

A new form-finding method for shell structures based on BESO algorithm

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Abstract

Due to high efficiency and elegant geometry, shell structures are widely used in architectural and structural designs. This paper presents a new numerical structural form-finding method for the design of shell structures based on bi-directional evolutionary structural optimization (BESO) algorithm [1]. This technique can perform shape and topology optimization interactively to find designs with efficient structural performance, complex and elegant geometries, and other features that are of interest to architects and engineers. Diverse designs from the optimization process as a result of using different BESO parameters will also be discussed. Finally, some excellent projects, e.g. Palazzetto dello Sport by Nervi [2], will be introduced as a reference group to make a comparison with the innovative results produced by the new BESO method.

References

- [1] X. Huang, Y.M. Xie, *Evolutionary Topology Optimization of Continuum Structures Methods and Applications*, John Wiley & Sons, 2010
- [2] S. Adriaenssens, P. Block, D. Veenendaal and C. Williams (eds.), *Shell Structures for Architecture: Form Finding and Optimization*, Routledge, 2014.