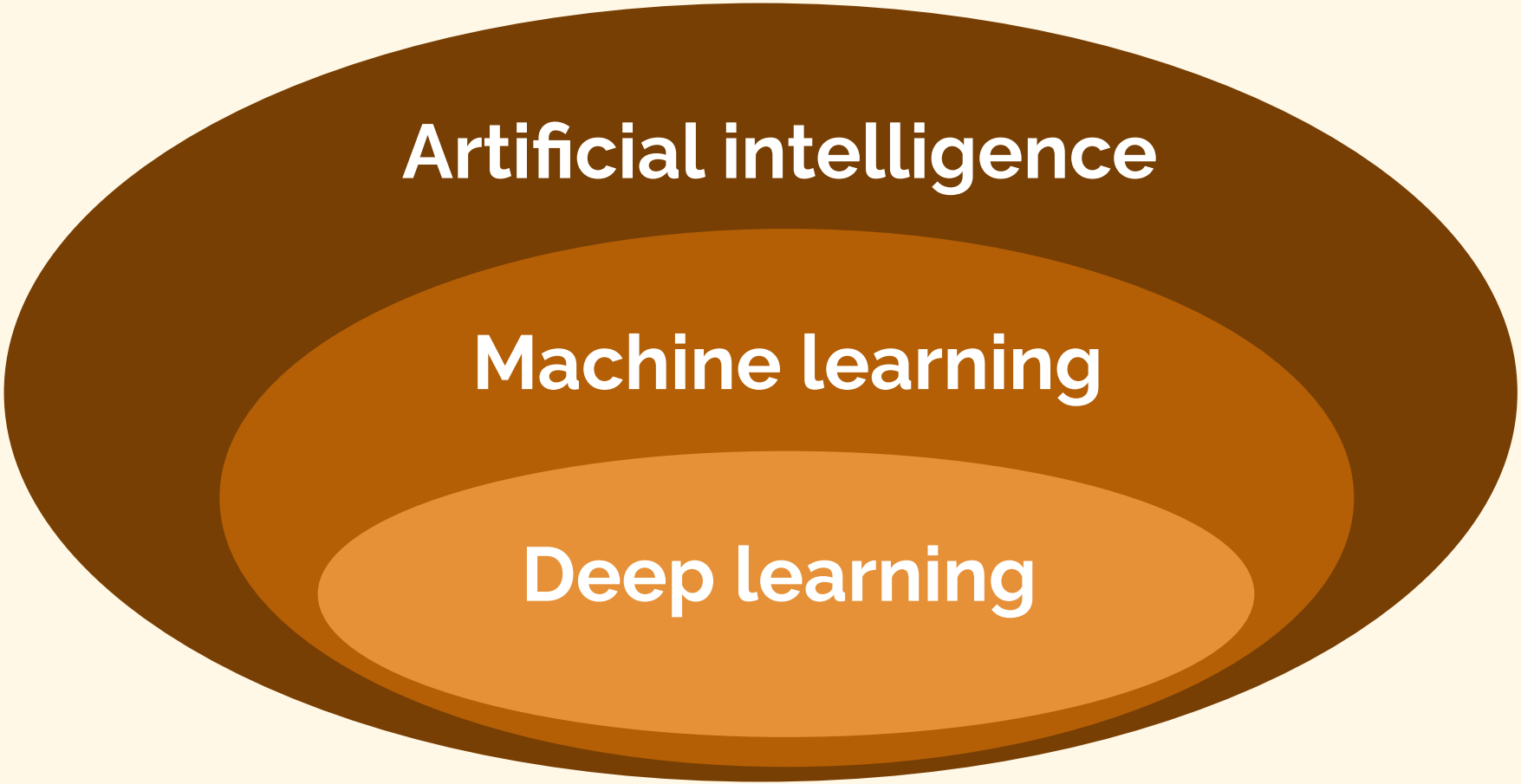
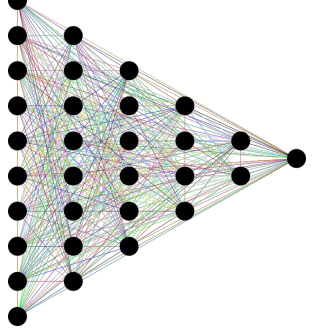
What is Deep Learning?


Artificial intelligence
Machine learning
Deep learning

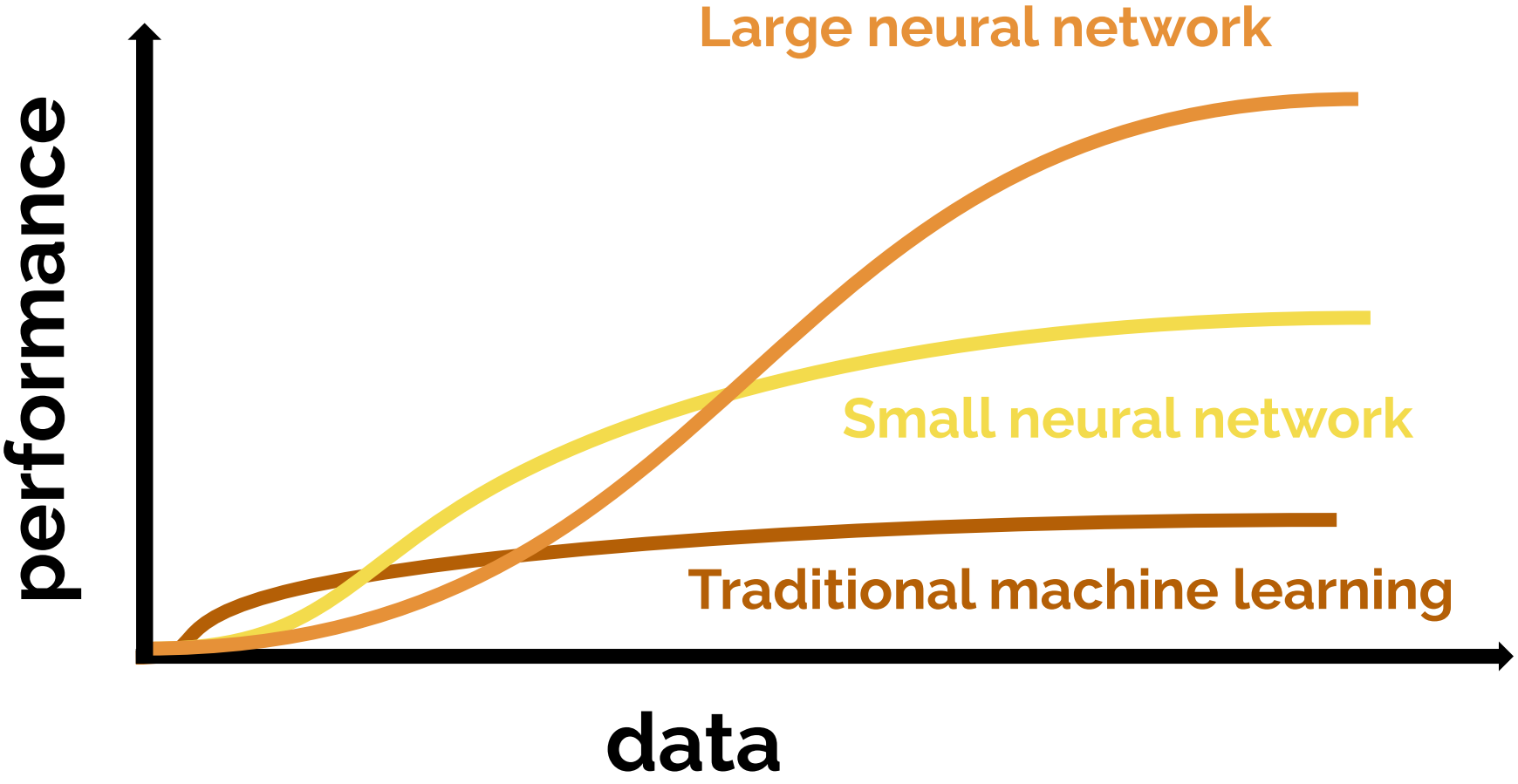
What is “deep”?



- **Circuits are typically organized in many *layers***
  - *Computation paths from inputs to outputs have many steps*

Rise of deep learning

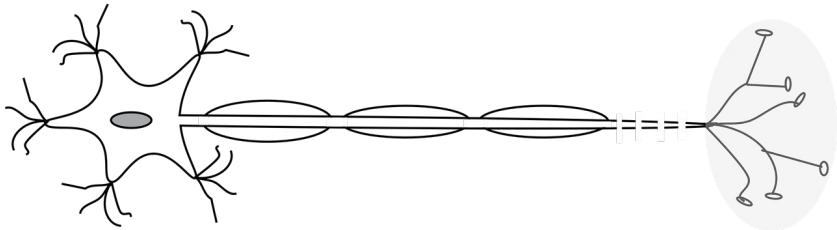
- Data availability
- Compute resources
- Algorithmic innovation


Large neural network
Small neural network
Traditional machine learning
performance
data

How do you improve performance?

- Increase training data
- Increase neural network size

Deep learning structure

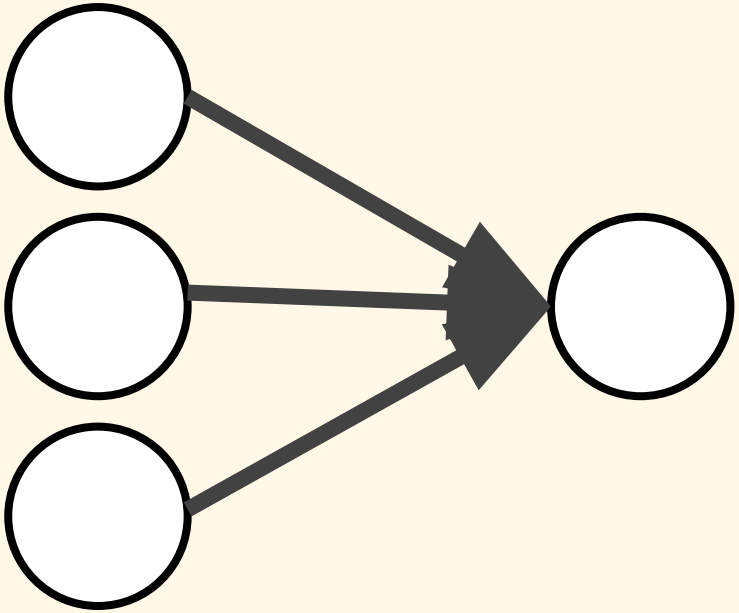


- Multi layered structure called neural networks

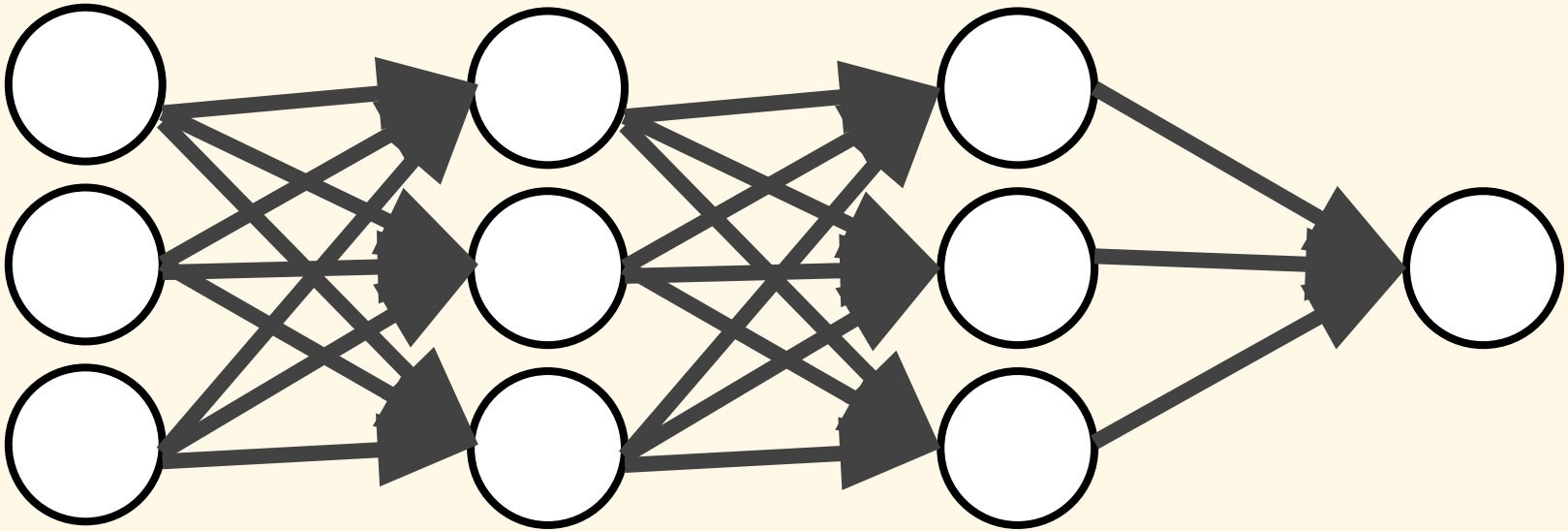
What is the basic idea of deep learning?

- **Train circuits with long computation paths**
  - Allows all input variables to interact in complex ways
  - Each variable can interact with all others

Shallow model



Deep learning model



Coming up...

What is a Neural Network?