

Frameworks in motion: from theory to design and back again

Jessica Sidman

What do your umbrella, a folding gate, and a scissor lift have in common? They all involve frameworks made of rigid parts attached at flexible joints and are designed to move with one degree of freedom. In 1981 architect Santiago Calatrava wrote a PhD thesis, "Concerning the Foldability of Space Frames," containing a systematic exploration of the geometry and design of foldable frameworks. I'll discuss some of his constructions and the clever ways he built them and then use his thesis as a jumping off point to explore the Laman-Pollaczek-Geiringer Theorem.