Graphic design is aimed at solving a number of problems:

1. Sell a product, attract a customer.

2. Form a high-quality artistic environment.

3. Feel responsible because graphic design – forms tastes and affects a person's life [1].

The purpose of graphic design is to visualize information intended for mass distribution through printing, film, television, as well as the creation of graphic elements of the subject environment and products.

Graphic design is one of the most important means of communication in the modern world. For successful promotion of goods on the market, it is necessary to understand the laws, principles and features of the visual language of graphic design of packaging, to be able to use them correctly in order to increase the effectiveness of advertising campaigns and increase sales of products.

So, modern graphic design is a dynamically developing area of professional activity, to which the interest of youth is constantly growing from year to year.

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Студ. Н. Н. Бовкун
Науч. рук. ст. преп. Е. В. Кривоносова
(кафедра межкультурных коммуникаций и технического перевода, БГТУ)

NATURAL SELECTION PORTRAYED BY AI

So, what is the natural selection and how is it connected with programming?

Natural selection is the process whereby organisms better adapted to their environment tend to survive and produce more offspring. The theory of its action was first fully expounded by Charles Darwin, and it is now regarded as be the main process that brings about evolution.

It means that the more you are adapted to your environment the more progeny you will have. This is the index of success (at least in biology). Being adapted means being able to survive for quite a long time and to produce another life. That will be requirements for our program. The envi-

ronment is the world with natural ways of getting food (energy). Bots that can: move, produce energy, be progenitive, mutate, die [1].

In programming it is called genetic algorithm. It is used to solve different problems with lots of attempts made by bots. Every time they become more and more productive until they get the result with the shortest and easiest way.

Genetic algorithms vary in their structure based on their purpose, but all of them share a few common components. The algorithm begins by initializing a population of individuals using default or random values. Then, it runs each member of that population through a fitness function. It selects the fittest members of the population to reproduce using a method defined in the reproduction function, then repeats the evaluation and reproduction until a desired number of iterations have passed. At termination, the algorithm presents the best member or members of the population according to the fitness function [2].

We will take a look at one example of a genetic algorithm. It has one-cell bots with 64 values in its memory. These values will control their behaviour. When bots multiply one in four children will have a mutation. This way if mutated bot is better than its father it will start a new branch of evolution and it will just die (sooner or later) if it is worse.

The process of natural selection starts with the selection of the fittest individuals from a population. They produce offspring which inherit the characteristics of the parents and will be added to the next generation. If parents have better fitness, their offspring will be better than parents and have a better chance at surviving. This process keeps on iterating and at the end, a generation with the fittest individuals will be found. We will take a look at the model of lake. Bots will be able to produce energy by minerals on the bottom of it and by photosynthesis on the top. Also they can eat each other and dead bodies (first bots can not do it but it may be reached by evolution) [3].

First bots are placed in the middle layer, so it will be able to get energy both ways. Its children may go down and safely eat minerals. Or they may battle with parents for sun. Later they may become predators and hunt others on the best spots. This amount of variants is fascinating. It all is made just for a child interest.

After some tries we see that the world is always full of bots. Those who live on top never try to get lower, and the same for guys from top. Predators always follow groups of bots. Mostly bots try to live in huge groups of different shapes (depends on type of food they eat). These "fami-

lies" are made by bots with the same or similar code and behavior. Sometimes appears dominating type of bot and it captures all the word. Others have to die or change its behavior basing on dominating bot type. Just like in real world [4].

Let us describe some examples what it looks like in program. The source is YouTube channel "foo52ru" [5].The first bots try to find their place in the new world. The top is populated by photosynthetic bots. Predators live higher to catch those who want more sun. To avoid predators bots moved to the bottom of the world. The border appeared between bottom and top, and the world was divided, lots of predators moved to the bottom, a huge colony appeared on the top. There are some predators in it. Soon they will be a dominating sort. That was the example of no-DNA bot gene, but also there is another type of bots. They have DNA lines of commands and it makes a big difference. First there must be two parents to get progeny. The type of gene inheritance is completely different. It is called a crossover. In biological terms, a crossover is nothing but reproduction. The point of crossover is chosen randomly. Then the genes of both parents are mixed. This way child bot has more than one different gene and it is without of random mutation. This method is used to get the correct result in minimal amount of steps, but it is worse if you try to reproduce the biological system. Such bots will not make groups and families. Most of children will not be able to reproduce and their lifespan will be shorter. But evolution of these bots will be much faster. Best of children will supersede their parents in a short time and the chance to get an "alpha" bots is much higher. The biggest problem appears with first predators. The strongest of them will kill all others form of life and lose all the sources of energy (of course if they do not kill each other on the start stage). It may cause a total die out. Mutation is added to make it more interesting (and more random). It works the same with our previous example, one gene is randomly changed. Mostly it produces groups of predators or fast-dying bots. Genetic algorithms are widely used in computer science. Most high-level programming competitions are won by genetic algorithms. Path-finding programs make use of something similar to it. The most interesting that biologists do not use it because it is too hard to program all the needed conditions, but maybe in future genetic algorithms will be able to simulate our world completely and we will see how the evolution will kill us. Or not. Who knows…

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УДК 66558

Студ. Д. В. Бутель
Науч. рук. преп. Е. А. Петровская
(кафедра межкультурных коммуникаций и технического перевода БГТУ)

CHEMICALS IN COSMETICS: ARE THEY SAFE?

There are many chemical compounds used for the production of cosmetics. Cosmetics are made from a range of ingredients which are the so called industrial chemicals. Industrial chemicals may be synthetic chemicals or naturally occurring processed chemicals. Let's talk about some of them:

Water. Water is primarily used as a solvent in cosmetics and personal care products in which it dissolves many of the ingredients that impart skin benefits, such as conditioning agents and cleansing agent.

Formaldehyde. Formaldehyde and formaldehyde-releasing preservatives (FRPs) are used in many personal care products, particularly in shampoos and liquid baby soaps. It is found in very low amount in many consumer products like cosmetics and personal care products.

Emollient. Emollients soften the skin by preventing water loss. They are used in producing of lipsticks, lotions and other cosmetics. A number of different natural and synthetic chemicals work as emollients, including beeswax, olive oil, coconut oil and lanolin, as well as petrola-