Tárgyleírás

Tárgy neve: Deep Reinforcement Learning

Tárgyfelelős neve: Dr. habil Lőrincz András

Tárgyfelelős tudományos fokozata: CSC

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja angolul / Aim of the subject:

Knowledge

- They have comprehensive and up-to-date knowledge of general mathematical and computing principles
- Posess the knowledge of specific tools and methods related to reinforcement learning

Abilities:

- They are able to apply their mathematical, computer science and informatics skills in a novel way in order to solve tasks in IT research and development.

Attitude:

- They follow professional and technological developments in their IT field.
- They are committed to lifelong learning and are open to acquiring new IT competencies.
- They accept and make their co-workers apply the ethical principles of work and organizational culture as well as those of IT scientific research.
- They share their knowledge and consider it important to disseminate professional IT results.

Autonomy, responsibility:

- They take responsibility for their professional decisions made in their IT-related activities.
- They undertake to meet deadlines and to have deadlines met.
- They bear responsibility for their own work as well as for the work of their colleagues they work together with in a project.
- Regarding mission critical IT systems, they can be entrusted with developing and operational responsibilities that are in accordance with their professional competencies.

Az oktatás tartalma angolul / Major topics:

Theory
1. Markov Decision Processes
2. Dynamic Programming
3. Monte Carlo Methods
4. Temporal Differencing Methods

5. Policy Gradients
6. Eligibility Traces
7. Function Approximators
8. Value-Based Deep RL
9. Policy-Based Deep RL
10. Model-Based Deep RL
11. Meta Learning
12. Multi-Agent RL

Software tools
- Deep Q-Learning with Open Gym
- Applications

A számonkérés és értékelés rendszere angolul / Requirements and evaluation:

Continuous Assessment, exam

Irodalom / Literature:

- Richard S. Sutton and Andrew G. Barto: Reinforcement Learning: An Introduction. 2nd edition, MIT Press, 2018. ISBN-13: 978-0262039246
- Maxim Lapan: Deep Reinforcement Learning Hands-On, 2nd edition, Packt Publishing, 2020, ISBN-13: 978-1838826994