**Bibliografia e sitografia tesi**

* Frequency Adjusted Multi-Agent Q-learning, Michael Kaisers and Karl Tuyls;
* An Evolutionary Dynamical Analysis of Multi-Agent Learning in Iterated Games, K. Tuyls, P. J. ’t Hoen and B. Vanschoenwinkel
* Pybricksdev documentation, <https://code.pybricks.com/static/docs/v2.7.0/index.html>
* Bleak Documentation, <https://bleak.readthedocs.io/en/latest/>
* <https://www.cmu.edu/dietrich/sds/ddmlab/papers/2021McDonaldetalAAAISymposium.pdf>
* Science Direct
* L. Busoniu, R. Babuska and B. De Schutter, "A Comprehensive Survey of Multiagent Reinforcement Learning," in IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews), vol. 38, no. 2, pp. 156-172, March 2008, doi: 10.1109/TSMCC.2007.913919.
* <https://deepmind.google/>
* The AlphaStar Team, “AlphaStar: Grandmaster level in StarCraft II using multi-agent reinforcement learning”, 30 October 2019
* Huy Xuan Pham, Hung Manh La, David Feil-Seifer, Aria Nefian, “Cooperative and Distributed Reinforcement Learning of Drones for Field Coverage”, 20 March 2018
* [K Lin](https://scholar.google.com/citations?user=egq785sAAAAJ&hl=it&oi=sra), R Zhao, [Z Xu](https://scholar.google.com/citations?user=CJgDlnoAAAAJ&hl=it&oi=sra), [J Zhou](https://scholar.google.com/citations?user=yQKlLTQAAAAJ&hl=it&oi=sra), "[Efficient large-scale fleet management via multi-agent deep reinforcement learning](https://dl.acm.org/doi/abs/10.1145/3219819.3219993)“, 2018
* [Y Sui](https://scholar.google.com/citations?user=Youm7ZMAAAAJ&hl=it&oi=sra), S Song , “[A multi-agent reinforcement learning framework for lithium-ion battery scheduling problems](https://www.mdpi.com/1996-1073/13/8/1982)”
* Canese L, Cardarilli GC, Di Nunzio L, Fazzolari R, Giardino D, Re M, Spanò S. Multi-Agent Reinforcement Learning: A Review of Challenges and Applications. Applied Sciences. 2021; 11(11):4948.

**Possibile indice e argomenti trattati**

* Introduzione
* Multi Agent Learning
* MAL vs SAL
* Spike Prime
* A cosa serve spike prime e come funziona
* Problematiche di comunicazione e coding
* Soluzione: Pybricksdev (panoramica)
* Modellazione algoritmi di controllo
* Single agent learning
  + qLearning sul robot
  + simple qlearning
  + gridsearch
    - gridsearch free
    - gridsearch monitored
    - gridsearch with hub
  + qLearning peer to peer
  + analisi sulle modalità di apprendimento
* Multi agent learning
  + Centralized qlearning -> good
  + Decentralized qLearning -> not good
  + Decentralized faq-learning -> good
* Osservazioni successive
* Conclusioni