

A new T4 configuration for a deployable tensegrity pavilion

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Abstract

The present tensegrity pavilion project is developed within a collaboration between University of Bergamo and the Italian company Tensoforma, with students working as interns during the realization of the structure.

This tensegrity pavilion explores the competition between form and balance of forces. The aim of this work is to design, manufacture, and assembly a self-stressed tensegrity structure composed by four bars and only one continuous cable.

Such cable is divided into fixed-length segments connected to the bars' ends, plus a variable-length segment running through the last node. By using a hydraulic jack to pull such cable segment, a self-stress state is established in the whole system, simultaneously erecting the structure. An outer structural membrane contributes to the global balance of the system. The pavilion is constrained to ground by simple supports and pinned connections, without transferring prestressing forces.

This pavilion can be considered a generalized tensegrity system, with its membrane running along structural elements other than being connected at their ends. The peculiarities of this system are introduced and analyzed here as a starting point in the design of more complex structures.

References

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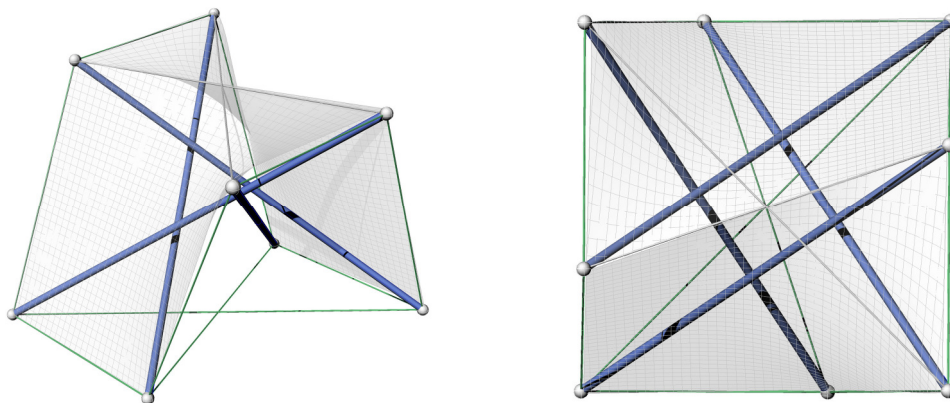


Fig. 1: Axonometrical (left) and top (right) views of the tensegrity pavilion