Course Overview

Deep Reinforcement Learning

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Outline

- **Course organization**
  - Short Biography
  - Learning objectives
  - Bibliography
  - Grading
  - Planning

Alberto Sardinha

Research projects: RELEvaNT, HOTSPOT, TAILOR, Ad Hoc Teams, ILU, INSIDE, LIREC
- Multiagent systems: ad hoc teamwork, deep reinforcement learning agents, robotics

Research interests
- Multiagent decision making
- Machine learning
- Real Options
- Application domains: Human-robot interaction, smart mobility, renewable energy

Professional path
- Professor @ DI/PUC-Rio (2023 – present)
- Professor @ IST, Portugal (2010-2023)
- Senior researcher @ INESC-ID, Portugal (since 2012)
- Marie Currie fellow @ Lancaster University, UK (2008 – 2010)
- Post-doc fellow @ Carnegie Mellon University, USA (2005 – 2008)
- System Specialist @ IBM, Brazil (1995 – 1999)

Learning Objectives

- **Models for decision making**

  - Sequential decision making under uncertainty

- **Learning and decision making**

  - Reinforcement learning

  - Deep reinforcement learning
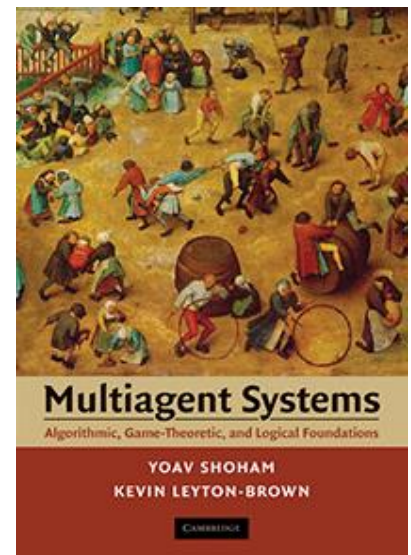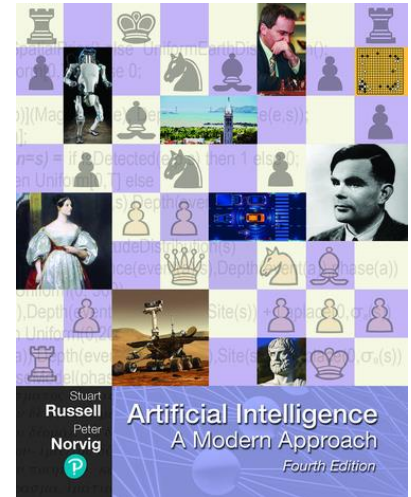
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Primary

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- **Multi-Agent Reinforcement Learning: Foundations and Modern Approaches**, Stefano V. Albrecht, Filippos Christianos, Lukas Schäfer, MIT Press, 2024.
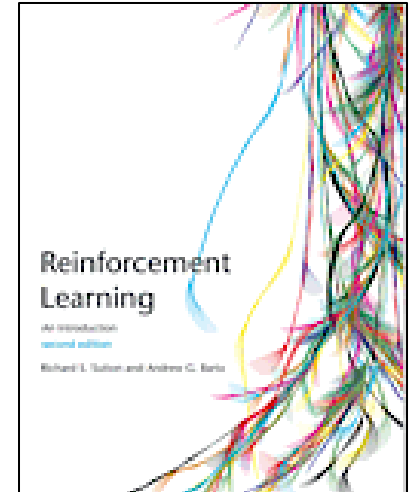
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Secondary

- ***Artificial Intelligence: A Modern Approach,*** 4th Ed, Stuart Russel and Peter Norvig, Prentice-Hall, 2021.

- ***Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations,*** 1st Ed, Yoav Shoham and Kevin Leyton-Brown, Cambridge University Press, 2009
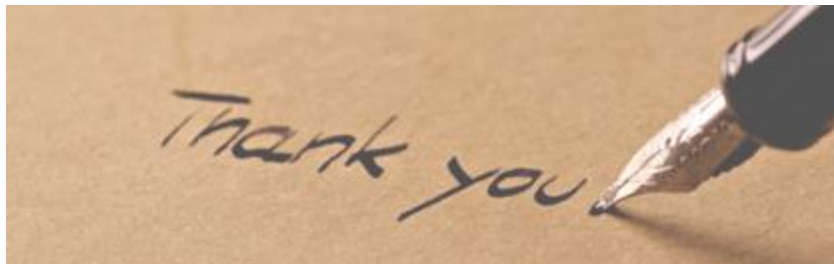
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Secondary

- ***A Concise Introduction to Multiagent Systems and Distributed Artificial Intelligence***, Nikos Vlassis, Morgan & Claypool, 2007
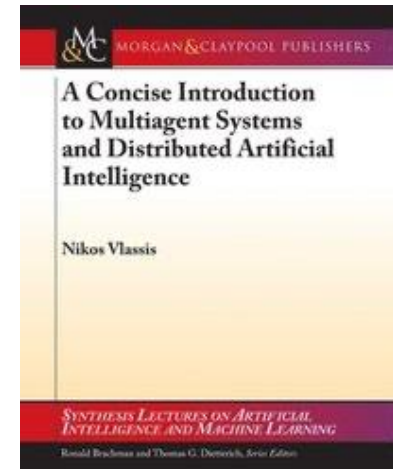
Grading

- **Coding exercises**

- **Project (AWS DeepRacer)**
  - https://www.youtube.com/watch?v=kVapdV6R294

- **Presentation of scientific paper**

Thank You

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