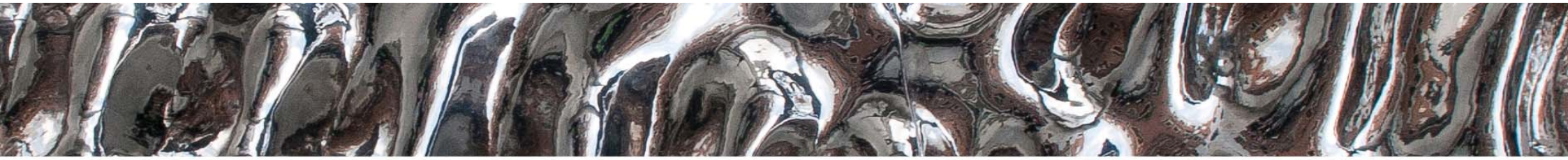

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University of Oslo

Kyrre Glette
Robotics and Intelligent Systems group, Department. of Informatics
RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion

ROBIN:

Robotics, Intelligent Systems and Evolutionary Computation

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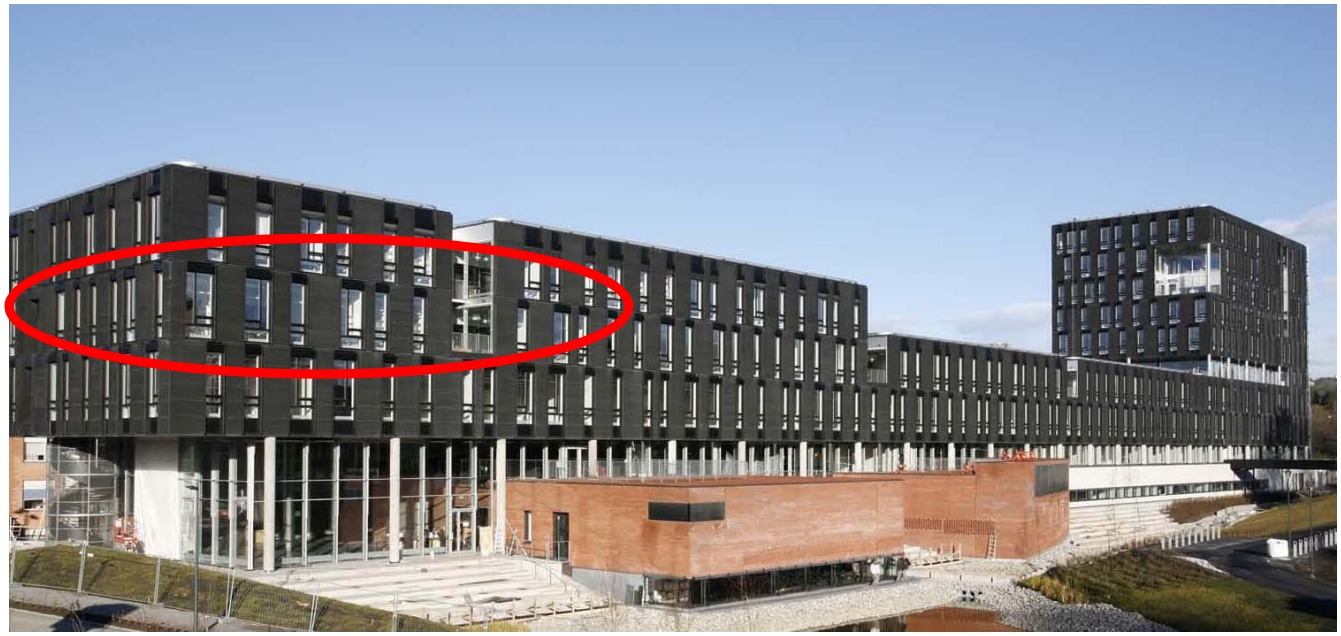
Robotics and Intelligent Systems (ROBIN)

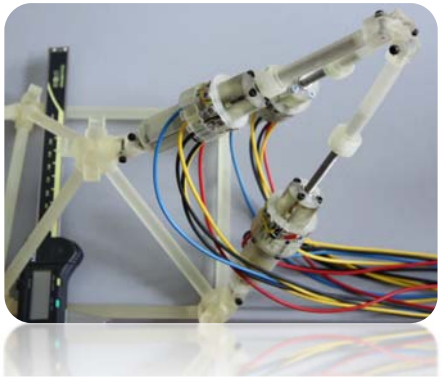


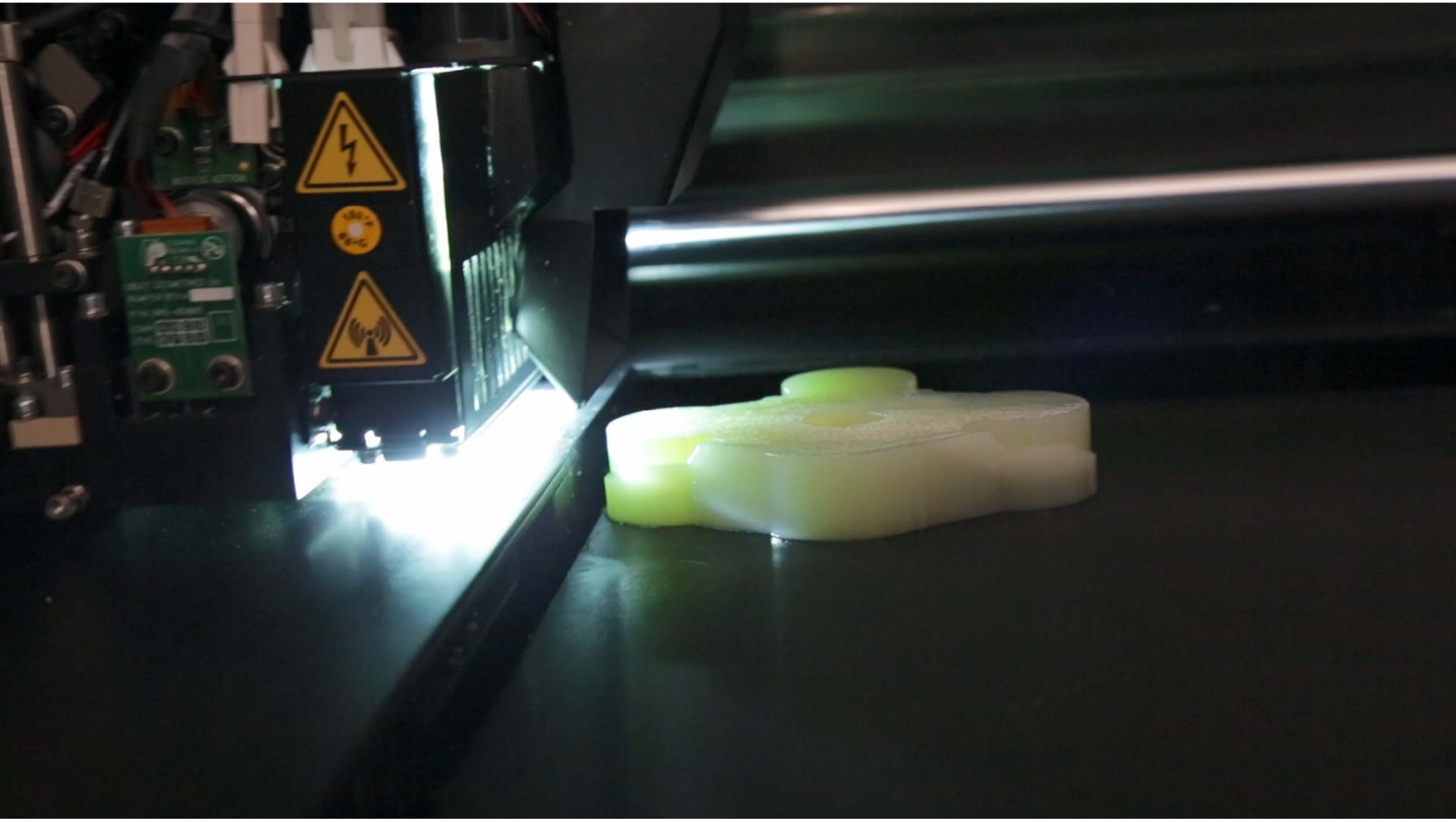
- 4 scientific faculty
- 1 engineer
- 5 adjuncts from research & industry
- 5 postdocs
- 6 phds

Research interests

- Methods: Computational intelligence
  - Evolutionary optimization
  - Machine learning
  - Self-aware, self-expressive systems
  - Swarm systems

- Applications:
  - Adaptive hardware
  - Autonomous, adaptive, and evolutionary robotics
  - Medical and health care robotics
  - Music technology





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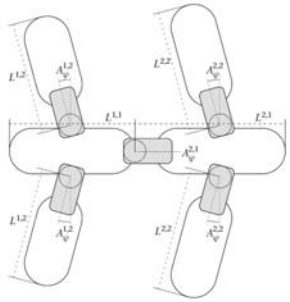
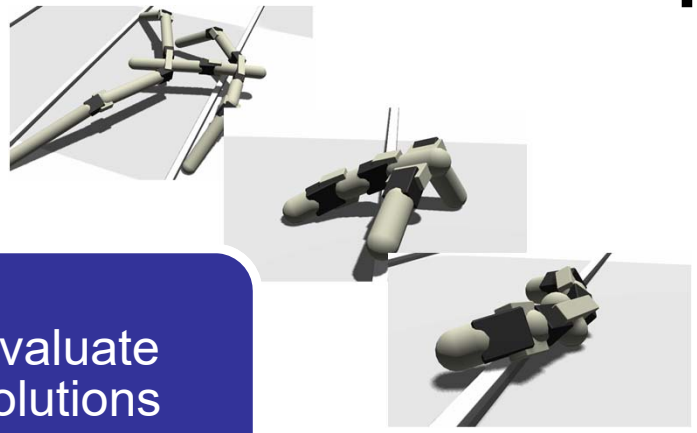
Automatic design process
Evolutionary algorithms
Parallel simulations
3D printing





Initialize random solutions

Evaluate solutions

Good solution to problem?

yes

Use/produce solutions

Create new solutions from good solutions

no

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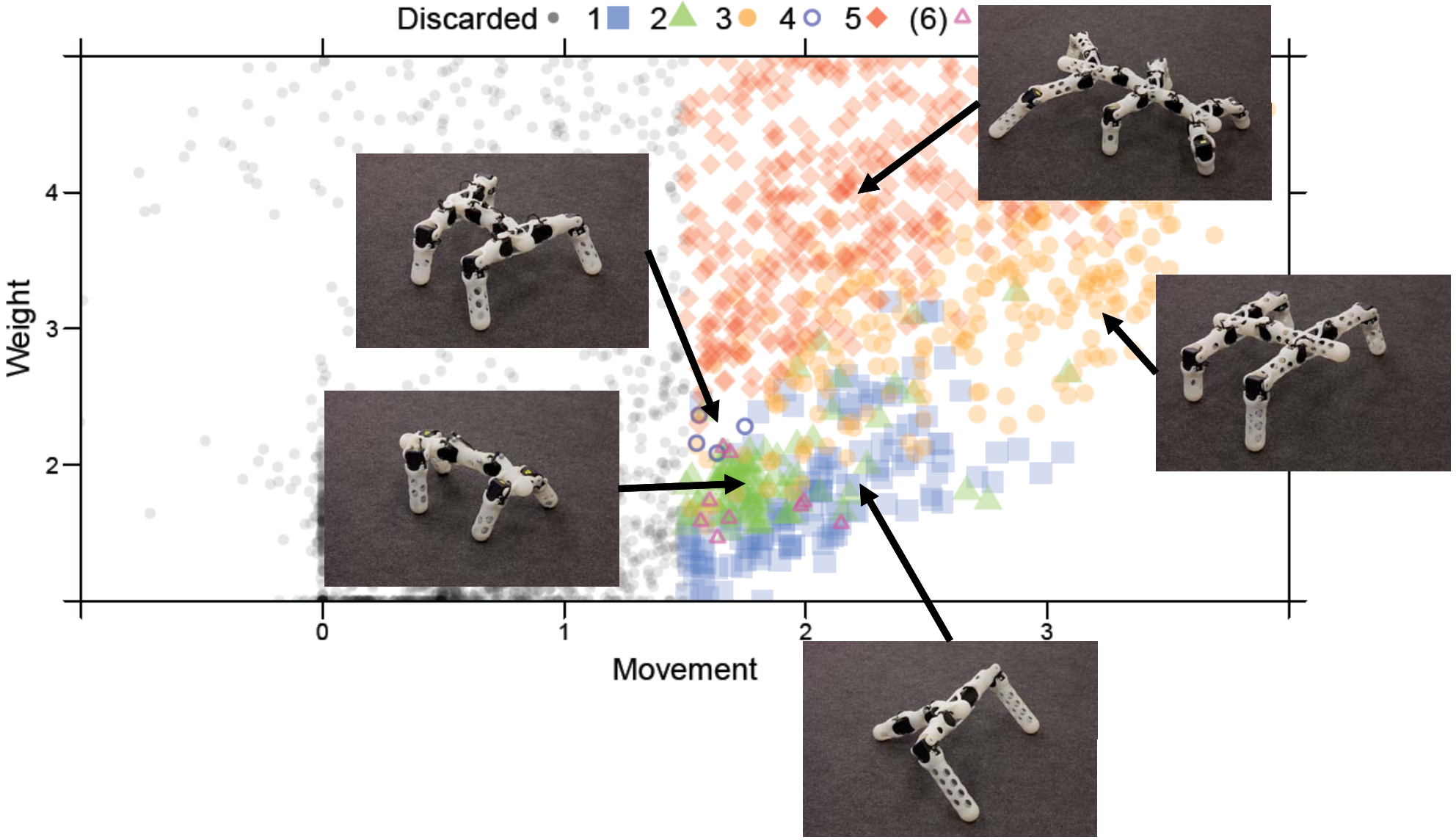
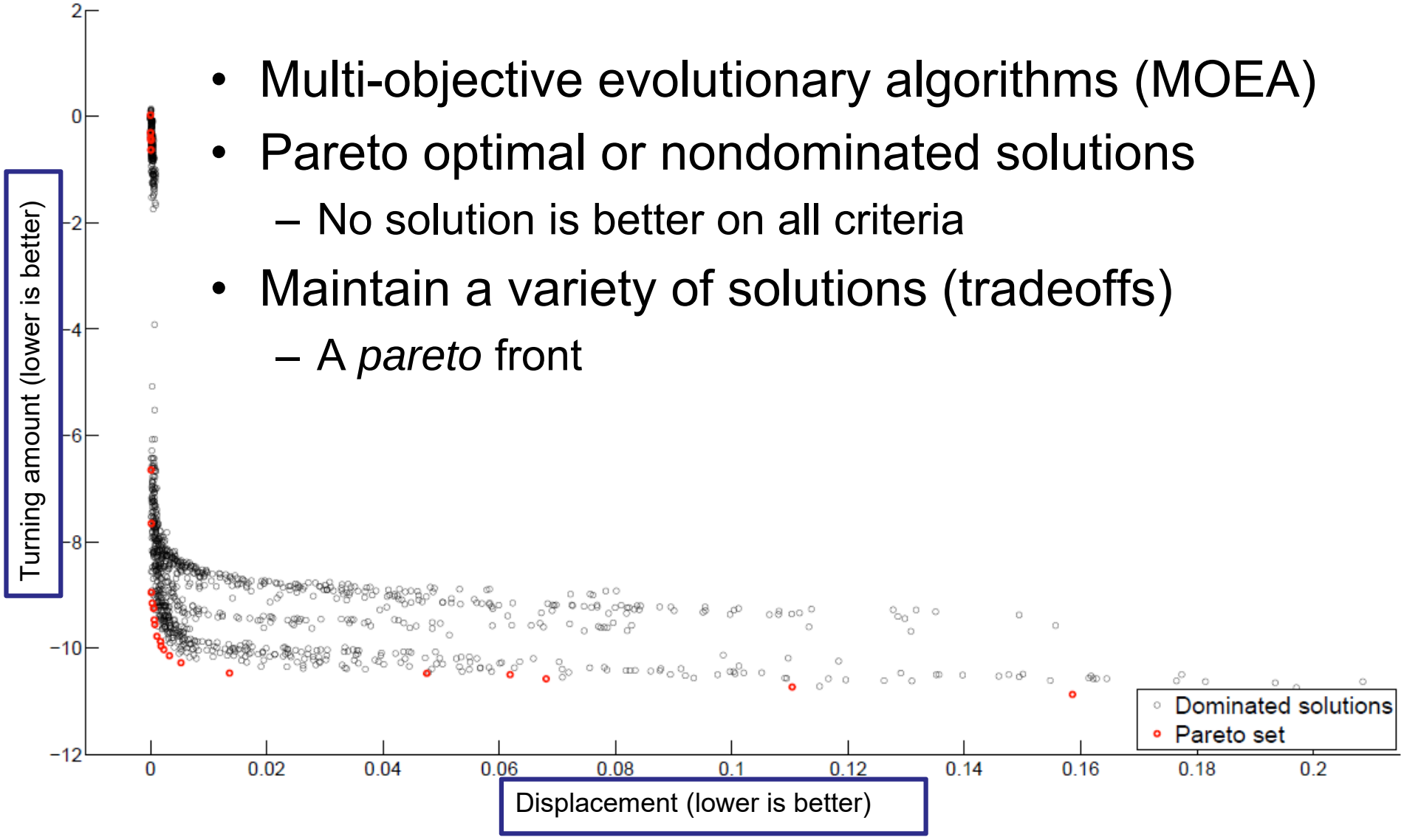
Select conceptually different solutions with machine learning



Optimization for multiple solution criteria

- Multi-objective evolutionary algorithms (MOEA)
- Pareto optimal or nondominated solutions
  - No solution is better on all criteria
- Maintain a variety of solutions (tradeoffs)
  - A *pareto* front



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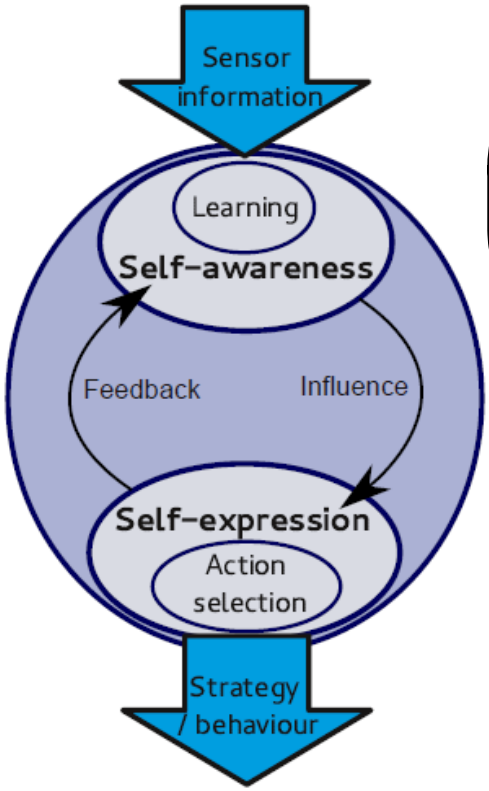
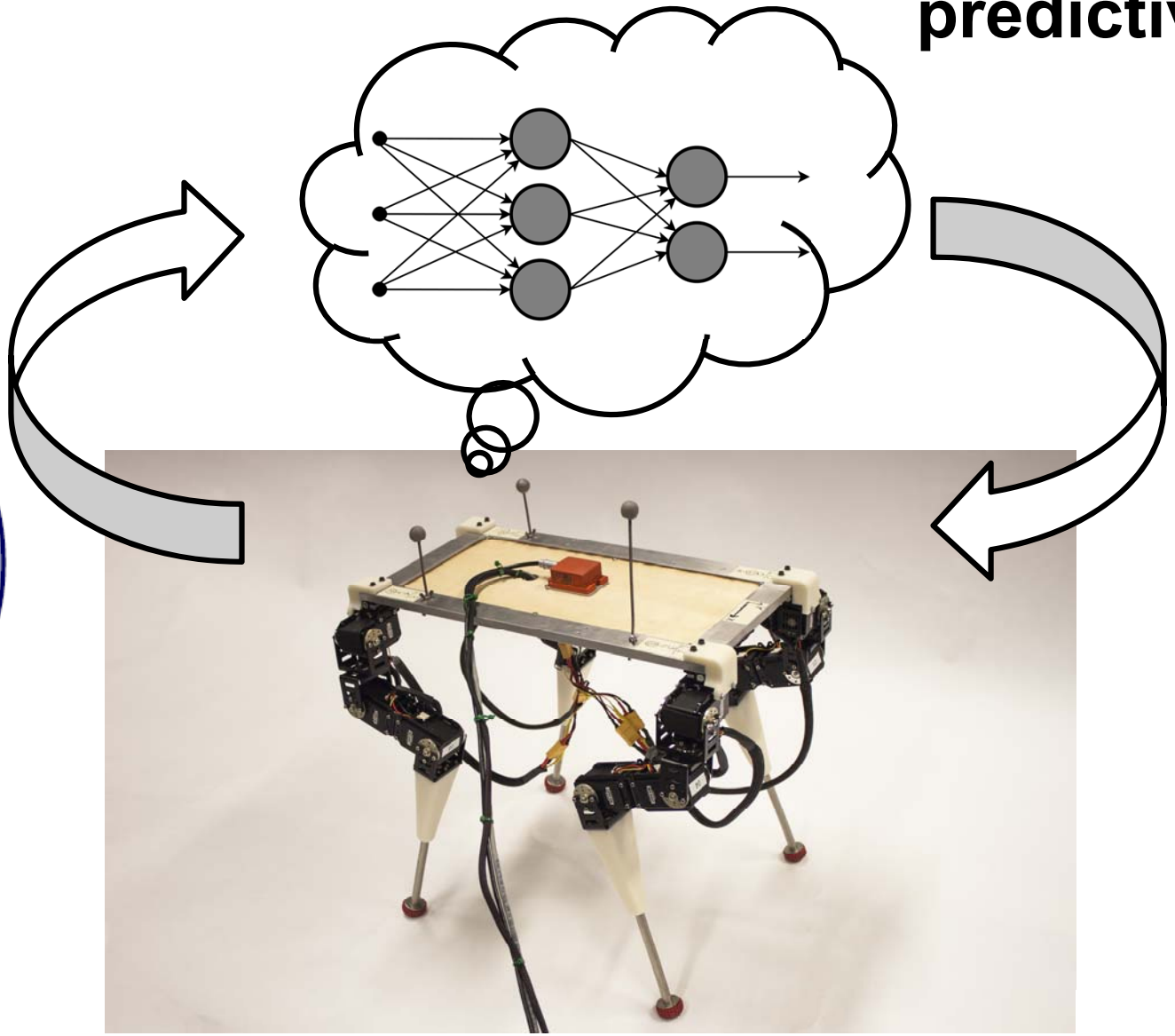
Self-aware and predictive robots





EPICS
Engineering Proprioception in Computing Systems

EPEC project (RCN)

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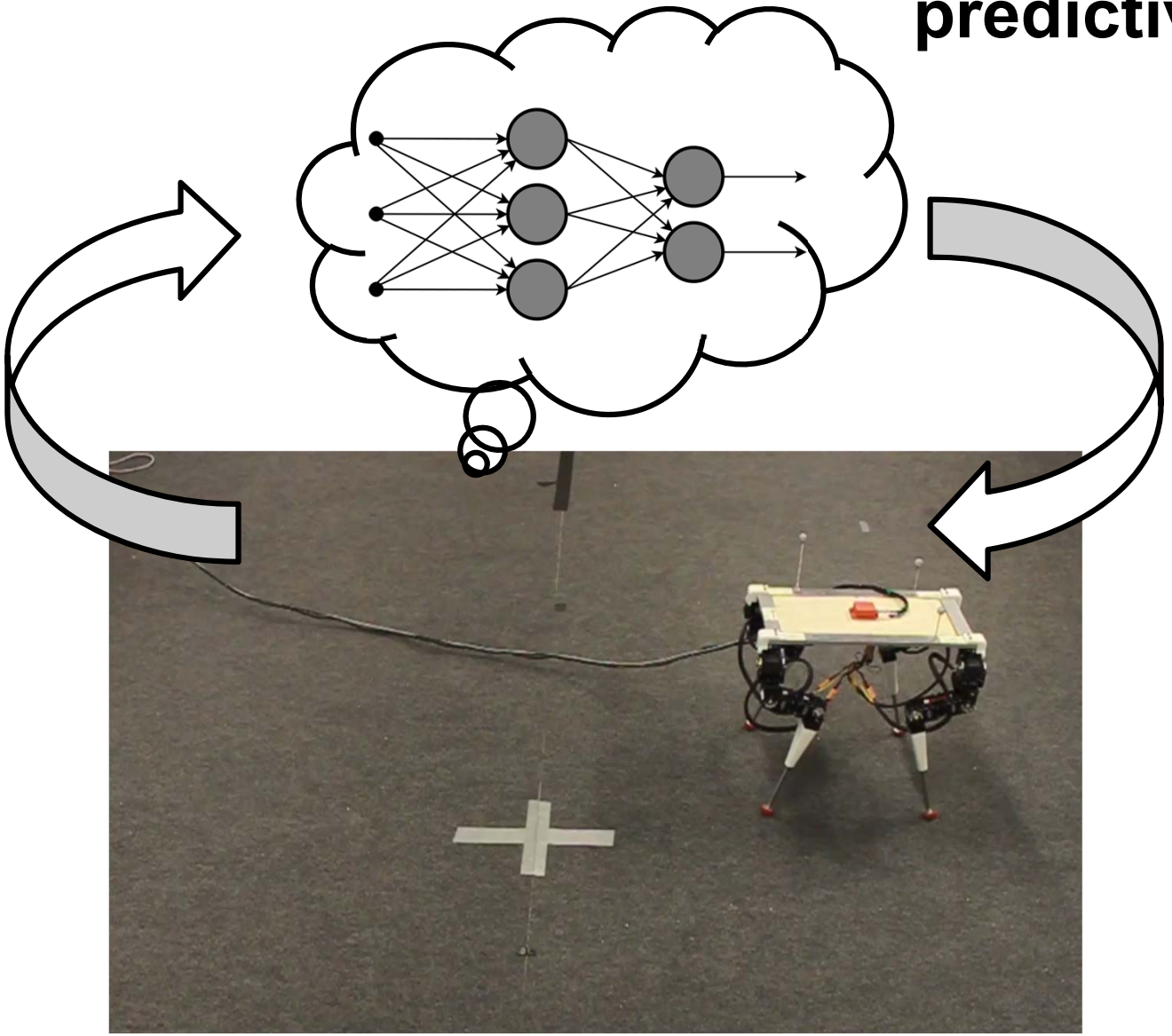
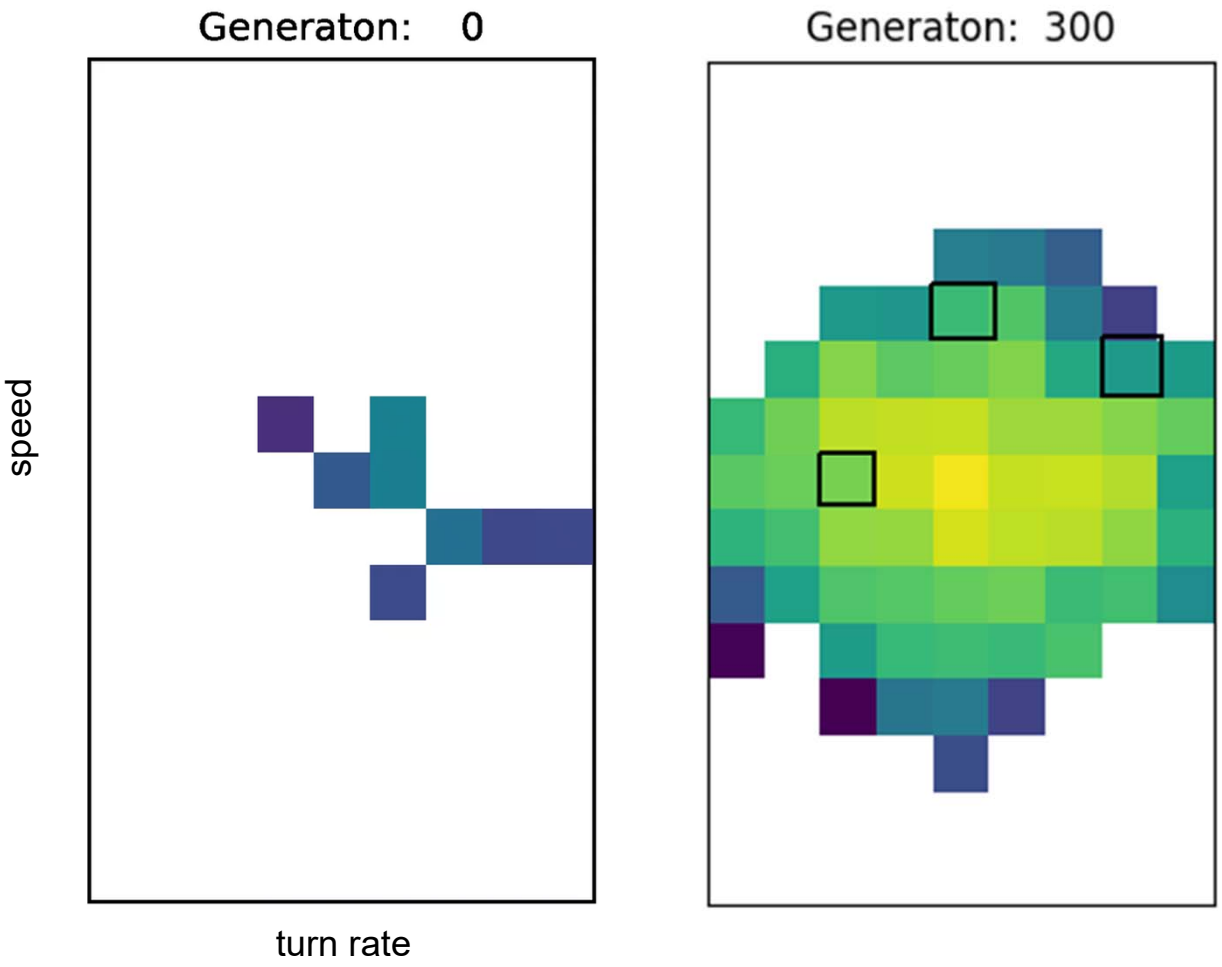
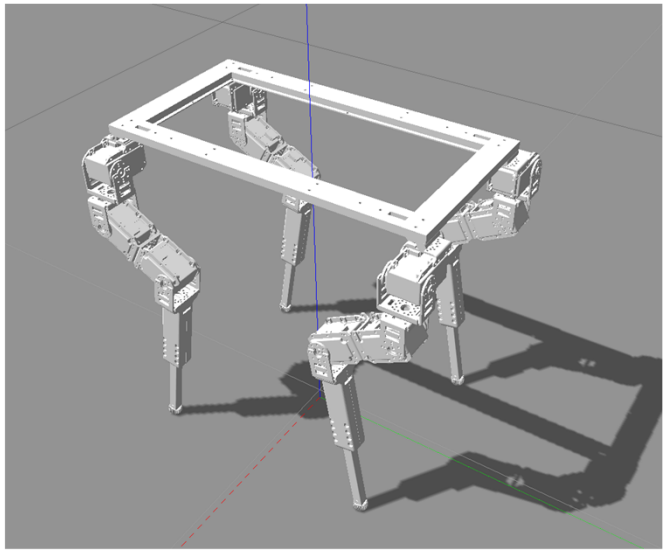
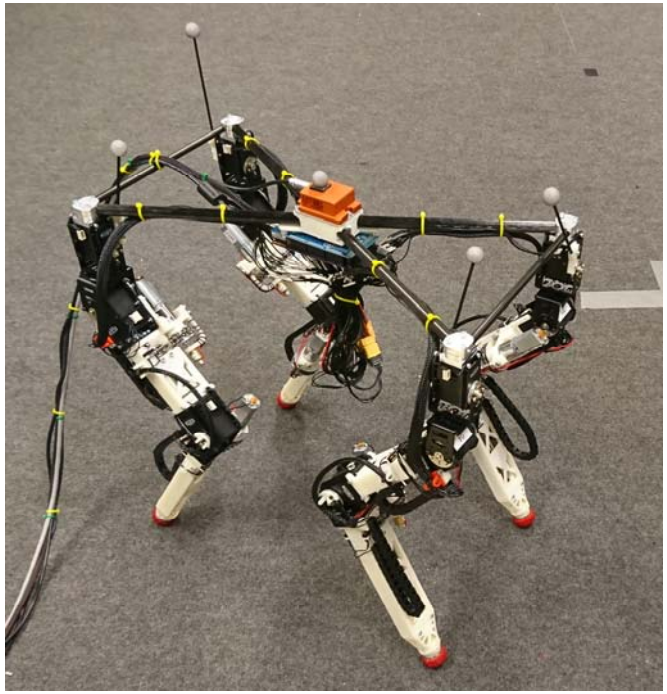
Self-aware and predictive robots



EPEC
RCN FRIPRO project

Repertoires of behaviors