

**Both positions and weights of NURBS control points are considered as design variables  
in Isogeometric shape optimization**

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NURBS(Non-uniform Rational B-spline) is an effective shape optimization technique due to its accuracy and efficiency on integration of structural modelling of CAD and numerical analysis of CAE. NURBS represents shape with both control points positions and weights and weights enable conical shape representation such as circle etc. But most of shape optimization studies considered only control point positions as design variables. In some shape optimization processes, control points are located in the limited space. This deteriorates mesh quality and hampers the convergence. In present work, a new 2D Isogeometric shape optimization algorithm is proposed. This algorithm considers not only control point positions but weights are used as design variables. Because control points positions and their weights depend on each other, this work separately uses two parameters during the optimization steps. The proposed optimization algorithm has advantages in conical shape representation and flexible shape representation for location of control points in the limited case.

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