

Te Tuhi Video Game Machine

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Abstract

Te Tuhi Video Game Machine is software I wrote in 2007 to drive an art exhibit. Gallery visitors draw pictures on paper of the game they want to play, and the machine makes the game work.

1. Introduction

Te Tuhi Video Game System is not a game in itself; rather it creates games based on arbitrary images that it is given. To use it, you draw a picture of the game you want to play, and it will give you the game that you really drew. The software was originally written for an art exhibit using slightly specialised hardware, but it has been released under the GPL and runs on ordinary computers. It uses Pygame, PIL, and custom C extensions that allow it to evolve a playable game from a wide variety of pictures. This paper will discuss the techniques used (both refined algorithms and hacky heuristics) and cover topics such as image analysis, machine learning, and interface design. The game system hosts its own slide-shows, so a demonstration is built into the talk.

2. How it works

The machine splits the image into constituent parts, which it sorts into teams based on naïve ideas of similarity. It then concocts arbitrary rules for the behaviour and interaction of teams, and sets up agents to think on behalf of each image part, including the one that is you. It then plays the game by itself, at high speed, to see what will happen. If the game ends too quickly, or seems like it will never end, the rules are randomly adjusted. This continues until a game is found that finishes in about the right length of time, which is the only measure of “good”. This process is repeated several times in parallel on all available processors, and the most fit game is chosen. The minds of the agents were to have been fine-tuned, using a similar Darwinian process, but I left that switched off in the rush, and have not missed it.

Once a game is complete, instructions are presented to the player and the game begins. Usually the gameplay is terrible, but players are happy just to see their pictures wiggling about on screen. Some players play a meta-game, trying to figure out the machine by repeat drawings.

It uses Pygame, PIL, its own C libraries, PyYaml, and sounds from the freesound project.

Links

- Home page <http://halo.gen.nz/tetuhi>
- Mailing List <http://lists.nongnu.org/mailman/listinfo/tetuhi-vgs>
- Savannah project page <http://savannah.nongnu.org/projects/tetuhi/>
- Git repository <http://savannah.nongnu.org/git/?group=tetuhi>
- Sourceforge downloads <http://sourceforge.net/project/showfiles.php>