

EMERGENT IA TECHNIQUES IN VIDEOGAMES

Code: 28503

Main Scientific Area: Information Systems and Artificial Intelligence

Lecturer: Daniel Fontenele Nogueira

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 30h Total Workload: 100h

ECTS: 5,0

Objectives

This curricular unit aims to introduce students to artificial intelligence techniques that can assist in developing digital games.

Learning Outcomes

Students should understand the various areas of artificial intelligence in game development and how games are being used to collect information to create AI models.

To do this, students must be able to understand how advanced techniques work:

- Artificial Neural Network;
- Convolutional Neural Network;
- Reinforcement Learning;
- Natural Language Processing.

Course Contents

- Introduction to Artificial Intelligence
- Artificial Neural Network (ANN)
- Convolutional Neural Network (CNN)
- Computer Vision
- Reinforcement Learning
- Natural Language Processing

Recommended Bibliography

- Oliveira, A. (2019). Inteligência artificial. Fundação Francisco Manuel dos Santos.
- Cormen, T. H., Leiserson, C. E., Rivest, R. L., Stein, C. (2022). Introduction to algorithms. MIT press.
- Norvig, P., Russell, S. (2013). Inteligência artificial. Rio de Janeiro: Grupo GEN.
- Tan, P. N., Steinbach, M., Kumar, V. (2006). Introduction to Data Mining.
- Yannakakis, G. N., Togelius, J. (2018) Artificial Intelligence and Games. Springer

Learning and Teaching Methods

The program contents present an initial part of the contextualization of artificial intelligence and its traditional game application. Subsequently, the main modern techniques applied in games are presented.

Assessment Methods

Students will be challenged to prepare a scientific article (using a template from a scientific journal), choosing between the format options:

- scientific article presenting the application of AI techniques in the context of the project to be developed by the student;
- bibliographic review article on AI techniques applied to a specific case (review of no less than 20 articles)

This article will be reviewed by the professor and presented by the student at a scientific conference.

The composition of the final grade will be given by:

- Article: 50%
- Presentation: 50%