Institut für Geometrie

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Interactive Design with Nonlinear Constraints

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Industrial and architectural design processes must respect both performance requirements and fabrication limitations, but have to offer the maximum possible creative freedom. In our work we model this situation as interactive exploration of constraint spaces guided by fairness energies, and implement it by an iterative Newton method made feasible by conversion of polynomial constraints to linear or quadratic ones.

We demonstrate different applications to computational design problems which could not be solved before, such as meshes which obey side-conditions originating in both geometry and statics. Another instance is developable surfaces, including curved-crease origami, and sketch-based design.

References: C. Tang et al, *Form-finding with polyhedral meshes made simple.* SIGGRAPH 2014.

Johannes Wallner