

Artificial Intelligence Assignment 2

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Introduction

In this task we are asked to generate image 512×512 pixels using some input 512×512 images via evolutionary algorithm.

Description of algorithm

Pseudocode for my implementation:

```
1: Create 10 blank black images
2: for each blank image do
3:   Place '*' character in random place with random colour
4:   Calculate fitness value
5: end for
6: Sort images by fitness value
7: for number of generations do
8:   Save the best half of images
9:   for each saved image do
10:    Place new '*' character in random place with random colour
11:    Calculate fitness value
12:   end for
13:   Sort images by fitness value
14: end for
15: Save image with the best fitness value
```

- Chromosome representation:
 - Chromosome is '*' character and genes of this chromosome are coordinates on image and RGB colour.
- Population:
 - Population size is 10.
 - Selection technique saves the best half of the population, while other half "dies", and creates new members using mutation to again get population size equals 10.
- Fitness function:
 - Fitness values is calculated using difference between original and current image, calculating statistics for resulted difference and finding mean value of resulted statistics.
- Mutation:
 - Mutation is placing new '*' character in random place with random colour.

Examples

Let us consider examples of generated images.
On the left side original image, in the center generated image with 200000 generations, on the right side generated image with 500000 generations.

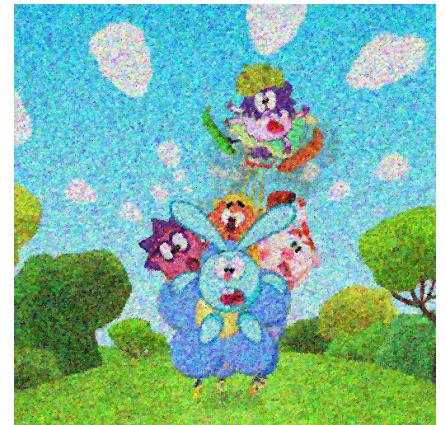


Figure 1: Smeshariki

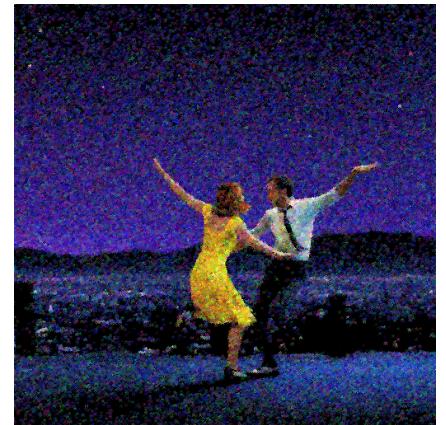
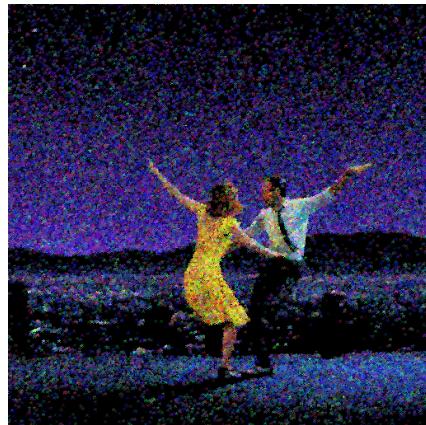


Figure 2: La La Land

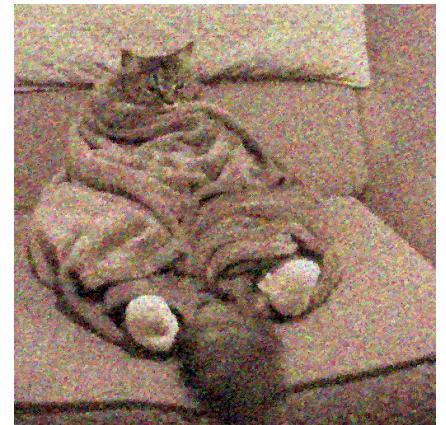


Figure 3: Lazy cat

As we can see, with larger number of generations image becomes more and more similar to the original image but consequently it takes much more time to execute. For example, on my PC image with 200000 generations creates in approximately 40 minutes but with 500000 generations in approximately 2 hours.

Conclusion

In my opinion, art is some human creation that person creates in order to express feelings or thoughts. It can be painting, music, book, sculpture etc. For instance, when painter sees beautiful landscape he/she wants to capture that view. Or if writer has thoughts about some problem he/she writes a book. And there are more and more examples.

Therefore, I do not think that generated image is art because program just copies already existing image and does not try to express its feelings and thoughts through it. If my program generated something by itself, then I might think that it generates art, but now I am sure that this is not art.