

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: for each pixel of 512×512 image do
2:   Generate random colour of '*' character
3:   Calculate its fitness
4:   Save this member of initial population
5: end for
6: Sort initial population by fitness value
7: for specific number of generations do
8:   for each member of the worst half of population do
9:     Randomly change one of the colour channel
10:    Recalculate fitness value
11:   end for
12:   Sort population by fitness value
13: end for
14: Draw resulting population on blank image
```

- Chromosome representation:
 - Chromosome is '*' character and genes of this chromosome are fitness value, coordinates on image and RGB colour.
- Population:
 - Population size is 262144 for each pixel on image only one '*' character.
 - Selection technique saves the best half of the population, while other half mutates and gets modified colour.
- Fitness function:
 - Fitness values is calculated using root mean square approximation between between colours of specific '*' character and pixel on original image on the same position.
- Mutation:
 - Mutation is random change of one of RGB channels of '*' character.

Examples

Let us consider examples of generated images.
On the left side original image, on the right side generated image after 100 generations.

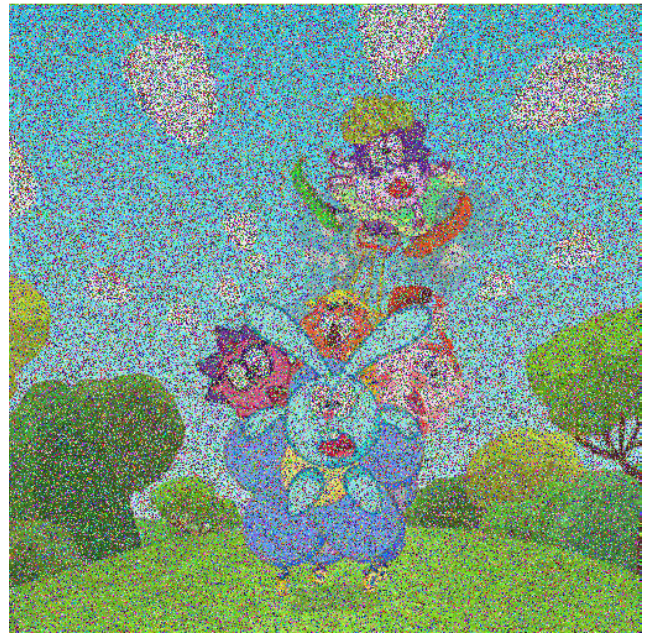


Figure 1: Smeshariki

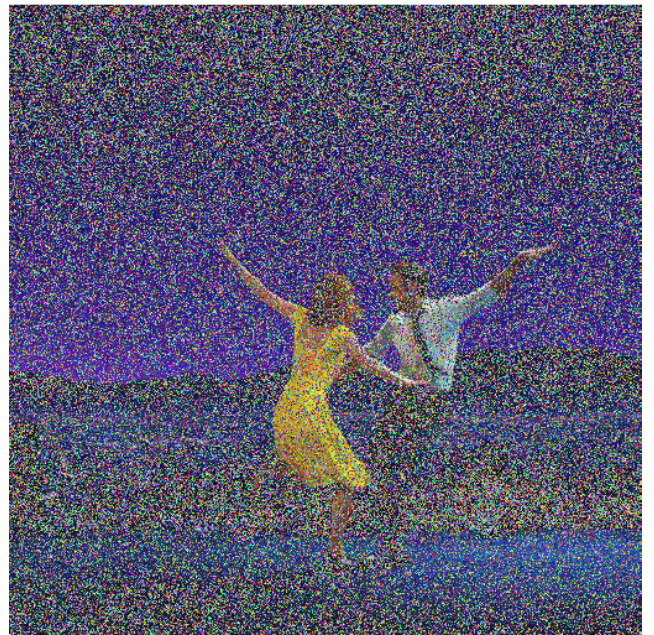


Figure 2: La La Land



Figure 3: Lazy cat

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.