

# I'myth

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## Abstract

This paper presents an evolutionary computing system which generates images representing myths of human culture as synthetic identities. The myths are described by categorized terms, images and sounds, which are combined by genetic algorithms to produce new individuals with emerging features and behavior in real time. Objects are parametrically rendered in order to represent each myth, according to their genetic code managed by the artificial intelligence sub-system.

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**Keywords:** cyberart, artificial intelligence, genetic algorithms

## 1 Introduction

A cyberart object may have an internal mechanism which enables it to change or to be modified by an external factor such as user input. This project falls into the category of artificial complex system where new populations of myths are produced with the control of an artificial intelligence (AI) engine fed by data retrieved from the Internet. The following sections give an overview of the mechanisms used to represent and combine myths, as well as the techniques used to produce images based on genetic code.

## 2 The genetic representation of a myth

A myth is represented in our system by a set of chromosomes, each carrying a set of genes storing information categorized as:

1. adjectives: personal features, virtues and imperfections that are singular to the myth.
2. nouns: personal objects and items.
3. verbs: actions used to characterize personality.
4. places: cities and countries in that were associated with the myths life.

A search mechanism is employed to look for further information about each individual in the internet, using the terms stored as search keywords. This feature enables the system to feed itself with new information constantly, in an “exo” and “endo” process.

The evolution of the myth population is controlled by genetic algorithms (GA), which are search methods based on the genetic mechanisms of natural selection [Mitchell 2001]. The operators of mutation and crossover are used here to originate new populations. A fitness function defines the aptitude of each individual, employing the Noisy-OR method to take into account certain criteria established by the user. The new individuals created are stored and used to generate forthcoming populations.

By selecting certain objects and terms, users can determine which features should be considered as more important by the GA fitness function. When a new population is generated, a given number of individuals is selected for visualization. A proprietary computer graphics library (NTAV ROAMING) has been employed to render objects in real-time exploiting features such as dynamic meshing, morphing and blending, allied with lighting and texture synthesis. This library has also been used in previous work featuring in [Jones 2000].

## 3 Conclusion and Future directions

The mutant and evolutionary identity of myths configures a non-deterministic system that generates new individuals with original features and unique images. This computing system has been used to set up an installation which will be part of an art exhibition entitled “Art.ficial Emotions II” at Itau Cultural, Sao Paulo, Brazil (July 2004). Users interact with the system by selecting real objects with a barcode reader, while the images produced are projected onto two 2.5m x 2.5m walls. The combination of computer graphics and artificial intelligence has proven to be very fruitful in creating an environment which merges actual and virtual realities. Our next challenge will be to transform the features of the synthetic individuals in adaptive morphologies and narratives that reveal emergent behaviors inherent to humans, such as courage, speed and aggressiveness.

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