Acknowledgments: Many thanks to R. Sutton and A. Barto for making their figures and slides available online. Also many thanks to P. Dayan and L. Abbott for making the figures of their book available online.
A Taxonomy of Learning Settings

- Unsupervised
- Self-supervised
- Reinforcement
- Imitation
- Instruction
- Supervised

Increasing amount of “help” from the environment
Resources

Dayan & Abbott

Sutton & Barto
Requirements

• class participation:
  • come to class
  • ask and answer questions

• do the posted readings:
  • required vs. optional ones

• homeworks:
  • as posted on the course web page
  • some include programming in Matlab or Python
Background

• You should have:
  ‣ good knowledge of probability and statistics
  ‣ good knowledge of linear algebra

• But don't need to be an expert in:
  ‣ Machine Learning
  ‣ Artificial Intelligence
  ‣ Neuroscience
  ‣ Control Theory
Motivation for Neuroscientists

David Marr (1982):

“Trying to understand perception [the brain’s operation] by studying only neurons is like trying to understand bird flight by studying only feathers: it just cannot be done. In order to understand bird flight, we have to understand aerodynamics; only then do the structure of the feathers and the different shapes of birds’ wings make sense.”
Motivation for Machine Learners

In many domains, the human brain is still far superior to current day computers and robots. Studying the brain's solution to “intelligence” can provide important clues for how to build smarter machines.