2015

Nature Inspired Form Finding Strategies
Assessment using Genetic Algorithms

Antoniou, Dimitrios

IEEE Computer Society

http://hdl.handle.net/11728/6655

Downloaded from HEPHAESTUS Repository, Neapolis University institutional repository
Title: Nature Inspired Form Finding Strategies Assessment using Genetic Algorithms

Year: 2015

Author: Demetris Antoniou, George Artopoulos, Nikolaos Bakas, Joakeim Liassides, Nikolaos Varlagkas, Giannis Georgiou, Katerina Demetriou, Savoulla Karagiannidi

Abstract: In this work, several topology generation procedures have been implemented on architectural surfaces combined with urban forms. Delaunay triangulation, Voronoi diagrams and the recently proposed [1, 2, 3] Voronax diagram, assessed in terms of nature adaptive forms. This is achieved using structural analysis criteria such as mean and maximum compressive stresses in each step of the optimization procedure. The methodology is based on a robust genetic algorithm [4] connected with structural analysis software [5] and form finding code, while their interconnection establishes the proposed framework for generative solution of form finding complexities. Several general three and two dimensional artifacts have been analyzed and designed using the proposed methodology. The suggested approach and the results achieved constitutes a novel framework for such issues.