AI , Machine Learning & Deep Learning

AI

- A computer system able to perform tasks that normally require human intelligence
- Machine learning and Deep Learning included under umbrella of AI

Machine Learning

- "field of study that gives computers the ability to learn without being explicitly programmed." Machine-learning programs, in a sense, adjust themselves in response to the data they're exposed to.

<u>Deep Learning</u>

- Deep learning is a subset of machine learning. Usually, when people use the term deep learning, they are referring to deep artificial neural networks

- Deep is a technical term. It refers to the number of layers in a neural network.

- Deep artificial neural networks are a set of algorithms that have set new records in accuracy for many important problems, such as image recognition, sound recognition, recommender systems, etc. For example, deep learning is part of DeepMind's well-known AlphaGo algorithm

Neural Network

input layer

hidden layer 1   hidden layer 2

output layer
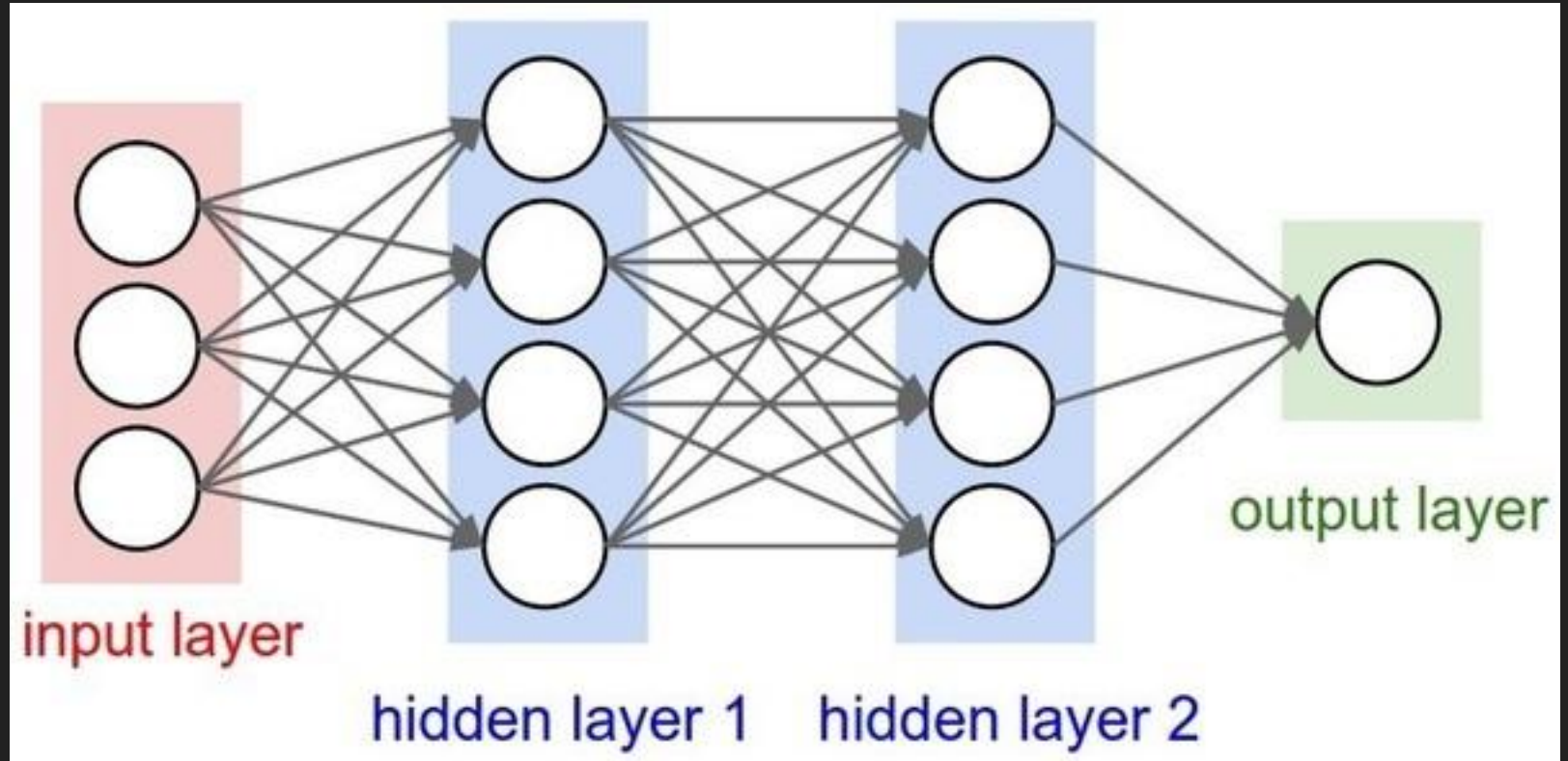
Major Categories of Machine Learning

Supervised - Prediction based on labelled data

- Classification (sentiment analysis)
- Regression (stock prediction)

Unsupervised Machine Learning - Find similarities in unlabeled data
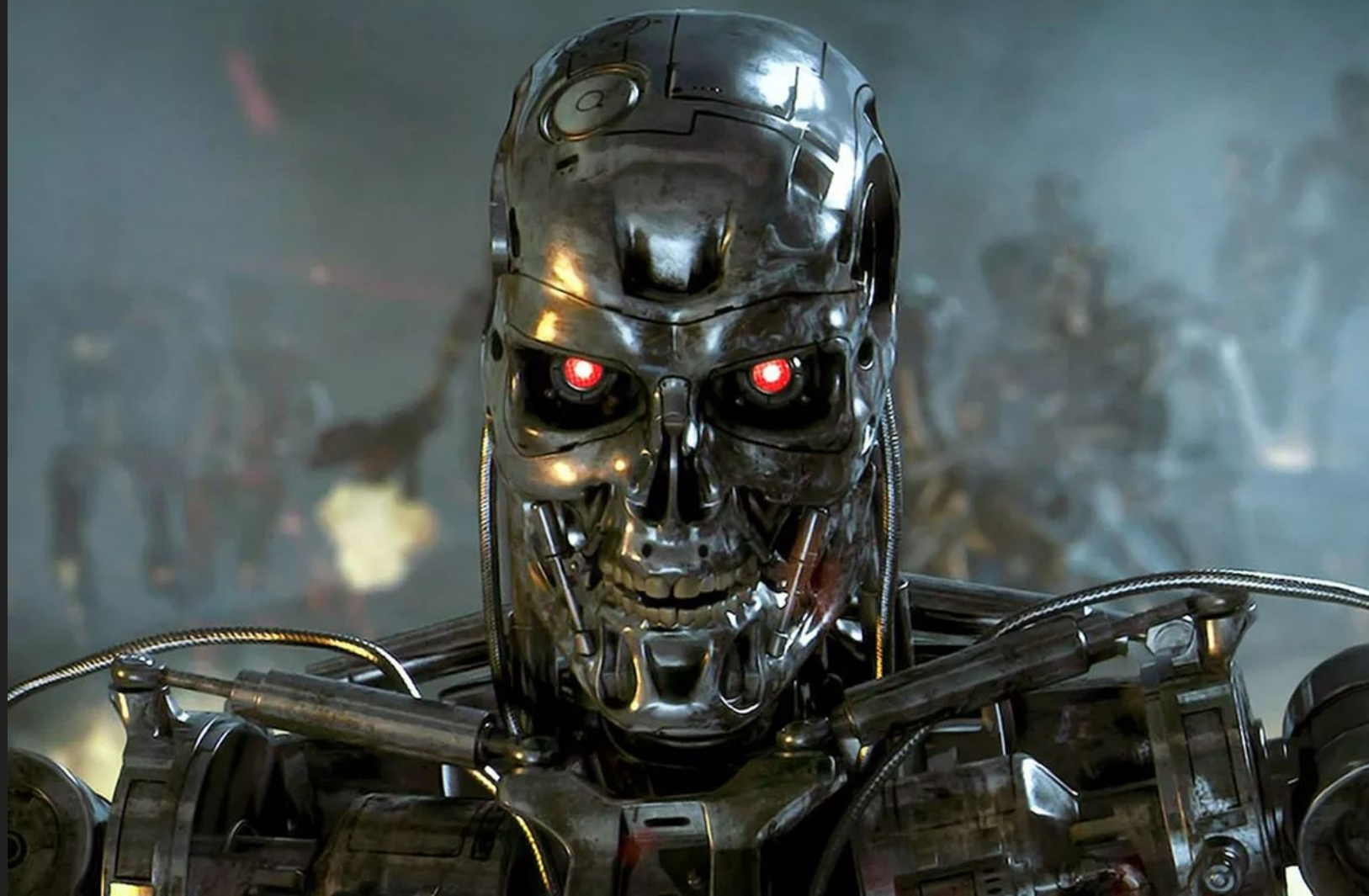
- Grouping of similar data (clustering)
- Outlier Detection

Reinforcement Learning

- Behavior changes based on rewards provided

Where are we now?

In terms of AI ??

Reinforcement Learning

January 25, 2019

DeepMind's new AI just beat top human pro-gamers at Starcraft II for the first time

Open

GANs

GANs

https://youtu.be/PCBTZh41Ris

How do you build a Machine Learning Model

1. Collect data
2. Clean data
3. Label data
4. Choose Suitable algorithm
5. Train model
6. Test
7. Repeat (until obtain satisfying accuracy)

Example of a Machine Learning Algorithm

Naive Bayes Algorithm - Basically an algorithm used for statistics

$$p(C_k \mid \mathbf{x}) = \frac{p(C_k)\, p(\mathbf{x} \mid C_k)}{p(\mathbf{x})}$$

Open

```python
from textblob import TextBlob
```

```python
testimonialpos = TextBlob("This movie was great would watch it again")
testimonialpos.sentiment
```

```
Sentiment(polarity=0.8, subjectivity=0.75)
```

```python
testimonialneg = TextBlob("This movie was terrible would not watch again")
testimonialneg.sentiment
```

```
Sentiment(polarity=-1.0, subjectivity=1.0)
```

```python
testimonialmly= TextBlob("Saya pergi ke rumah nenek semalam")
testimonialmly.sentiment
```

Sentiment(polarity=0.0, subjectivity=0.0)

```python
testimonialweird = TextBlob("aslkncowencdjskjbvwejjb")
testimonialweird.sentiment
```

Sentiment(polarity=0.0, subjectivity=0.0)

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Machine Learning Tools

- Python / R

- Anaconda
    - Jupyter notebook

- Scikit Learn

Deep Learning Tools

- Google TensorFlow
- PyTorch
- Keras
- Caffe

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Resources

Cognitive Class - Free
https://cognitiveclass.ai/

Kaggle (Dataset & Examples Source)
www.kaggle.com

Rapid Experimentation
- Start Googling
- Test codes