

disajikan dalam
Jalur 1 ▪ Jalur 2

Pengantar Deep Learning

Apa yang akan kita bahas dalam modul ini

- Perbedaan antara AI, machine learning, dan deep learning
- Bagaimana machine learning bekerja
- Apa itu jaringan saraf tiruan (neural network)
- Tantangan dalam machine learning dan deep learning

Mari kita bahas secara teknis!



Jangan stres.



Jika ini pertama kalinya Anda mempelajari detail teknis, gunakan ini sebagai cara **untuk mengenal** istilah & konsep.



Jika Anda sudah mengetahui beberapa detail ini, gunakan ini sebagai cara untuk **memperjelas** pemahaman Anda.

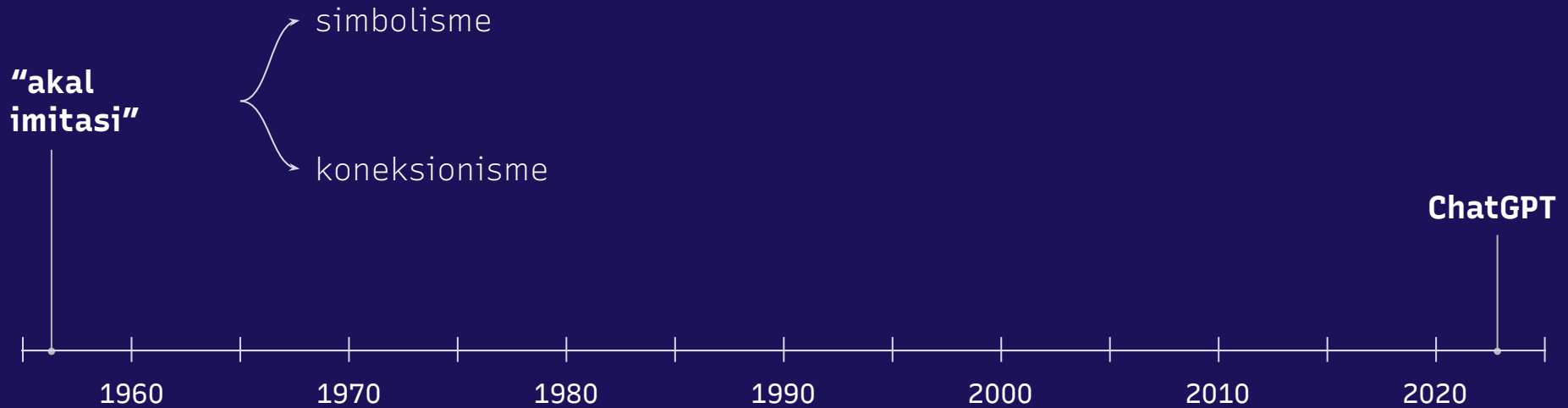


Anggap slide deck ini sebagai **sumber daya**. Kembali merujuk padanya sesuai kebutuhan!

deep learning

VISION
Sistem berbasis
aturan

VISION
Big data, sistem
komputasi besar



Para “simbolis”

TEORI

Kita cerdas karena kita memiliki pengetahuan

RENCANA

Bangun sistem pakar dengan basis data pengetahuan

Para “koneksionis”

TEORI

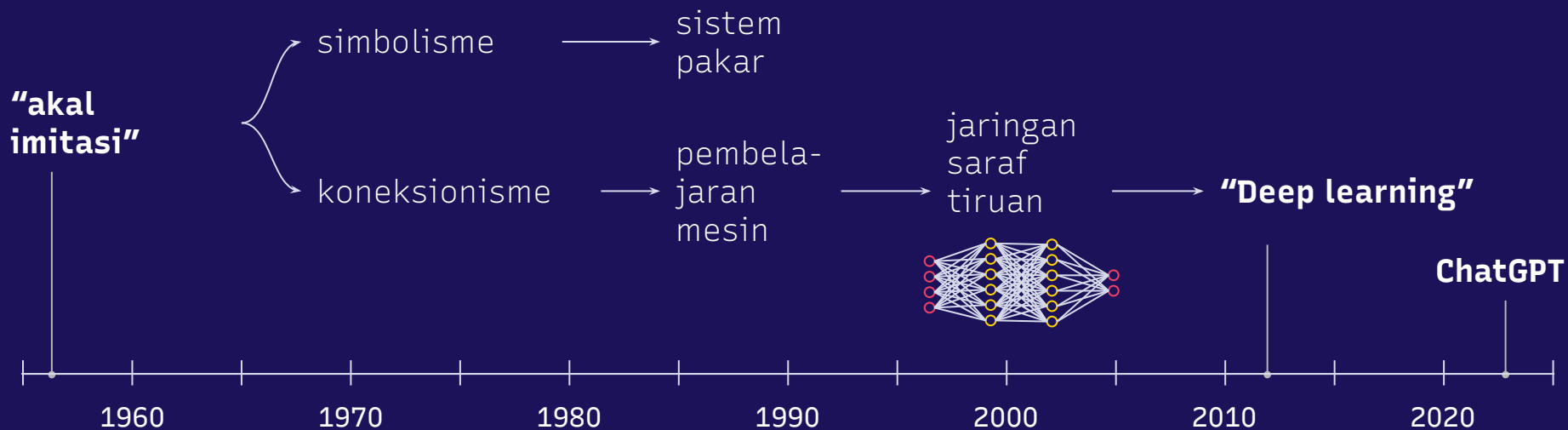
Kita cerdas karena kita bisa belajar

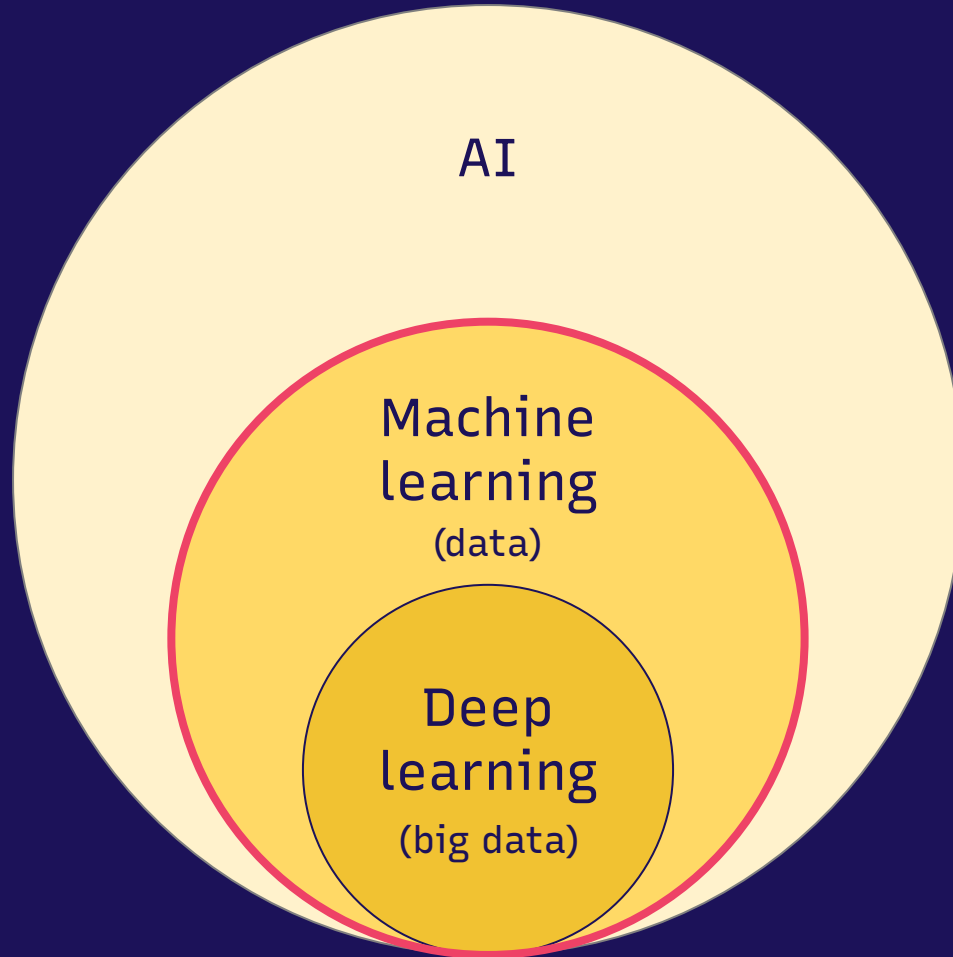
RENCANA

Bangun perangkat lunak pembelajaran mesin yang bisa belajar dari data

VISION
Sistem berbasis
aturan

VISION
Big data, sistem
komputasi besar





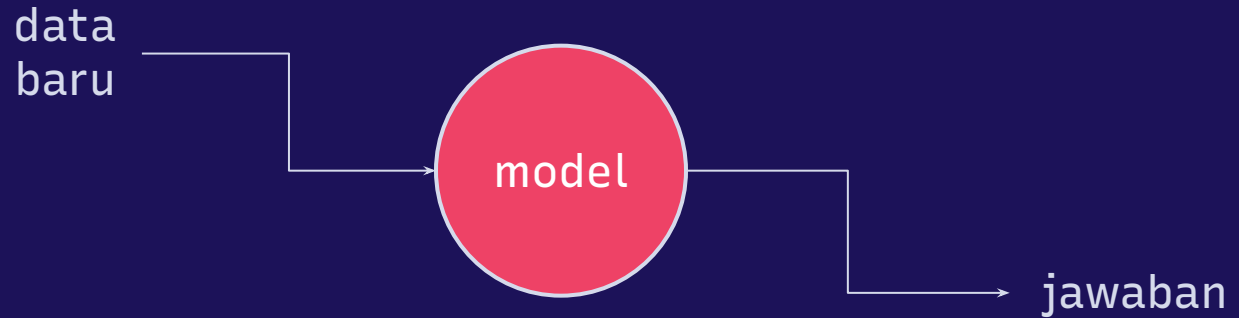
Machine learning vs. deep learning di dunia nyata

- Banyak algoritma yang dipakai pemerintah akan menggunakan machine learning / pembelajaran mesin, misalnya prediksi kejahatan, distribusi manfaat. Sementara, Banyak produk dan layanan Big Tech akan menggunakan deep learning / pembelajaran mendalam, misalnya penargetan iklan, rekomendasi.
- Banyak perangkat lunak AI yang dibangun menggunakan data multimedia (gambar, audio, video) juga akan menggunakan deep learning / pembelajaran mendalam, misalnya pengenalan wajah dan suara.

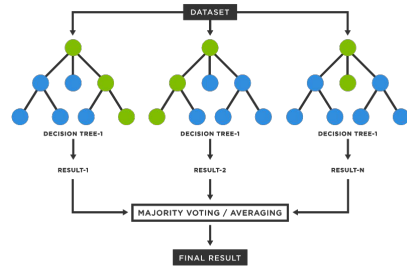
PELATIHAN



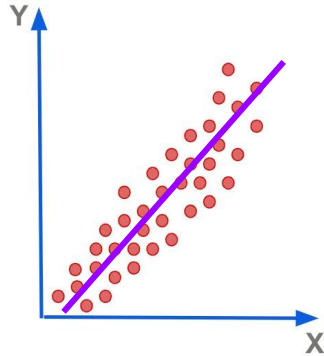
INFERENSI



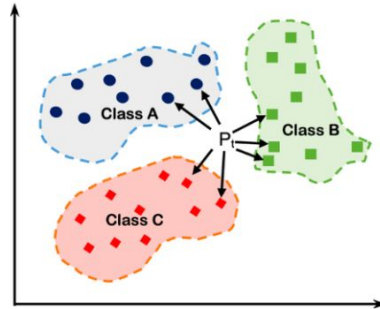
Machine Learning Deep Learning



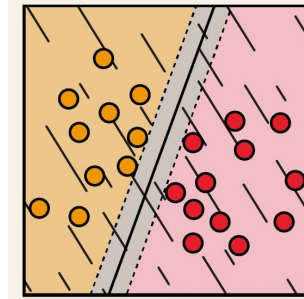
Hutan acak



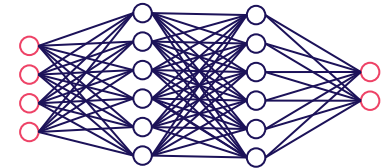
Statistik yang lebih canggih



K nearest neighbor



Mesin vektor pendukung



Jaringan saraf tiruan

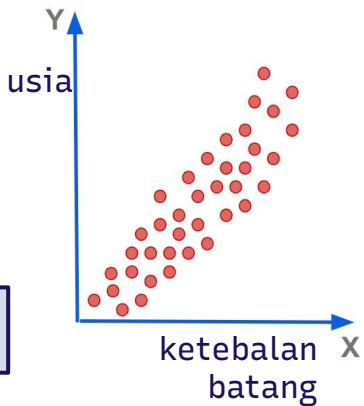
Statistik yang lebih sederhana

Statistik yang lebih canggih

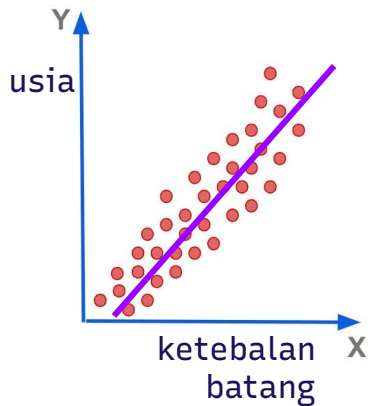


PELATIHAN

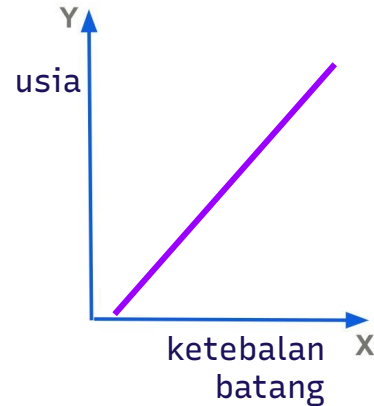
Data



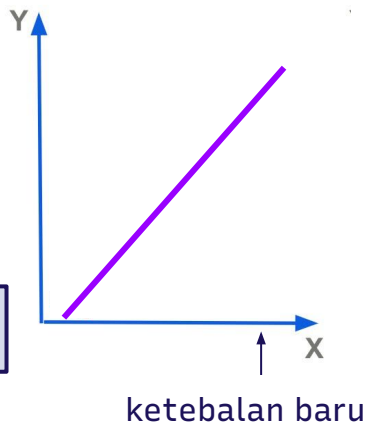
Algoritma ML



Model

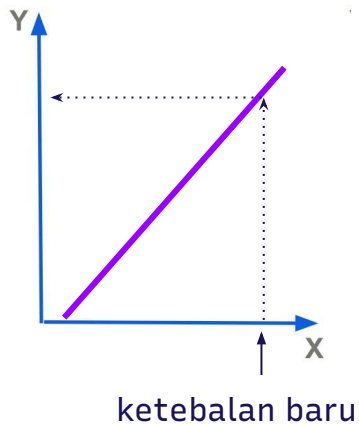


Data baru

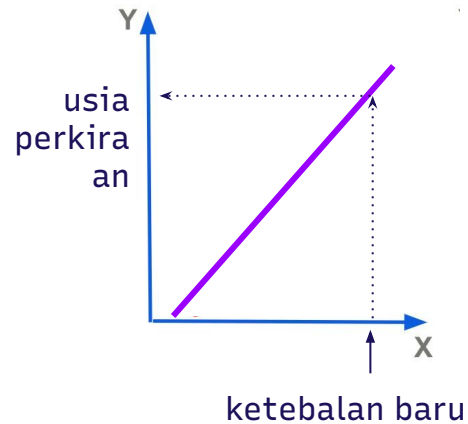


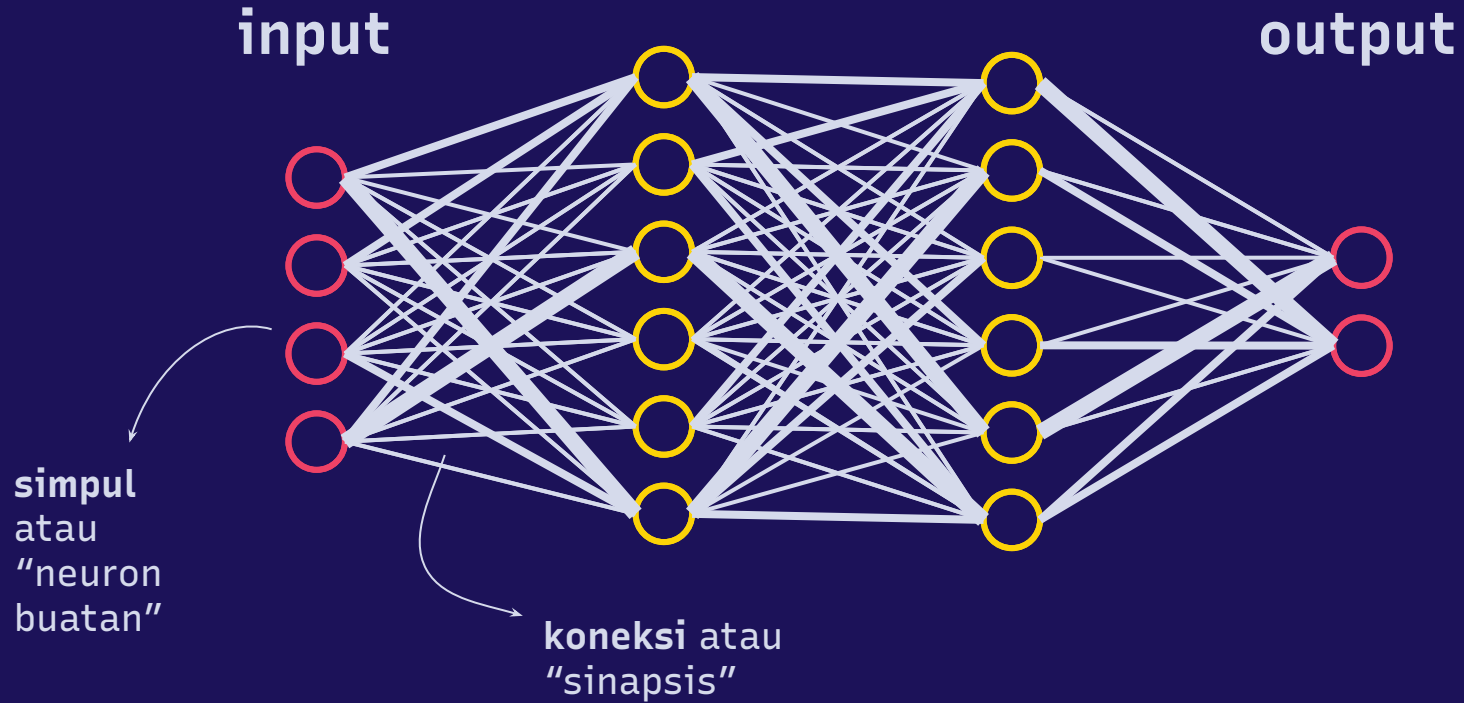
INFERENSI

Model



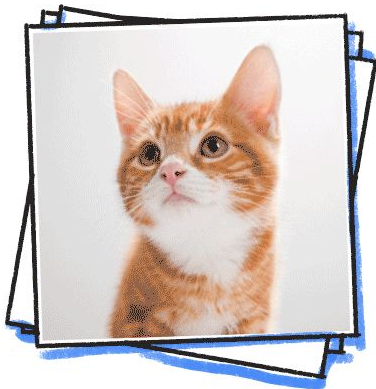
Jawaban





Data

CAT



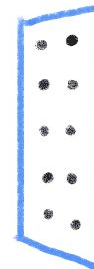
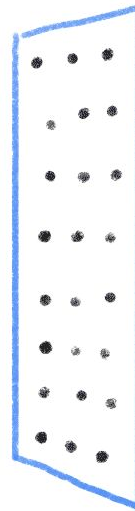
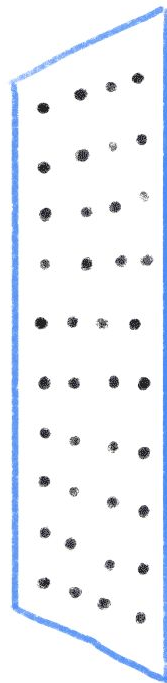
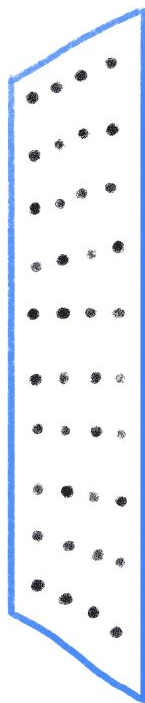
(LABELED
PHOTOS)

DOG



PELATIHAN

Algoritma ML

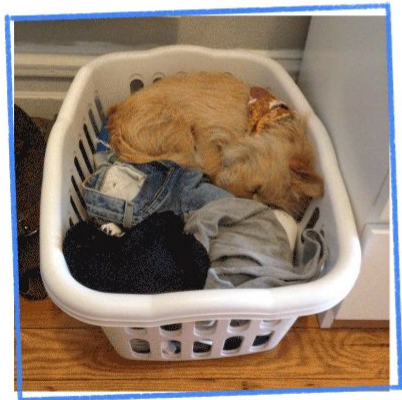


Model

OUTPUT

Data baru

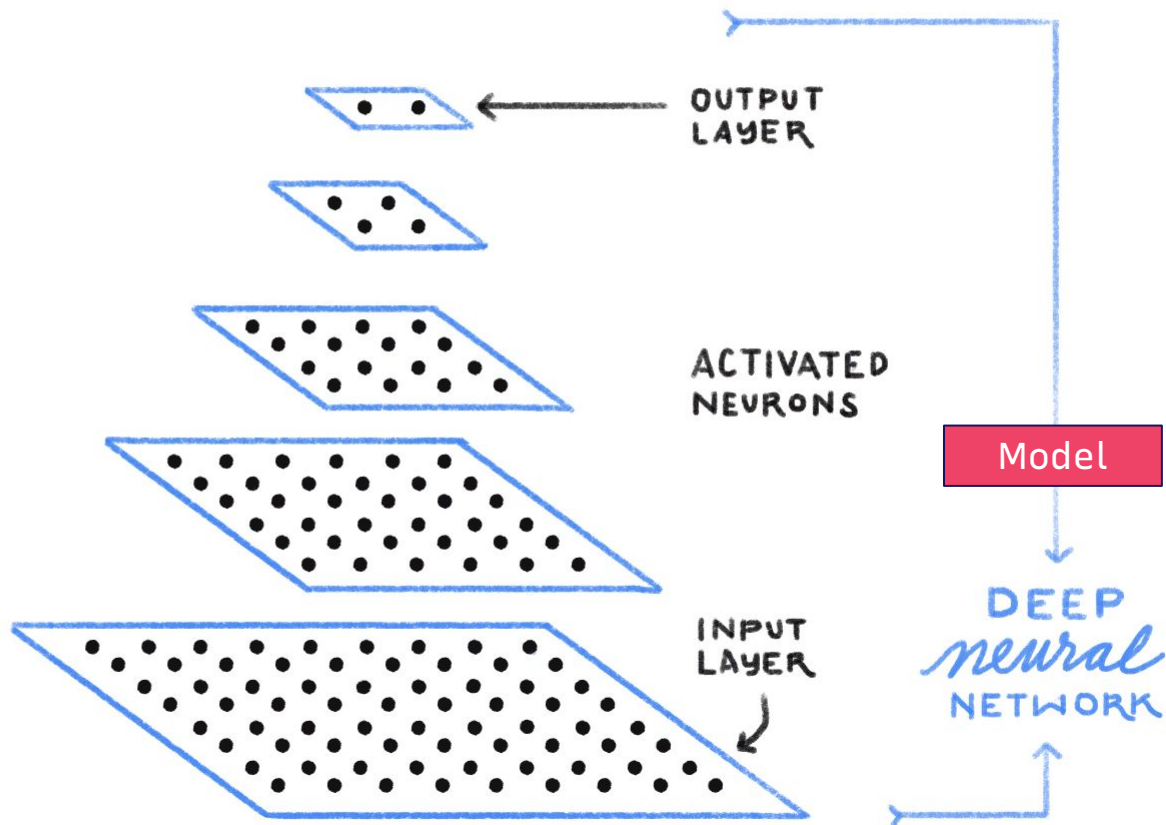
IS THIS A
CAT or DOG?

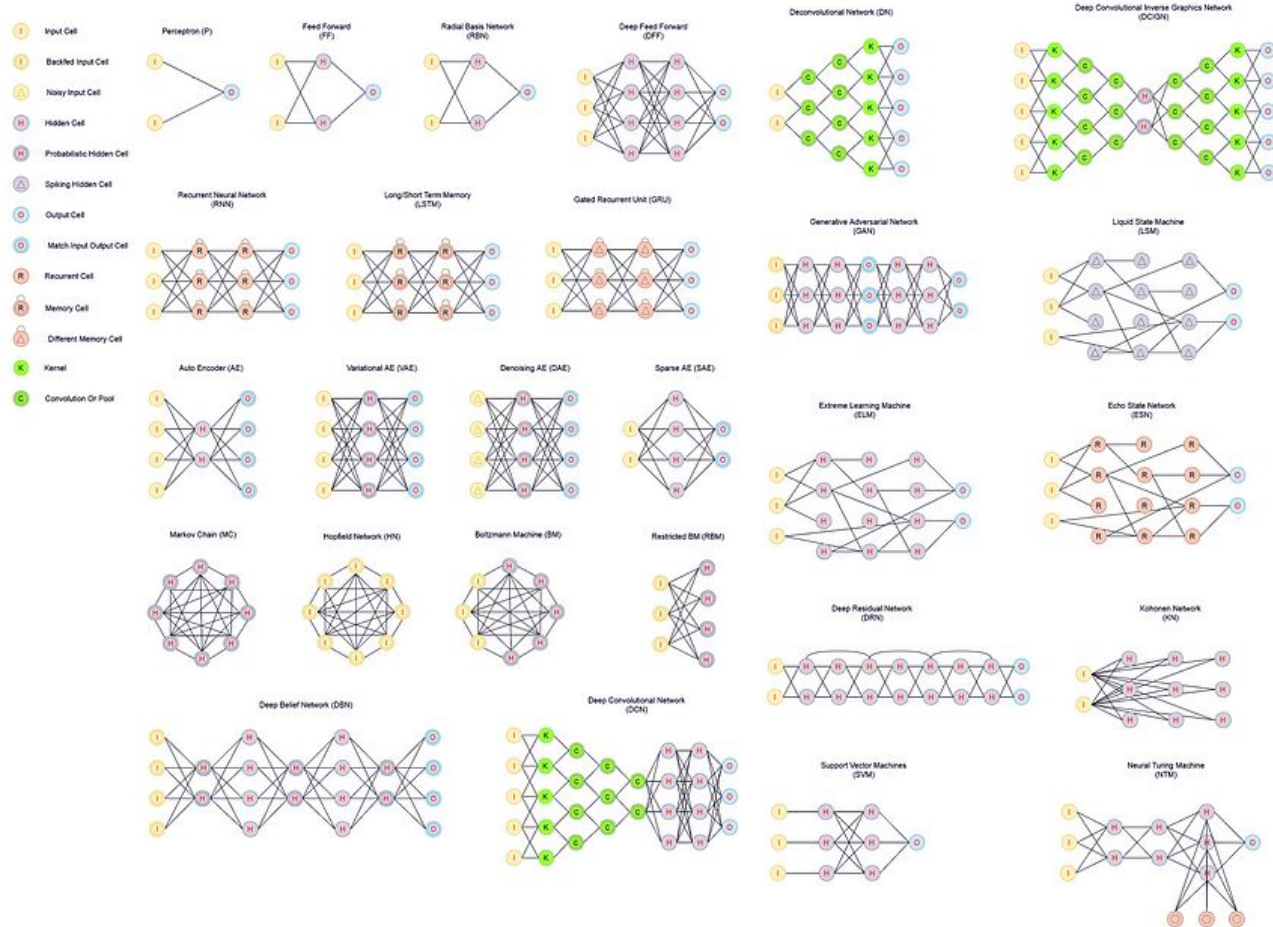


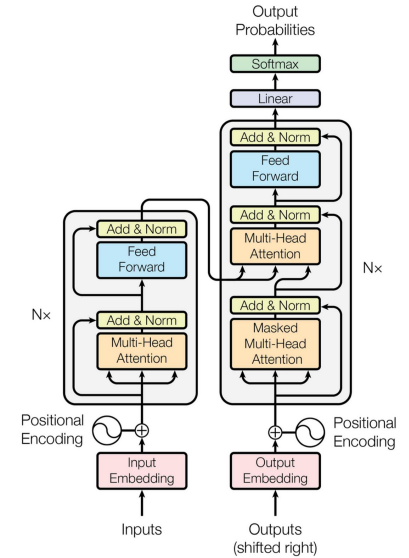
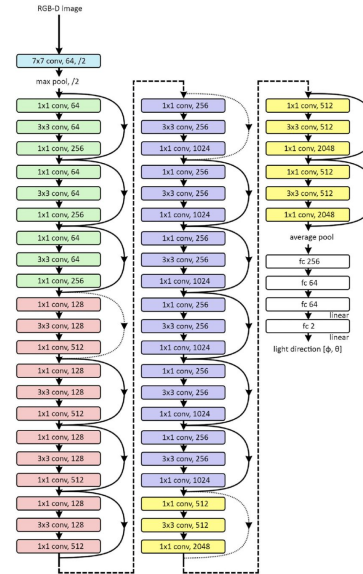
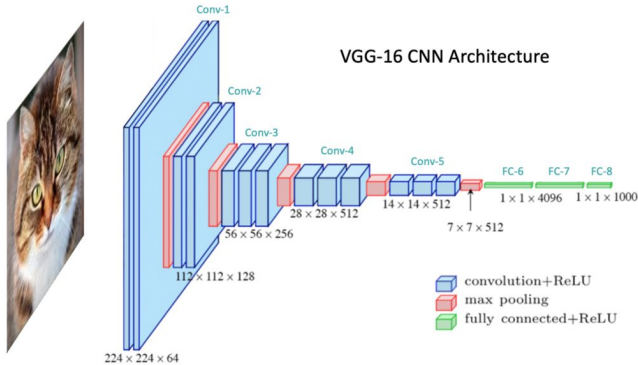
INFERENSI

CAT DOG

Jawaban







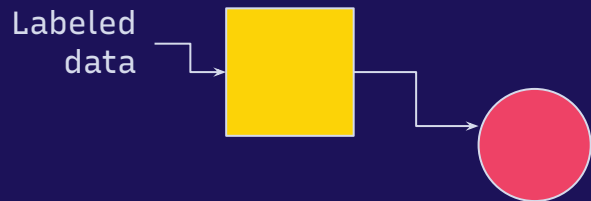
**Jaringan saraf
konvolusional (CNN)**

**Jaringan saraf
rekurens (RNN)**

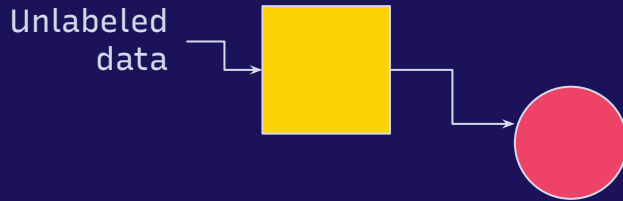
Transformer

Deep Supervised learning

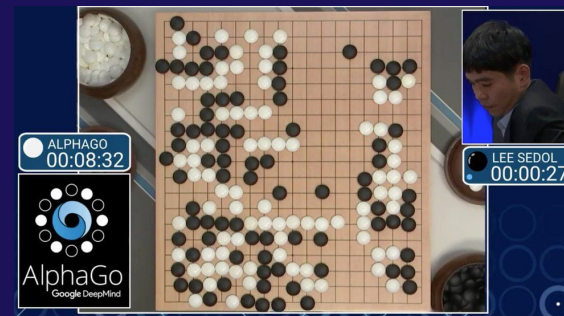
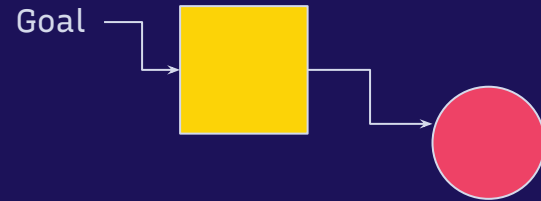
(semi-
supervised)



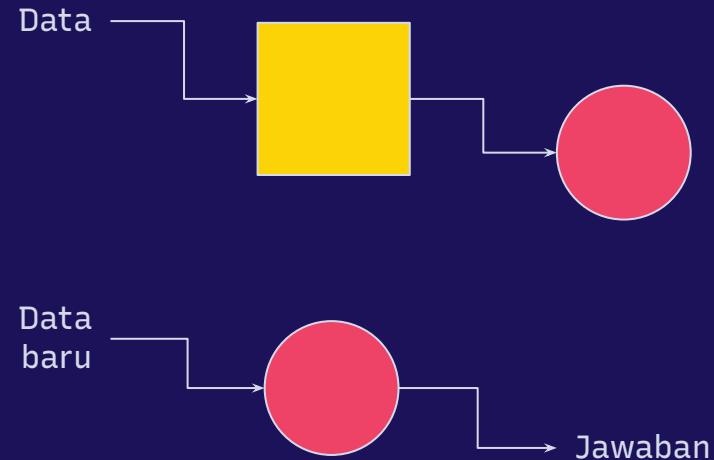
Deep Unsupervised learning



Deep Reinforcement learning



Kesederhanaan
machine learning lah
yang membuatnya
begitu powerful.



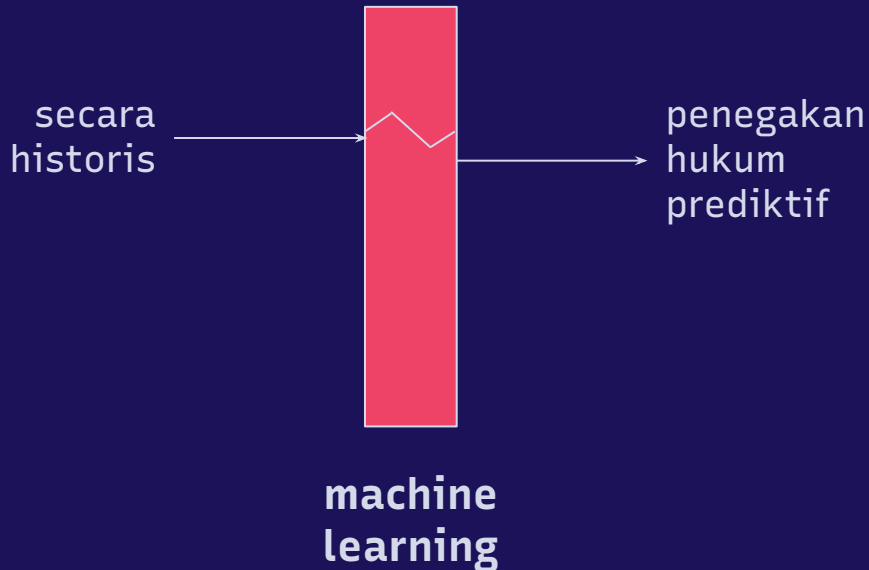
Anda dapat
mengubah
data apa
pun



machine learning

...menjadi
model

Ini juga akar
dari banyak
masalah.



Hal ini menjadi lebih rumit dengan jaringan saraf tiruan.

The New York Times

Self-Driving Uber Car Kills Pedestrian in Arizona, Where Robots Roam



Share full article



1.9K



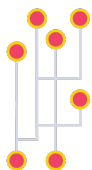
A woman crossing Mill Avenue at its intersection with Curry Road in Tempe, Ariz., on Monday. A pedestrian was struck and killed by a self-driving Uber vehicle at the intersection a night earlier. Caitlin O'Hara for The New York Times

By **Daisuke Wakabayashi**

March 19, 2018



AI Spotlight Series



**The AI
Accountability
Network**



Pulitzer Center