

**Bedrijf / opdrachtgever :** Smart ICT

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**Aantal medewerkers:** 25

**Aantal IT medewerkers:** 23

**Aantal technische begeleiders:** 4

**Afstudeerrichting:** Applicatie-ontwikkeling - AI & Robotics

## **Opdracht**

ArtiFISHal Intelligence 2.0

For our recently created educational program in AI & Robotics, we are in need of a sandbox environment to provide our students a place to test newly learned techniques. To make things interesting and comprehensive, this environment must support visual output. This way, the techniques used can be evaluated more easily and the framework can be used as a demo showcase as well.

The real question is: are you ready to create life?!

A basis has already been created last year for the 1.0 version of this internship. The focus has shifted slightly. In essence, this project is all about agents and their behaviour. The visual sandbox environment exists and currently supports multiple agents powered by a number of Reinforcement Learning techniques and Evolutionary Algorithms.

The visual element consists of an artificial aquarium where the agents are fish. Currently, their only task is finding the best way to get to the food, dropped in from above. As this is only a basis, there is a lot of room for improvement and extension.

In this internship, you will continue to work in this sandbox environment. There is an emphasis on easy accessibility and configurability to experiment with, along with thorough documentation, for the purpose of usage by our future students.

The resulting demo showcase will be displayed in the PXL AI Hub at Corda Campus.

## **Extra Info**

The environment is developed in Unity and written in C#. A shortlist of possible extensions to the existing framework includes:

- Combined experiments with different agents (predators, “prepared” agents, ...)
- External adversaries (fishing lines + recognition)
- Reinforcement learning using long short-term memory (LSTMs)
- Continuous evolution in a dynamic multi-agent environment
- Model-free solutions and agents
- ...

## **Omgeving**

Programmeren: .Net, Andere

## **Randvoorwaarden**

A strong knowledge of C# and the basics of Reinforcement Learning is required for this assignment. As the environment has been developed in Unity, knowledge of that development platform is a big plus. However, a driven and inquisitive student can learn how to use Unity from scratch.

The thesis can be written in English, but this is not an absolute requirement, Dutch is an option as well.

## **Onderzoeksthema**

Your research will be focused on Reinforcement Learning and Evolutionary Algorithms, techniques that can be used to define the behavior of agents in the demo case.

**Inleidende Activiteiten:** Sollicitatiegesprek

**Aantal studenten:** 1 student

**Aanwezig op het Handshake Event:**

**Stageopdracht voor:**

**Andere bemerkningen:**

Handtekening Stagebedrijf  
Steven Palmaers

Naam en handtekening stagiair