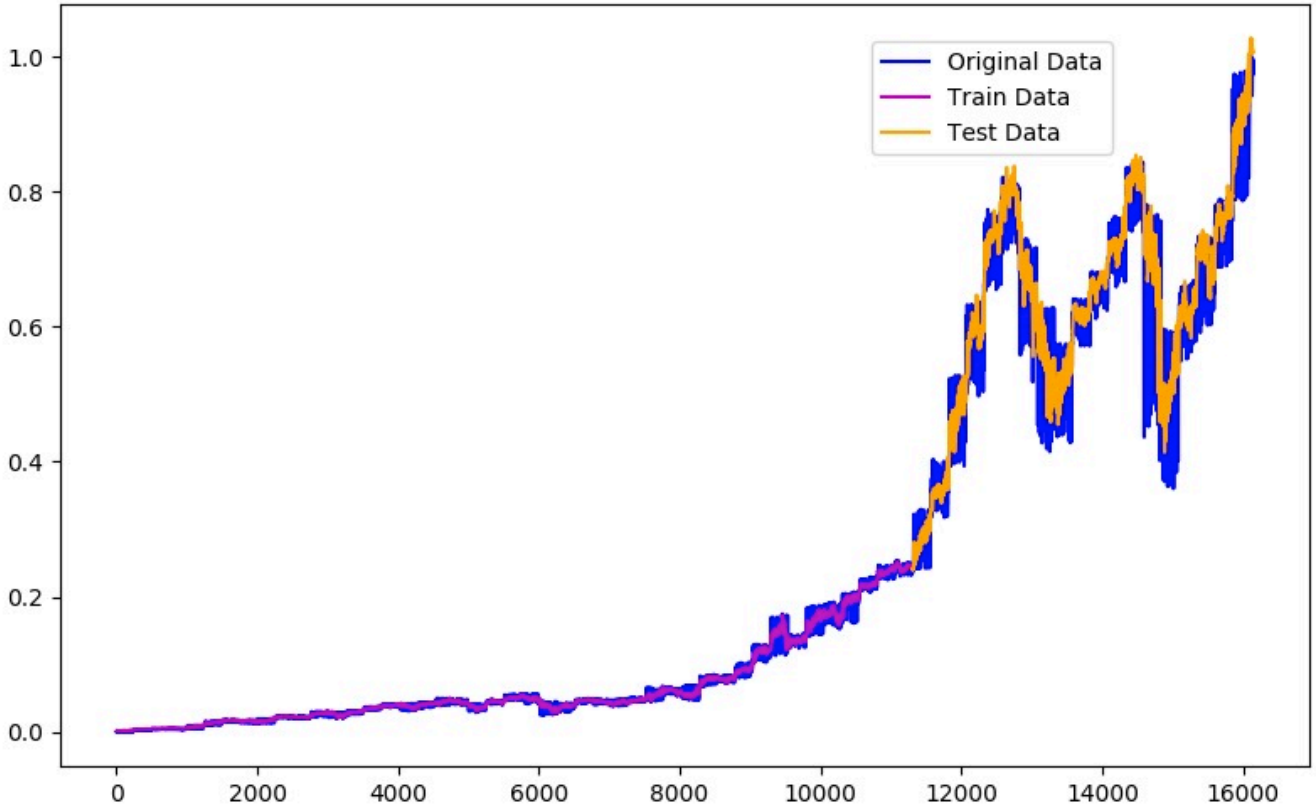


```
MSE - Mean Square Error, the lower the better
==============================================
LSTM MSE : 0.00172
Gradient Boosted MSE : 0.00199
SVM MSE : 0.00751
Linear Regression MSE : 0.02647
```

Demo Neural Network

Terima Kasih