An Engineering Approach to Evolutionary Art

J.I. van Hemert
jvhemert@cs.leidenuniv.nl
Leiden Institute for Advanced Computer Science
Leiden University, The Netherlands

M.L.M. Jansen
mjansen@cs.leidenuniv.nl

Abstract

We present a general system that evolves art on the Internet. The system runs on a server which enables it to collect information about its usage world wide; its core uses operators and representations from genetic programming. We show two types of art that can be evolved using this general system.

In evolutionary art we strive for a system that creates art using the principle of evolution: The survival of the fittest, or in this case, the survival of the most beautiful. Often this goal is achieved using an evolutionary algorithm of some form. All systems share a common feature: Human intervention to determine what is nice and what is ugly, in other words, a user induced fitness function.

The evolutionary algorithm used here is a crossing between a genetic program and a generic evolutionary algorithm. Most of its features are from genetic programming, but it does not share the main paradigm of creating executable material that can be applied to many different inputs. We point the reader to [1] for all the details about the implementation of the system.

Most evolutionary art systems run on a single machine, which, in itself, is not a striking property, but the main restrictions these systems have is that they interact solely with the person behind the same machine. Even if such a system would be popular its output will not go beyond the user and her machine. Here we strive for a system that is accessible for many people at the same time, gathering information about the decisions these people make. All of this is made possible through the Internet and the common gateway interface (CGI).

The fact that the system is on-line all of the time helps us, the researchers, to get the assistance of many people. To be able to make statements on these decisions we require a large amount of data, because this type of research is based largely on subjective decisions. Normally we would have to search actively for subjects that are willing to assist in these experiments, but here they can voluntarily and anonymously visit the page on the Internet and use the system.

If we want to gain information on what the average person likes and dislikes, we need to record the actions of many visitors. Hence, we connect the system to a database that stores the paintings that have been presented to users that have visited. Using this we are slowly building up a gene bank of evolved art.

Although the gene bank of images is constantly changing we provide pieces of art that are currently ranked high.
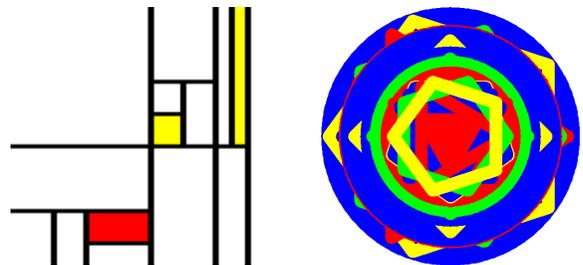

Figure 1: A Mondriaan (left) and mandala (right)

We invite the reader to visit our system on the Internet to fully experience its dynamics, it can be found at

http://www.liacs.nl/~jvhemert/eartweb/

References

[1] J.I. van Hemert and M.J.M. Jansen. An engineering approach to evolutionary art. Technical Report tr2001-01, Leiden Institute for Advanced Computer Science, Leiden University, 2001. http://www.liacs.nl/~jvhemert/publications/.