# Using Interactive Computer Games for AI Research

## Case Study on WarCraft III

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Creating machines with the intelligence of humans is a dream of AI researchers. A relatively new approach to making this dream come true includes the studying of computer games. The main idea is that instead of directly creating an intelligent agent for the real world, one instead creates an intelligent agent for a less complex environment. When the agent is smart enough for the current environment, it is time to use a more complex one. By creating agents for increasingly more complex environments, one would approach the complexity of the real world.

Computer games are a good candidate for these (above mentioned) increasingly complexer environments because computer games exist in all kinds of complexities. Computer games also typically interact with human players, which at an early stage presents the agents with the problem of interacting with humans.

Blizzard Entertainment's real-time strategy game WarCraft III provides both a complex standard game-type where armies compete for victory, each controlled by either a human or the computer, and the possibility to create custom made game-worlds. WarCraft III has a few features that makes creating worlds and game agents extra interesting. Many games only provide a graphical tool to create game-worlds, but WarCraft III also provides the possibility to combine the graphical tool for creating game-worlds (maps) with the possibility to write code in the Jass programming language.

The project has included two attempts on implementing game-worlds and game-agents using WarCraft III. The first attempt was to implement the Wumpus world, in which an adventurer explores a cave in search of gold, while avoiding pits and the Wumpus monster. A fully operational world was created and a somewhat primitive adventurer agent. The second attempt was to create an agent that played a normal game of WarCraft III. This attempt focused more on exploring what design could be used to create a flexible agent than on making an effective implementation. The result of this attempt was an agent that trained an army of simple fighting units, using a flexible design, and send these units off to fight enemy units. The constructed agent needs a lot of improvement before it is any good at fighting, but the foundation for making a more advanced one is laid.