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ADVANCES ON T-SPLINE PARAMETERIZATION BASED ON THE MECCANO METHOD

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We have recently introduced a new strategy, based on the meccano method [1, 2], to construct a T-spline parameterization of 2D and 3D geometries for the application of isogeometric analysis [3, 4]. The proposed method only demands a boundary representation of the geometry as input data. The algorithm obtains, as a result, high quality parametric transformation between the object and the parametric domain, i.e. the meccano. The key of the method lies in defining an isomorphic transformation between the parametric and physical T-mesh finding the optimal position of the interior nodes, once the meccano boundary nodes have been mapped to the boundary of the physical domain. A procedure for simultaneous untangling and smoothing of T-meshes is applied to reach this objective. Bivariate or trivariate T-spline representations are calculated by imposing the interpolation conditions on points sited both in the interior and on the boundary of the geometry. The proposed method also permits modeling of objects with embedded geometries that can be used for domains composed of different materials. In this paper we present new advances of the proposed technique. In addition, its effectiveness is shown in several examples. Some results of the application to isogeometric analysis are also presented.

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