Iso-contour method for optimization of steered-fiber composites

Abstract:

The research presented in this paper is focused on a method for optimization of fiber-steered composite shell structures. The main idea of this method is related to the levelset method: in order to steer the fibers, iso-contour lines of an artificial hyper-surface, defined over a 2D geometry domain, are used. Thus, the smoothness of this artificial surface can guarantee continuity/smoothness of the obtained fiber paths. This can be used to create manufacturable steered fiber composites. Finally, by modifying this artificial surface, we can control the fiber paths and optimize the design of a composite part for the specific needs.