BeTA Pavilion [Biotensegrity Textile Assemblies]

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Abstract

Born in art, the tensegrity logics has been advanced in disciplines from architecture and human anatomy. Biotensegrity principles introduce an adaptive, 'living' structural model characterized by networks of interconnected components and tendons with a shape adaptive capacity. Bending-active is an approach to form force equilibria that adopts actively curving beams and surfaces within their elastic ranges.

BeTA Pavilion explores the formal opportunities of biotensegrity logics using elastically bent glass fiber reinforced plastic rods and CNC kitted textiles. Its bending-active systems (inspired by vertebrae typologies) is comprised of pre-stressed and self-stabilized tetrahedron modules that are arrayed and sequenced to produce structural equilibrium with a bandwidth of dynamic motion.

This paper will summarize the conceptual development, material detailing, fabrication and iterative form-finding processes for the pavilion formulated through systems thinking.

References

[1] R. Liu, and D. Davis-Sikora, "Form-finding of an ecological "green" wall using bending-active biotensegrity structure," in Architecture of Complexity - Design, Systems, Society and Environment: Proccedings of the ARCC Annual Symposium 2017, Salt Lake City, Utah, USA, June 14-17, 2017, R. Smith; K. Diaz Moore, and W. Zhao (eds.)