Evolutionary Art

No Institute Given

Abstract. <Text of the summary of your article>

1 Introduction

This paper is organized as follows: In the next Section, a brief review on Evolutionary Art is presented.

2 Evolutionary Art

Creative evolutionary systems are used to evolve aesthetically pleasing or innovative structures [6].

2.1 Art Representation for Evolutive Art

– alalala

2.2 Aesthetic measures for evolutive art

MAIN CHALLENGE -> HOW TO MEASURE AESTHETICS.

Definition Two modes of aesthetics measures can be defined [7]:

1. *Aesthetics evaluations are expected to simulate, predict or cater to humans notions of beauty and taste.*
2. *Is an aspect of meta-aesthetic exploration and usually involves aesthetic standards created by software agents in artificial worlds.*

According to Galanter [7], computational aesthetics measures can be classified in the following categories:

– Based in Design Principles. Like the rule of thirds or theory of color (e.g., opposite colors) [4].
– Based in Neural Networks and Connective Models.
– Based in Evolutionary Systems:
  - Interactive Evolutionary Computation. The fitness of the individuals is determined by human agents.
  - Performance based goals. Certain properties of the art piece are evaluated and optimized based in performance measures (e.g., usable surface in furniture design generator).
  - Error relative to Exemplars. The individual fitness is measured using a real-world example (e.g., a photography or painting) [6].
  - Complexity measures. This type of measures is based in the idea the complexity is directly related to aesthetics, following the path firstly stablished by Birkhoff [1].

  - Multi-objective. Given the multidimensional nature of aesthetics judgement, multi-objective EAs are a clear option in order to deal with this multidimensionality.
  - Extensions to EA (such as, coevolution, agent swarm behavior, etc.).
- Complexity Based Models

En [8], Li et al. proponen las siguiente métricas para el aprendizaje estético:

- Color ingredient.
- Image complexity.
- Image order.
- MC metric.
- BL Metric.

En [5], presenta una comparación de tres métricas estéticas:

- Benford Law.
- Global Contrast Factor.
- Information Theory.

En [2], presenta una comparación de cuatro métricas estéticas:

- Machado and Cardoso.
- Ross and Ralph.
- Fractal Dimension.
- A weighted sum of the above mentioned metrics.

En [3] se presenta una aproximación multi-objetivo para arte evolutivo. Las tres funciones de fitness utilizadas son:

- Benford Law.
- Global Contrast Factor.
- Ross and Ralph (bell curve).

En [4] se presenta un AE para crear arte evolutiva a partir de imágenes vectorizadas. La función de fitness utilizada es la diferencia de tono entre distintas regiones de la imagen a distintas resoluciones.

En [6] they present an automatic fitness function specific to portrait painting based in four scores:

- Resemblance.
- Composition (face vs background).
- Tonality.
- Color.

3 Genetic Operators

3.1 Representation

3.2 Initialization

3.3 Mutation

3.4 Crossover

3.5 Fitness Functions

Histogram HISTOGRAMA DEF: a graphical representation of the tonal distribution in an image.

Image Matching

4 Experimental Results

5 Conclusions and Future Work

References

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