World Academy of Science, Engineering and Technology
International Journal of Architectural and Environmental Engineering
Vol:15, No:02, 2021

Knitting Stitches' Manipulation for Catenary Textile Structures

Authors : Virginia Melnyk

Abstract : This paper explores the design for catenary structure using knitted textiles. Using the advantages of Grasshopper and Kangaroo parametric software to simulate and pre-design an overall form, the design is then translated to a pattern that can be made with hand manipulated stitches on a knitting machine. The textile takes advantage of the structure of knitted materials and the ability for it to stretch. Using different types of stitches to control the amount of stretch that can occur in portions of the textile generates an overall formal design. The textile is then hardened in an upside-down hanging position and then flipped right-side-up. This then becomes a structural catenary form. The resulting design is used as a small Cat House for a cat to sit inside and climb on top of.

Keywords : architectural materials, catenary structures, knitting fabrication, textile design
Conference Title : ICDA 2021 : International Conference on Digital Architecture
Conference Location : London, United Kingdom
Conference Dates : February 15-16, 2021