

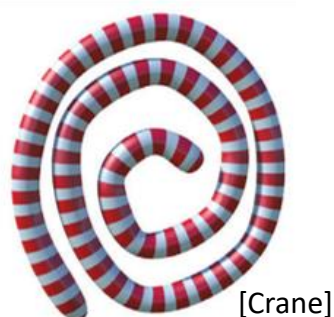
## Masterarbeit:

### Shape Optimization for Beam-Like Structures using Vertex Morphing in Kratos

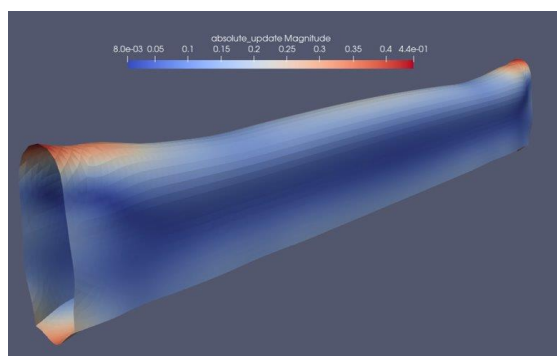
Vertex Morphing is a free-form, node-based parameterization and shape optimization method using gradient-based algorithms. It has emerged as a powerful tool for engineers to optimize thin-walled structures and is already extensively applied in automotive industry, but still widely unknown in civil engineering. In order to make the method more practical in the field of civil engineering, the free-form parameterization shall be reformulated and constrained to beam structures with thin-walled cross sections, e.g. hollow profiles.

This could be realized by constraining the free-form optimization to two processes:

- optimization of the beam centerline
- optimization of the cross-section shape



[Crane]



For both processes it is crucial to develop an automatic computation of the beam centerline. That could be, for example, achieved by the heat method [Crane], which is able to compute geodesic and biharmonic distances on the surface.

In order to optimize the centerline shape, a mapping between surface and centerline has to be established. And, for improving the cross-section shape, the Vertex Morphing filter have to be adjusted.

Basic knowledge in C++ and python are essential for a successful work with Kratos Multiphysics.

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Bearbeitungs-

sprache:

Starttermin:

Deutsch oder Englisch

variabel