AI Summary

CPSC 433: Artificial Intelligence
Fall 2024

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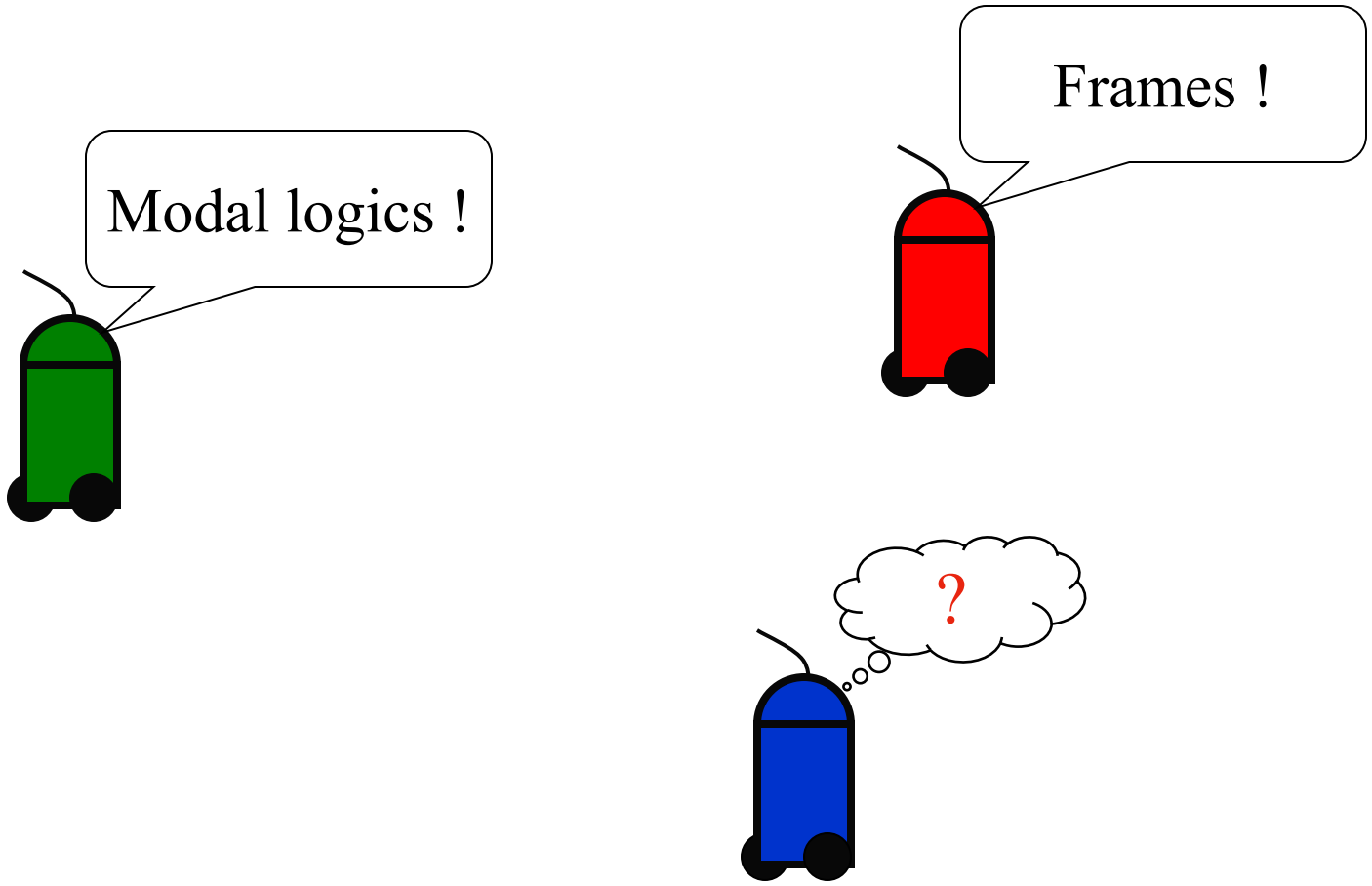
Picking Knowledge Representation

What to use?



Rules of thumb

- Theoretical investigations: what is possible?
  ☞ Logics
- Knowledge already in very similar format
  ☞ take format
- Hierarchical structures / inheritance
  ☞ semantic nets, frames
- Represent certain input-output behavior
  ☞ neural nets
- Laws, rules
  ☞ rule sets

Machine Learning

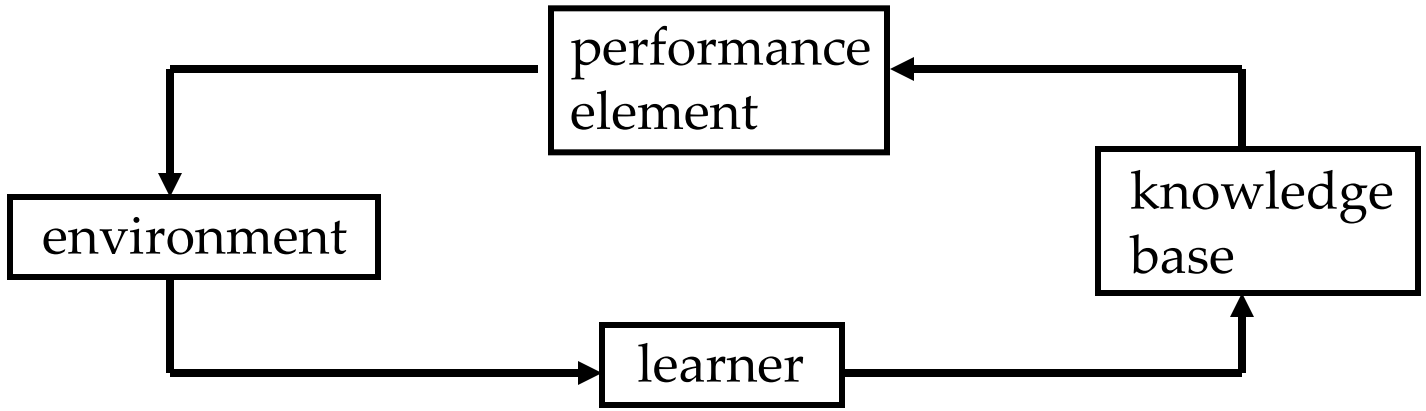
Learning

In general:

Structuring (or restructuring) of knowledge (due to experiences)

In AI systems:

Restructuring in order to improve behavior of system



General Questions/Problems

Learning Phase:

- How to represent and store the learned knowledge?
- What or whom to learn from?
- What learning method to use?

Application Phase

- How to detect applicable knowledge?
- How to apply knowledge?
- How to detect and deal with misleading knowledge?

General questions

- How to generalize, resp. detect and define similarities
- How to combine knowledge from different sources?

What or whom to learn from

- Unsupervised learning
  ☞ learn from own experiences
- Supervised learning
  - Teacher(s) provide knowledge
  - Teacher provides evaluation of own experiences
  - Teacher can be observed

But what is a teacher? Only a human, another computer program, nature, etc.?

What learning method to use

- Learning by heart
  (of prototypical cases)
- Decision-tree based learning (ID3, C4.5)
- Reinforcement learning
- Evolutionary methods, like
  - Classifier systems
- Neural Networks
- ...

Other courses

Where to go from here?

Several different subareas of AI requiring whole course (or more) on their own.

- CPSC 544: Machine Learning (usual follow-up course)
- CPSC 565: Emergent Computing (as long as Dr. Christian Jacob around)
- CPSC 567: Foundations of Multi-Agent Systems (sunsetting)
- CPSC 568: Agent Communications (sunsetting)
- CPSC 599: Deep Learning for Vision (Fall 2024)
- CPSC 599: Natural Language Processing (Winter 2025)
- CPSC 599: Applied AI in Games (Winter 2025)

- Maybe Data Mining, Human Computer Interactions, Biometric Technologies

Onward to …
other AI classes!

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