

# Simulating behavior

DI Group

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**Where innovation starts**

# Simulation

- **Why**
  - **Unable to perform test in real life**
    - **Availability, Parameters, Ethics, ...**
- **How**
  - **Create a 'model' of reality**
  - **Make parameters tunable**
  - **See what happens**
- **Types**
  - **Agent based simulations**
  - **Hubnet based simulations**

- **Modeling**
  - **Complex systems developing over time**
  - **Participatory simulations (Hubnet)**
- **Books**
- **Online courses**
- **Many models available**
- **Used in many scientific research projects**

# Example areas

- **Art, Biology, Modeling, Chemistry, Computer science, Earth science, Games, Mathematics, Networks, Philosophy, Psychology, Social science, System dynamics,...**
- **Books**
- **Online courses**
- **Many models available**
- **Used in many scientific research projects**

# Examples

- **Vants**
  - **Simple deterministic rules result in complex seeming behavior**
  - **Time reversibility (because of determinism)**



Vants.nlogo

# Examples

- **Hubnet (Memory)**
  - **Multi participant models**



Example HubNet.nlogo

# Examples

- Vacuum cleaner
- Mazes
- Segregation (Social science)
- Network example
- Vision Cone
- Beatbox



Vacuum-Cleaner-Robot.nlogo



Mazes.nlogo



Segregation.nlogo



Network Example.nlogo



Vision Cone Example.nlogo



Beatbox.nlogo

# More

- **Many more examples in library**
  - Artificial neural networks,
  - Genetic algorithms
  - ...
- **Info to be found at**
  - <http://ccl.northwestern.edu/netlogo/>
  - <https://github.com/NetLogo/NetLogo/wiki>



End of slide show