MICRO-515 **Evolutionary robotics**

Cursus	Sem.	Type
Microtechnics	MA2, MA4	Opt.
Robotics	MA2, MA4	Opt.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	Written
Workload	90h
Weeks	14
Hours	**3 weekly**
Courses	3 weekly
Number of positions	

Remark

pas donné en 2019-20

Summary

NOT OFFERED IN 2020-2021 The course describes theories, methods, and technologies for designing software and hardware systems that are inspired upon natural evolution. It also shows how artificial systems can help to understand biological systems.

Content

- Natural and Artificial Evolution
- Evolutionary Computation and Applications
- Evolution of Neural Systems
- Advanced Evolutionary Algorithms
- Evolutionary Robotics
- Developmental Systems
- Evolution of Collective Systems

Learning Prerequisites

Important concepts to start the course

Programming skills (Phython, Java, C++)

Learning Outcomes

By the end of the course, the student must be able to:

- Apply new tools for software and hardware engineering
- Translate acquired theoretical knowledge in practical implementations during laboratory sessions

Teaching methods

Students will put the theory in practice by evolving the morphology and neural control of mobile robots in physics-based simulations and will also be able to 3D print and assemble the best evolved robots.

Assessment methods

Mini-project report/presentation + written exam

Resources

Bibliography

Floreano, D. & Mattiussi, C. (2008) Bioinspired Artificial Intelligence. MIT Press (selected chapters)

Ressources en bibliothèque

- Bioinspired Artificial Intelligence / Floreano