Knowledge Representation, Reasoning and NetLogo

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Representations
Knowledge Representation

- **Knowledge** is the information about a domain that can be used to solve problems in that domain
- A **knowledge base** is the representation of all of the knowledge that is stored by an agent
Reasoning and acting

Reasoning is the computation required to determine what an agent should do.

- Offline computation is the computation done by the agent before it has to act
Reasoning and acting

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- **Offline computation** is the computation done by the agent before it has to act
- **Background knowledge and data → knowledge base**
Reasoning and acting

Reasoning is the computation required to determine what an agent should do.

- **Offline computation** is the computation done by the agent before it has to act.
- **Background knowledge and data → knowledge base**
- **Online computation** is the computation that’s done by an agent between receiving information and acting.
NetLogo

the Agent Based Modeling (ABM) language
NetLogo is the Agent Based Modeling (ABM) language. It is specifically built for agent-based modeling and offers:

- A modeling environment
- Interactively adjust parameters
- Feedback through plots and visualizations
What is Modeling?

- A simplified mathematical representation of a system
- Only include features essential to explaining phenomenon of interest
### Model Types

- deterministic
- stochastic
- evolving
Deterministic: flocking
Stochastic: network growth
Stochastic: termites
Evolving: genetic algorithms
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- NetLogo is particularly well suited for modeling complex systems that develop over time.
- Using NetLogo you can create programs containing thousands of agents (called “turtles”) all operating independently.
- For us, NetLogo will serve as another programming environment in which to explore the Imperative, Procedural and Object-Oriented Paradigms.
NetLogo

Resources

- Documentation
  http://ccl.northwestern.edu/netlogo/docs/

- Quick Guide
  http://luis.izqui.org/resources/
  NetLogo-5-0-QuickGuide.pdf

- Dictionary (full list of commands and descriptions of them)
  http://ccl.northwestern.edu/netlogo/docs/dictionary.html