

- Faculté des sciences
- www.unine.ch/sciences

Reinforcement Learning and Decision Making Under Uncertainty (3IN2064)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en économie appliquée	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	5
Master en finance	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	5
Master en informatique	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	5

ph=période hebdomadaire, pg=période globale, j=jour, dj=semi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante

Christos Dimitrakakis <christos.dimitrakakis@unine.ch>
Jakub Tluczek

Contenu

Statistical decision problems
Introduction to Bayesian inference
Markov decision processes
Dynamic programming:
- Backwards Induction
- Value Iteration
- Policy Iteration
- Temporal Differences
Stochastic Dynamic Programming:
- Q-Learning
- Sarsa
- Actor Critic Methods
- Monte Carlo Methods
Model Based Reinforcement Learning:
- Direct Model-Predictive Control
- Bayesian Reinforcement Learning
Upper confidence bounds:
- Bandit problems
- Reinforcement Learning
Inverse Reinforcement Learning
Multi-agent Reinforcement Learning

Forme de l'évaluation

Mandatory assignments (20% of the grade)
Group project (40% of the grade)
Written exam (40% of the grade)

All parts of the course must be passed.

Modalités de rattrapage

You need to repeat those parts of the course that you failed.

Pré-requis

Linear Algebra

URLs	1) https://github.com/olethrosdc/rldmuu 2) https://ilias.unibe.ch/ilias.php?baseClass=ilrepositorygui&cmdNode=yw:mu&cmdClass=ilObjCourseGUI&ref_id
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Calculus
Probability Theory
Basic competence in a programming language (C, Python, Octave/Matlab, etc)

Forme de l'enseignement

Lectures and exercises

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Formulate Decision Problems
- Develop Algorithms
- Apply Algorithms
- Compute Probabilities and expectations
- Explain Algorithms and Theory
- Develop Project
- Integrate Theory and Practice

Compétences transférables

- Explore Scientific literature
- Develop state-of-the-art methods

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