

# Foundations of Reinforcement Learning

## From Markov Decision Processes to Optimal Value Functions

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# Today's Agenda

- ① Course Information
- ② What is Reinforcement Learning
- ③ Markov Decision Processes
- ④ Value Functions

## Course Information

- Coordinator: Matthia Sabatelli
- Lecturers: Matthia Sabatelli ([m.sabatelli@rug.nl](mailto:m.sabatelli@rug.nl)) and Nicole Orzan ([n.orzan@rug.nl](mailto:n.orzan@rug.nl))
- Classroom: TBD
- Theoretical Lectures: Monday morning from 9:00-11:00
- Computer Labs: Monday afternoon from 15:00-17:00

# Course Information

- Lecture 1: Foundations of Reinforcement Learning (Matthia)
- Lecture 2: Exploration and Bandit Problems (Nicole)
- Lecture 3: Dynamic Programming (Nicole)
- Lecture 4: Model-Free Reinforcement Learning (Matthia)
- Lecture 5: Function Approximators (Matthia)
- Lecture 6: Beyond Model-Free Reinforcement Learning (Matthia)
- Lecture 7: *What does it mean to do research in RL?* (Matthia & Nicole)

# Course Information

All **course material** will be made available

- Nestor
- Github: `https://github.com/paintception/reinforcement-learning-practical`

# Course Information

**Textbook:** Reinforcement Learning: An Introduction by Sutton & Barto

# Course Information

Final course [assesement](#):

- There is **no exam**
- Students should handle in three deliverables:
  1. Assignment 1: 25% of the grade (coding)
  2. Assignment 2: 25% of the grade (mathematics)
  3. Report: 50% of the grade (final project)
- Students can work alone or in groups of a maximum of **2** people

# Reinforcement Learning



# Markov Decision Processes

# Value Function