**Project Proposal**

**Project name:** ArtificialWorld

**Project vision and objectives:** To create an artificial world for testing and stimulating the evolution of a generic problem solving agent controlled by a neural network and evolved through the process of neuroevolution. This world will be used and expanded for further research into this field in the future.

**Project owner:** Eben du Plessis, 082 921 1659, [eben.duplessis@airbusds-optronics.com](mailto:eben.duplessis@airbusds-optronics.com)

**Project scope:** The following needs to be developed:

1. A GUI that allows interaction from the user. This will involve creating the world, changing parameters such as agent evaluation, movement patterns of agents, field of view of agents, simulation settings of the evolved agent, identifying and storing successful agents for reuse and so forth.
2. A 2-dimensional grid world that may contain obstacles. The world needs to be designed by the user for specific scenarios in order to create multi objective problems/constraint satisfaction problems.
3. Pre-coded agents of different types. There will be “hunter” agents threatening the evolving agent and there will be “prey” agents that must be captured by the evolving agent. Negative and positive rewards must be awarded to the evolving agent in accordance with its success in dealing with the above stated agents. All agents must be able to move in different directions on the grid world.
4. A simulation of the evolving agent interacting with the world. The agent will have to “see” the world, in other words form an internal representation of the surroundings of the observable part of the world from its egocentric point of view.
5. Interfaces of the world with the evolution engine and the evaluator.

**Architectural requirements:** The program must preferably run on a Windows PC, coded in C++. In future it may be needed to run the program on a GPU.

**Project deliverables:** The following must be delivered:

1. Well commented Source code.
2. Executable.
3. Documentation (Requirements, architectural and detail design, acceptance test, installation manual).

**Client commitments:** The client will be available for any amount of time necessary to make the project a success provided that it will be after hours. The client will also supply notes and diagrams as input to the design team.