

Cloth drape simulation based on a rotation-free triangle

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In this paper, a rotation-free triangle previously developed by the authors is employed for cloth drape simulations. The triangle possesses no rotational dof. It is developed based on a six-node quadratic interpolation of transverse deflection using an overlapping element concept and is extended to large displacement/rotation analyses by using a corotational approach. The present formulation is simple and efficient yet its accuracy is competitive with respect to other rotation-free triangles. In this presentation, dynamic simulations are emphasized. Several topics including a simple and efficient strategy to avoid the formation of non-physical folds, an adaptive remeshing scheme used and the collision treatment are highlighted. Simulation examples on cloth draping, skirt sewing and body movement are considered. Predictions conforming to real-life observations have been achieved and the practicability of the present computational scheme in cloth drape simulations is demonstrated.

Keywords: rotation-free; cloth; drape; remeshing; corotation; collision