Aerospace Structures & Computational Mechanics
Ph.D. Seminar Series

Dr. Dan Wang

Shape optimization of openings on thin-walled curved surfaces

As an important kind of lightweight and load-carrying structures, thin-walled curved surfaces are widely used in aerospace engineering. The work is concentrated on shape optimization of openings on thin-walled curved surfaces. Different from existing shape optimization of 2D planar curves and 3D free curved surfaces, shape optimization of openings on curved surfaces has to make sure that every point of the opening contour is strictly attached to the prescribed surface during the whole design process. To avoid solving plenty of nonlinear equality constraints, two different methods named the Parametric Mapping Method (PMM) and the virtual punching method (VPM) are proposed to represent the spatial opening contour explicitly and implicitly, respectively. Then, an optimization problem with both designable shapes of the curved surface and the hole boundary curve is solved by a moving bounds strategy. Finally, an efficient material perturbation method (MPM) is proposed to carry out shape sensitivity analysis and the new method is validated by typical numerical examples.

time: **Tuesday, February 11th, 2014, 16:00**
location: **meeting room 7**
organization: **Dr. Martin Ruess ‹m.ruess@tudelft.nl›**