

# Computational Art & Evolutionary Algorithms

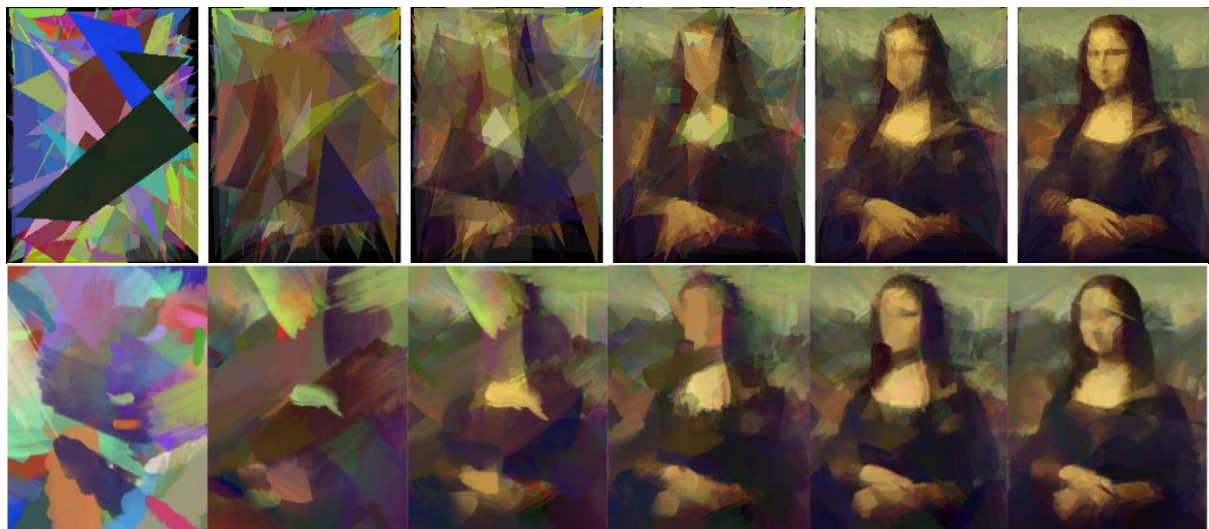
15-48 EC masters' thesis project

For: Master Students that know how to program - and are interested.  
If you've ever done a course in heuristics, it is a pre.  
Load: 15 - 48 EC, depending on blocks (see below)  
Period (approx.): From September 2021 onward  
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Introduction video: <https://bit.ly/3DWGFrG>

## About the project

Computational Art is a relatively new field in which many different sorts of publications appear. Students of UvA have delivered contributions, but along very specific line, treating image approximation (by polygons or paint strokes) as an optimization task. So while the end product might be aesthetically pleasing, the true knowledge is in the performance of the algorithms.

In this project, we'll further our knowledge about these algorithms, and about the approximation possibilities.



*Figure 1 (Top; Adapted from Paauw & Van den Berg) Optimally arranging polygons to approximate a famous image. But how good is the algorithm? (Bottom; courtesy Danny Dijkzeul)*

Each block is about 15-18 EC's worth. You can choose blocks to your liking, though there is a strong emphasis on doing Block #1 first. Generally, we can adapt blocks as we go along, but once a block is finished, we're not going back, only forward.

### **Block #1**

Start by reading Paauw & VandenBerg's paper [1], and Dahmani et al.'s paper [2]. Get their sourcecode to run, and try to understand how simulated annealing works. See if there is a way to test Dahmani's proposition about the average temperature and whether we can test it. The experimental part in this block might be relatively sizeable, so once you have some progress, we'll sit and discuss.

### **Block #2**

In the paint stroke experiment by Danny Dijkzeul [3], simulated annealing outperformed both other algorithms. See if different parameterizations for his simulated annealing improve or deteriorate the performance.

### **Block #3**

Is it possible to *evolve* good parameterizations? Think of something, start with a few small experiments and expand later.

### **References**

[1] <https://bit.ly/2WXA8p>

[2] <https://bit.ly/3yHtF5A>

[3] Unpublished at the time of writing; mail me for details