# Comparative Structural Evaluation and Analysis of Modular Deployable Structures of Expandable Frames.

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**Abstract**

Deployable structures of expandable frames, commonly known as scissor or pantographic structures, are collapsible assemblies that can be easily expanded to activate a particular space or contracted into a compact, transportable configuration. The geometric rules that govern the design of deployable structures of expandable frames have been extensively documented. Architects and researchers such as Felix Escrig, Sergio Peregrino, and Charis J. Gantes have catalogued the morphology of these type of structures and described the geometric requirements for them to fold and unfold. However, the relative structural performance of these modular designs has never been compared in a single study. The extensive number of geometrical alternatives and the lack of evidence-based information regarding their general structural behaviour presents a challenge to new designers looking for the most efficient design for a specific set of conditions. This study represents an attempt to evaluate the structural performance of different geometries of deployable structures of expandable frames. The paper will produce evidence-based guidelines that will allow future design professionals to determine the adequacy of different configurations for deployable structures.