



Universidad Politécnica
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**Escuela Técnica Superior de
Ingenieros Informáticos**



Master in Data Science

Master Thesis

Design and Prototyping of an Ecosystem Simulator for Intelligent Agents

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Summary

<Here is the summary of the TFM. Maximum extension 2 pages.»

Abstract

«Abstract of the Master Project. Maximum length: 2 pages.»

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Chapter 1

Introduction

1.1 Motivation

The field of artificial intelligence has been increasing its popularity in the last years. Since the publication of the paper "Attention is all you need" [3], the transformer architecture that it introduced has brought the creation of gigantic models capable of processing huge amounts of data. This is the case for the large language models and the generative ones.

However all these improvements are based in the classic core idea of supervised learning, with the only difference been the architectures that allow much more examples in the training process. With this scenario in mind, it is interesting that we take a step back and consider exploring other algorithms and learning methods that do not only depend on raw data and computation power.

Reinforcement Learning tries to model behaviour for intelligent agents with no more data than the input that the proper agents receive from the environment. This family of algorithms are heavily based in game Theory and the concept of reward. As stated in the publication "Reward is Enough" [1], the idea of receiving positive feedback creates a strong guidance for learning complex tasks.

1.2 Objectives

1.3 Problem Description

1.4 State of the art

Chapter 2

Master's Project Content

2.1 Section 1 chapter 2

2.1.1 Subsection 1 section 1 chapter 2

2.1.1.1 Subsection 1

2.1.1.2 Subsection 2

2.1.2 Subsection 2 section 1 chapter 2

2.2 Section 2 chapter 2

2.3 Section 3 chapter 2

Chapter 3

Results and conclusions

Summary of results obtained in the TFM. And personal conclusions of the student about the work done.

Bibliography

- [1] Silver, D., Singh, S., Precup, D., & Sutton, R. S. (2021). Reward is enough. *Artificial Intelligence*, 299, 103535. •
- [2] Baker, B., Kanitscheider, I., Markov, T., Wu, Y., Powell, G., McGrew, B., & Mor-datch, I. (2019). Emergent Tool Use From Multi-Agent Autocurricula. 8th International Conference on Learning Representations, ICLR 2020. •
- [3] Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). Attention Is All You Need. *Advances in Neural Information Processing Systems*, 2017-December, 5999–6009. •

Annex

This is an optional chapter, and will be written according to the instructions of the Tutor.