# Eleni **Evripidou**

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## skills

Game Development, AI in Games, Computer Graphics, Computer Animation, Object-Oriented Programming, Algorithmic Complexity, Data Structures, Machine Learning, Databases, Physics, Mathematics, Computational Physics, Numerical Analysis

**Programming Languages:** C#, Java, C/C++, Python, MATLAB, FORTRAN, Wolfram Mathematica, HTML, PHP, SQL

**Tools:** Unity, Unity ML-Agents Toolkit, Blender, LaTeX, Github, Eclipse IDE, PyCharm IDE, Microsoft Visual Studio, OpenGL, Adobe Photoshop, Microsoft Office

**Operating Systems:** Windows, Linux

## experience

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| Jun 2022-<br>Mar 2023 | **INTERN** *Full-time, CYENS - Centre Of Excellence: V-Eupnea Group*<br>The internship was completed with the V-Eupnea Group, which focuses on simulating virtual humans, animals, and crowds. The project was about studying how Reinforcement Learning techniques can be used to train a multi-agent team with different skills in Unity and was published in a *Special Issue of the Journal Computer Animation and Virtual Worlds*. |
| Sep - Dec<br>2021 | **TEACHING ASSISTANT** *Part-time, University of Cyprus*<br>Assignment grading for the undergraduate level course "Distributed Algorithms". |

## education

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| 2020 - 2022 | **MSc in Computer Science**, *Final Grade: 9.09/10*<br>University of Cyprus<br>Visual Computing, Computer Games Software Techniques, Computer Graphics: Modeling & Realism, Object Oriented Programming, Data Structures and Algorithms, Algorithms and Complexity, Artificial Intelligence, Databases, Distributed Systems |
| 2018 - 2019 | **MSc in Theoretical Physics**, *Class of Award:* Distinction<br>University of Edinburgh |
| 2014 - 2018 | **BSc in Physics**, *Final Grade: 8.46/10*<br>University of Cyprus |

## game projects

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| Jun 2022-<br>Mar 2023 | **COLLABORATIVE MUSEUM HEIST WITH REINFORCEMENT LEARNING**<br>*MSc Thesis in Computer Science & CYENS - Centre Of Excellence Internship*<br>**Accepted** to the *36th International Conference on Computer Animation & Social Agents 2023 (CASA 2023)*<br>**Published** to a *Special Issue of the Journal Computer Animation and Virtual Worlds (CAVW)* |

- **Goal:** Examine how Reinforcement Learning techniques can be used to a Non-Zero Sum, adversarial asymmetric game, using a multi-agent team with different skills.
- **Implementation:** Created a game environment that simulates a museum heist, where the objective of the successfully trained team of robbers with different skills (Locksmith, Technician) is to steal valuable items from the museum without being detected by the scripted security guards and cameras. Both agents were trained concurrently with separate policies and received both individual and group reward signals.
- **Results:** Through this training process, the agents learned to cooperate effectively and use their skills to maximize both individual and team benefits. These results demonstrate the feasibility of realizing the full game where both robbers and security guards are trained at the same time to achieve their adversarial goals.
- **Tools:** Unity, C#, Unity ML-Agents Toolkit, Blender

*Evripidou, E, Aristidou, A, Charalambous, P. Collaborative museum heist with reinforcement learning. Comput Anim Virtual Worlds. 2023;e2158.* https://doi.org/10.1002/cav.2158

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| Apr - May<br>2021 | **MINI GAME: CHICKEN ESCAPE** *, Course: Computer Games Software Technology* |

- **Description:** An endless runner game with turns. A mechanism procedurally generates the path, along with the items and removes them when necessary to ensure memory efficiency. The implementation is scalable such that it can easily be manipulated to increase difficulty and incorporate new assets. The implementation includes audio, animations, special effects and a user interface. The hero's mesh and animation are created in Blender.
- **Tools:** Unity, C#, Blender

https://eevrip.github.io/chickenEscape-details

# other projects

### BEHAVIOUR BLENDING
- **Goal:** Create a tool that can be used by artists to manipulate the behaviour of crowds by changing some parameters.
- **Implementation:** Study how Reinforcement Learning can be used for crowd simulation. This was an effort to blend two simple behaviours, the flee and seek behaviour. The two behaviours were trained separately using Reinforcement Learning. Afterwards, we used the user defined weights to blend the outputs of the two policies.
- **Results:** Required a different approach.
- **Tools:** Unity, C#, Unity ML-Agents Toolkit

### INTERACTION FIELDS
- **Goal:** Use a force field to guide crowds.
- **Implementation:** This was an effort to study how an interaction field that exists in the environment can be used to guide crowds. We used Reinforcement Learning to train a force field instead of individual agents, which guides multiple agents from a starting point to a goal.
- **Results:** It is more efficient to train individual agents.
- **Tools:** Unity, C#, Unity ML-Agents Toolkit

### VISUAL COMPUTING PROJECTS *, Tools: C++, OpenGL, Python, OpenCV*
- Created a 3D scene with cars in OpenGL, in which the lighting and materials were set and the user can manipulate the movement of the cars and of the camera.
- Implementation of the Canny Edge Detector Algorithm to detect the edges in a picture using Python and OpenCV.
- Composition of a panorama from two different images that illustrate the same 3D scene from slightly different viewpoints, using the RANSAC algorithm in Python and OpenCV.

### AI PROJECTS *, Tools: C, Java, Python*
- Implementation of Neural Networks using Back Propagation for the XOR problem and for the recognition of handwritten letters.
- Implementation of a Neural Network using the Kohonen (unsupervised learning) algorithm for clustering the data of handwritten letters.

### OBJECT-ORIENTED PROGRAMMING PROJECTS *, Tools: Java, Eclipse IDE*
- Implementation of an adapted version of the Battleship game where the user plays against the computer.
- Implementation of a simulation that takes place in a 2D environment where ants, termites and wood exist following the given rules.

# languages

**Greek**  *Native proficiency*
**English**  *Full professional proficiency*, IELTS (Overall Band Score: 7.5)

# honors & awards

**Evagoras and Praxandros Scholarship - Department of Computer Science** *(University of Cyprus)*
This scholarship covered the tuition fees for the Master of Science in Computer Science
**Highly Skilled Workforce Scholarship** *(University of Edinburgh)*
This scholarship covered the tuition fees for the Degree of Master of Science in Theoretical Physics

# interests

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| Video Games | Digital Art | Drawing | Astronomy |
| Digital 3D Sculpturing | Animation | Handmade art | Interior Design |