

## **States of self-stress in symmetric frameworks and applications**

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In 2000 Fowler and Guest established a symmetry-extended Maxwell rule for the rigidity of (bar-joint) frameworks. This rule can often reveal ‘hidden’ infinitesimal motions and states of self-stress in symmetric frameworks that cannot be detected with Maxwell’s original rule from 1864. In this talk we show how this rule can be used to derive an efficient new method for constructing symmetric frameworks with a large number of ‘fully-symmetric’ or ‘anti-symmetric’ states of self-stress. Maximizing the number of independent states of self-stress of a planar framework, as well as understanding their symmetry properties, has important practical applications, for example in the design and construction of gridshells. We show the usefulness of our method by applying it to some practical examples.

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