Tutorial: Deep Reinforcement Learning

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Outline

Reinforcement Learning in a nutshell

RL is a general-purpose framework for decision-making

- RL is for an agent with the capacity to act
- Each action influences the agents future state
- Success is measured by a scalar reward signal
- Goal: select actions to maximise future reward

Reinforcement Learning in a nutshell

DL is a general-purpose framework for representation learning

- Given an objective
- Learn representation that is required to achieve objective
- Directly from raw inputs
- Using minimal domain knowledge

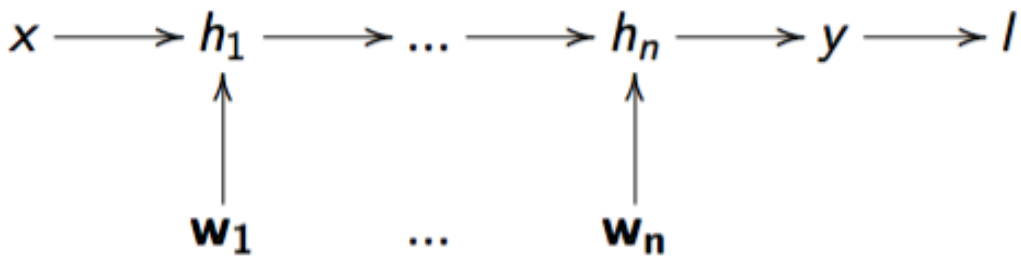
Deep Reinforcement Learning: AI = RL + DL

We seek a single agent which can solve any human-level task

- RL defines the objective
- DL gives the mechanism
- RL + DL = general intelligence

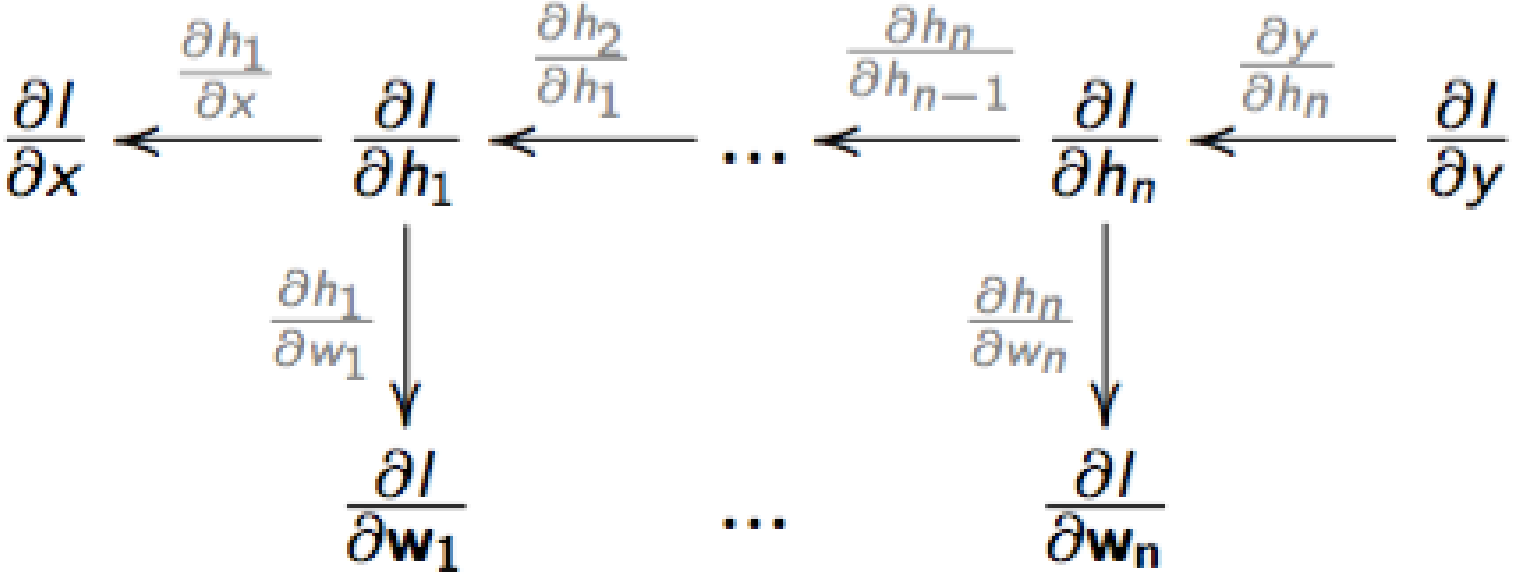
Deep Representations

- A deep representation is a composition of many functions



Deep Representations

- Its gradient can be backpropagated by the chain rule



(0,0) .. controls (6,1) and (9,1) .. node[near start,sloped,above] near start node midway node[very near end,sloped,below] very near end (12,0);