

AUTONOMOUS SYSTEMS

SEMINAR 07

AML-based diagrams

Entity diagram

Society diagram

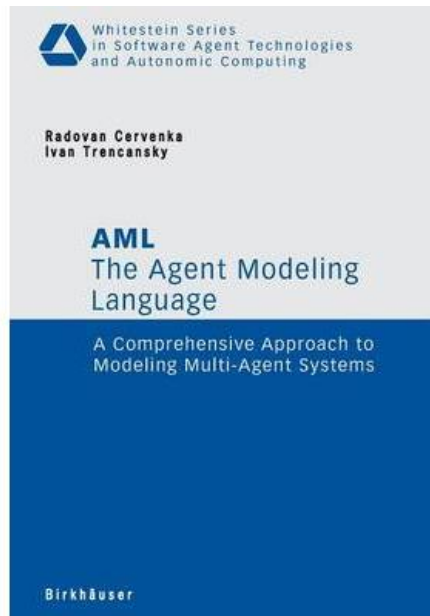
Martina Husáková

How to act in case of the project?

- Phase 1: Topics of projects
- Phase 2: Literature research, state of the art
- Phase 3: Mind mapping
- Phase 4: PEAS, ODD+D
- **Phase 5: MAS conceptualisation**
- Phase 6: Verification and validation

Agent Modelling Language (AML)

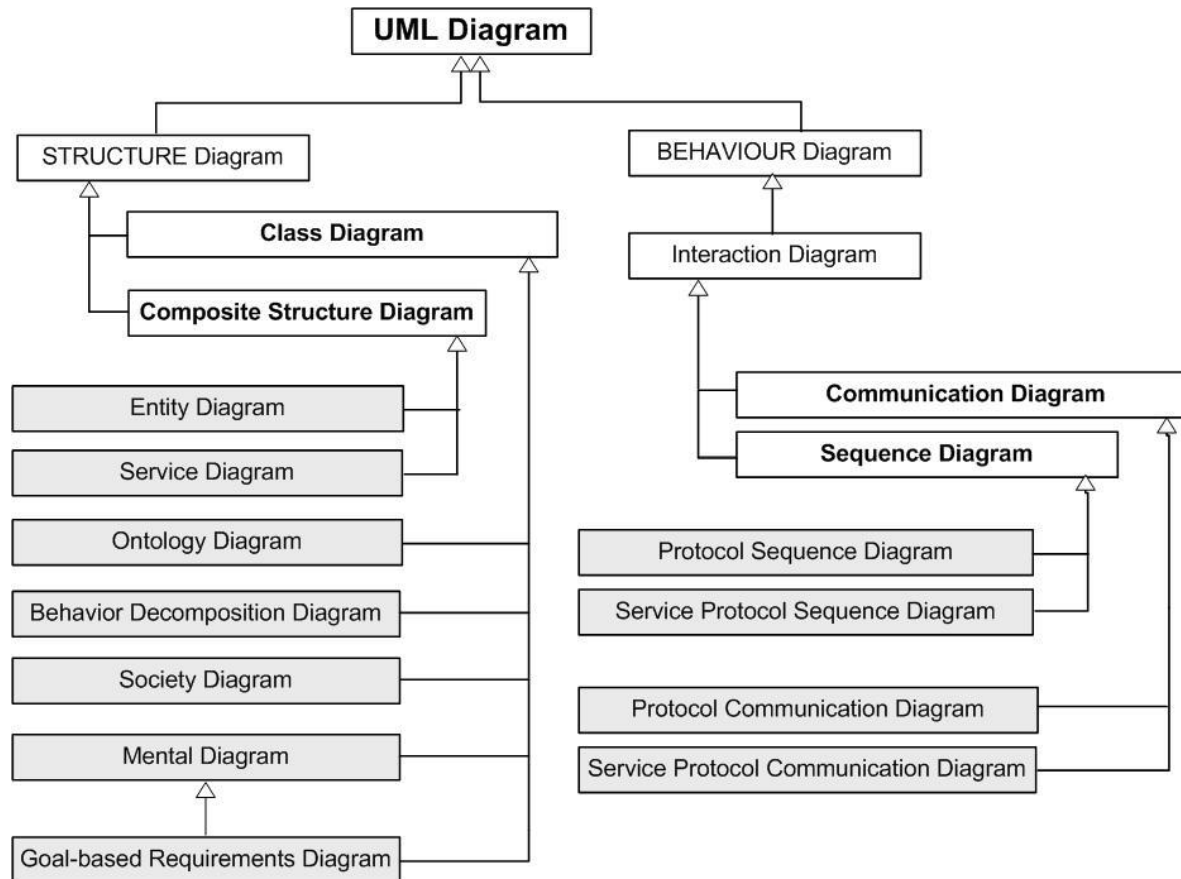
- Conceptual semi-formal language used for analysis and design of multi-agent systems



- AML extends the UML thanks to stereotypes. A stereotype defines a new element with own semantics.
- Extends the UML class diagram, the UML composite structure diagram and UML sequence diagram

Cervenka, R. a Trancansky, I. 2007. *The Agent Modeling Language – AML: A Comprehensive Approach to Modeling Multi-Agent Systems*. Birkhäuser Verlag AG, part of Springer Science+Business Media, 355 p. ISBN 978-3-7643-8395-4.

AML diagrams



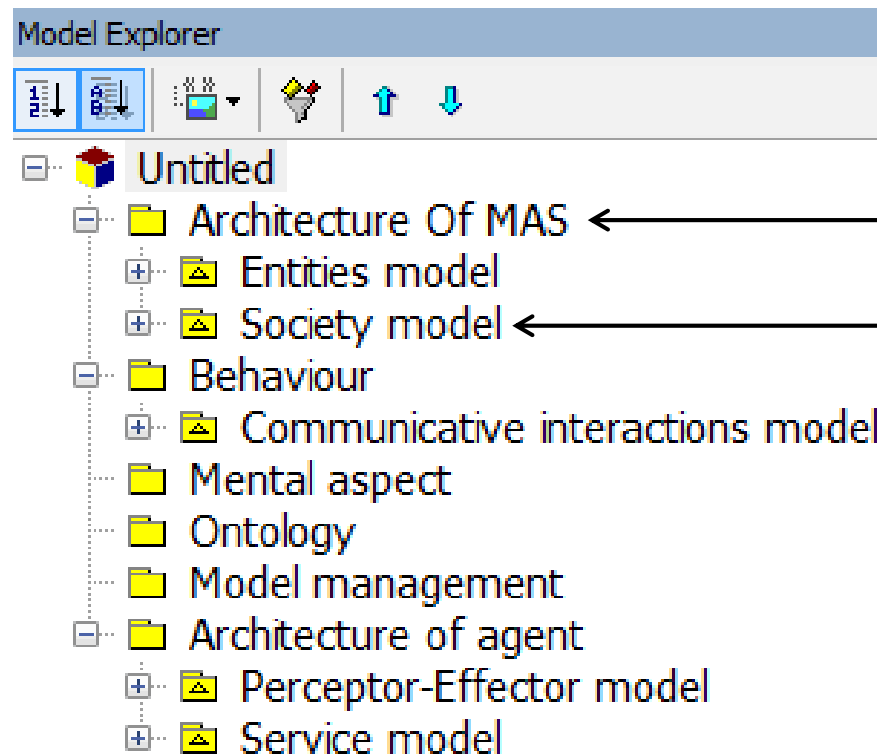
Citation: Husáková, M.: Conceptual Modelling in Computational Immunology. Bruckner Publishing. Academic Series (2015)

Development environment

- StarUML 5.0: Case tool used for analysis and design of multi-agent systems in UML 2.0
- It is extendable by the plugin-based architecture
- AML plugin is available only for the StarUML 5.0
- StarUML 2.x.x has been already published, but it does not support the AML language
- AML plugin does not exist for the EA tool
- Download:
Ukazky\Husakova.Martina\SoftwareProVyuku\ZT1...

StarUML and a new project

- Suitable structure for our projects

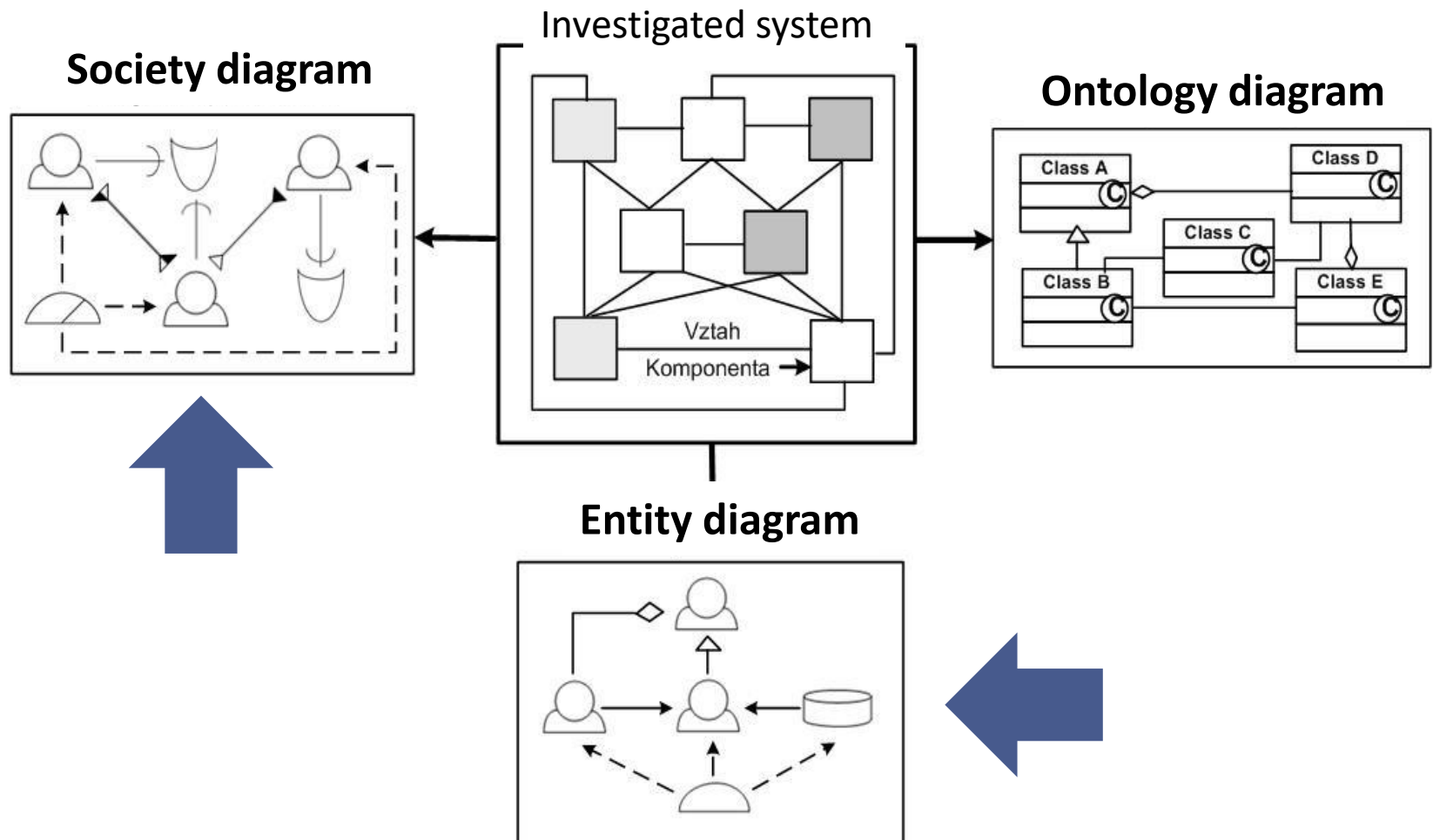


Package

Model

Particular diagram inside

Modelling architecture of the MAS



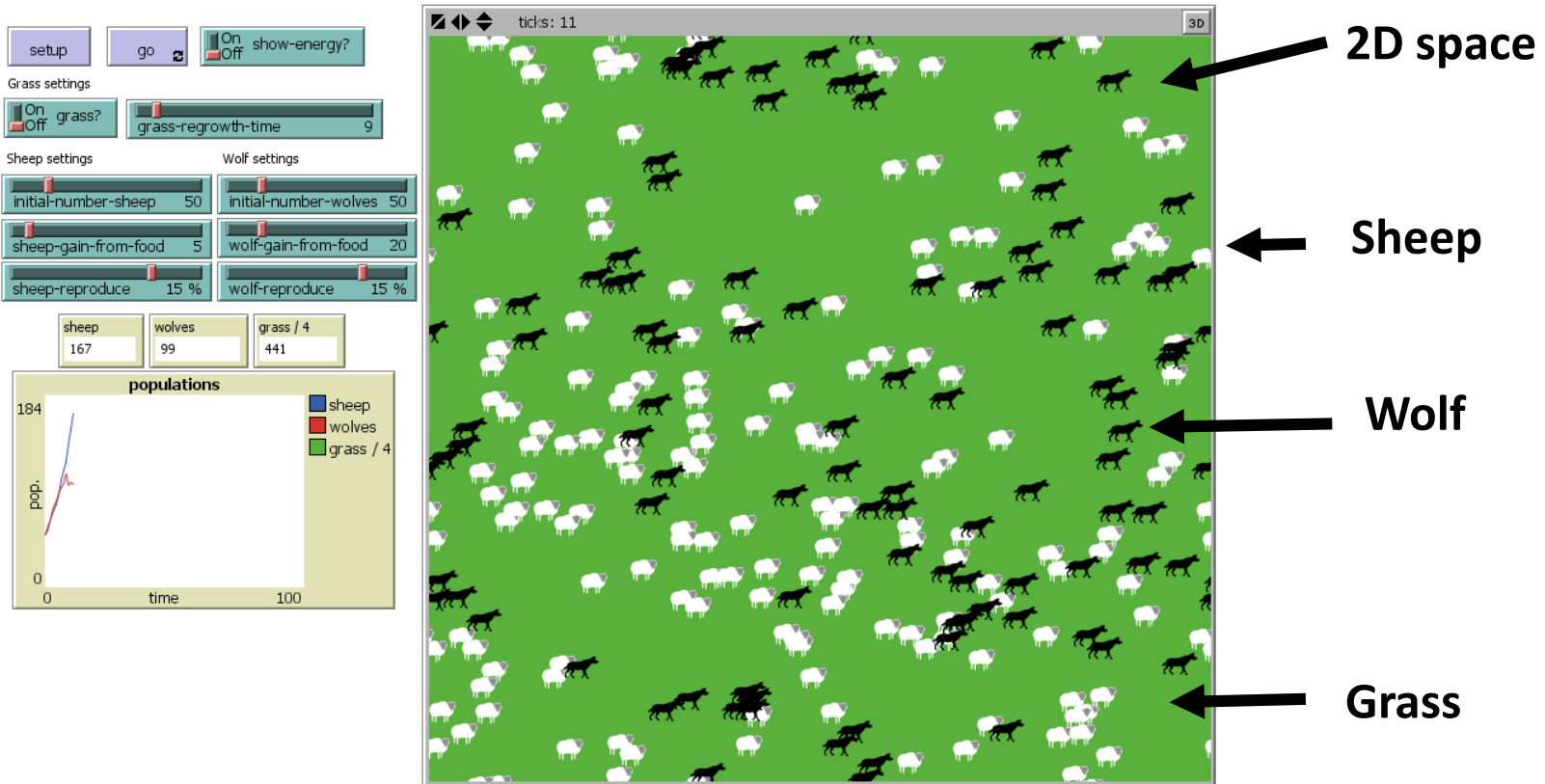
Modelling of the MAS architecture

- **Entity diagram**
 - Agent type
 - Environment type
 - Resource type
- **Society diagram**
 - Organisation unit type
 - Entity role type
 - Social association
 - Play association

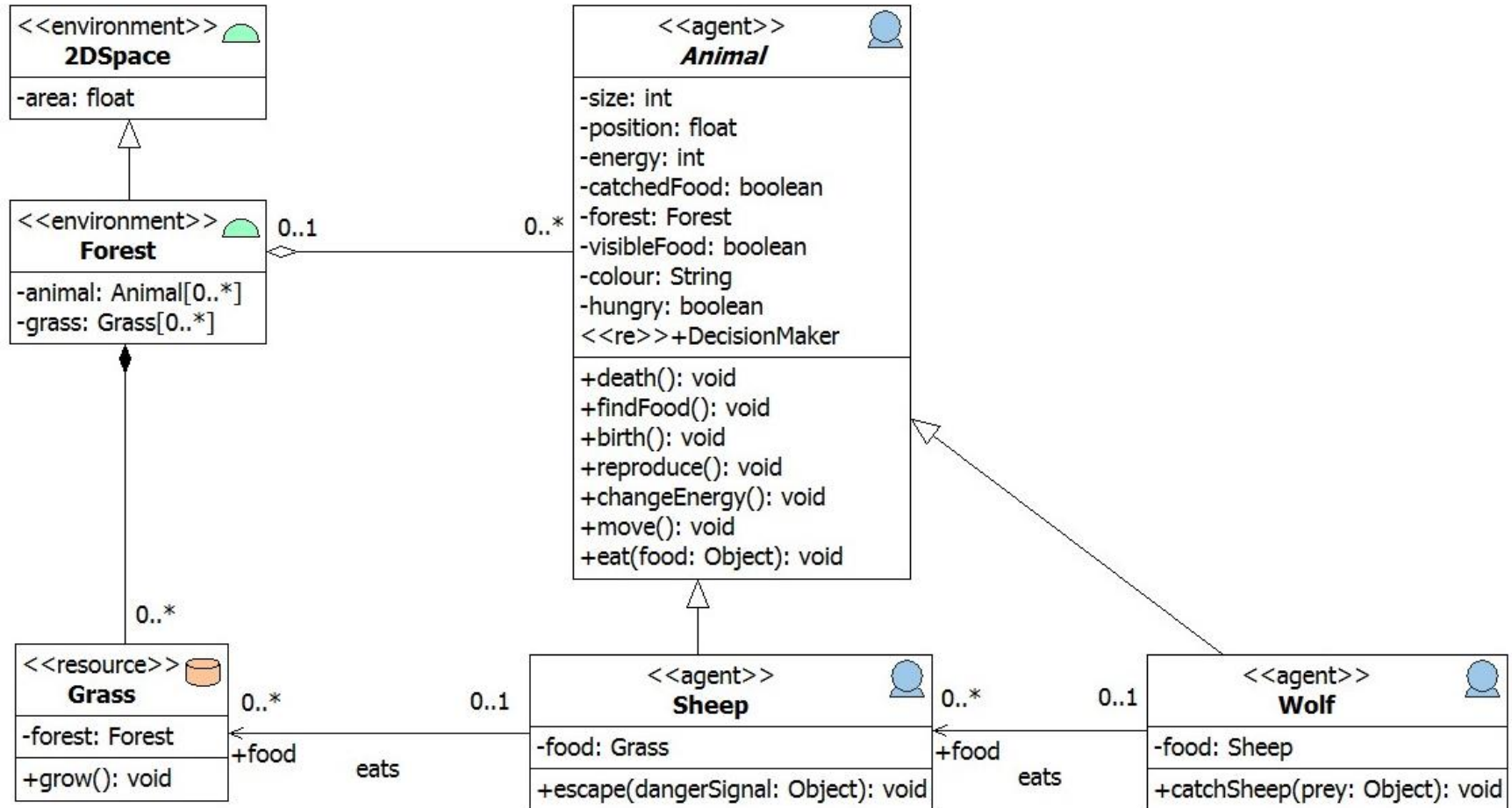
PRACTICAL DEMONSTRATION

Demonstration of an entity diagram usage

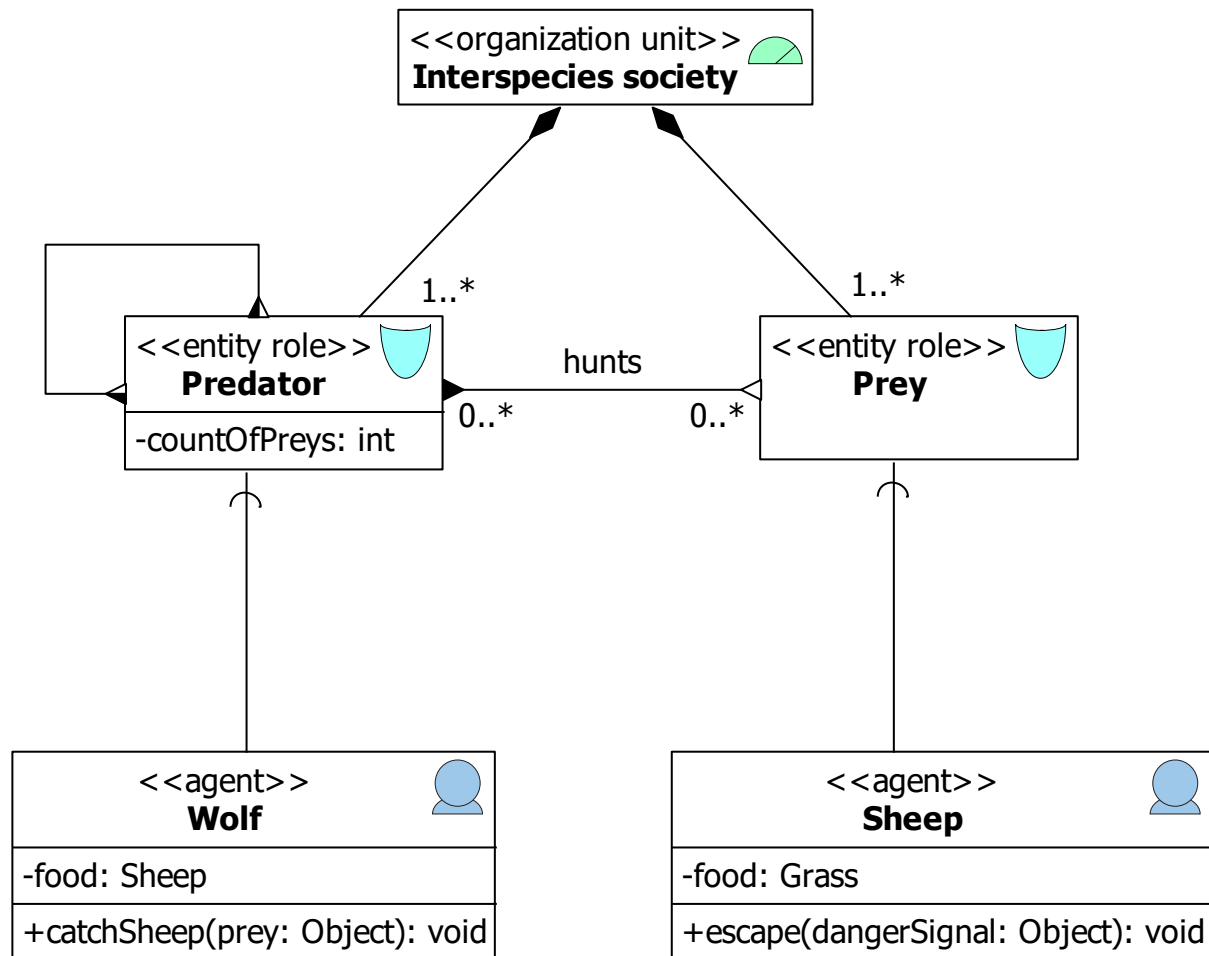
NetLogo: Biology/Wolf-Sheep predation



Entity diagram for a predator-prey model



Society diagram for a predator-prey model



Seminar work and homeworks

- Finish ODD+D protocol
- Use an **entity diagram** for your projet
- Use a **society diagram** for your project