

A CONTACT FRICTION ALGORITHM BASED ON A COULOMB FRICTION LAW TO SIMULATE THREE DIMENSIONAL MECHANISMS

Federico J. Cavalieri^a, Javier Galvez Buezo^b, Alejandro Cosimo^a, Alberto Cardona^a and Olivier Bruls^b

^aUniversidad Nacional del Litoral - CONICET, CIMEC, Colectora Ruta Nac 168 / Paraje El Pozo, 3000 Santa Fe, Argentina, fcavalieri@santafe-conicet.gov.ar, <http://www.cimec.org.ar>

^bUniversity of Liège, Department of Aerospace and Mechanical Engineering (LTAS), Chemin des Chevreuils, 1 (B52), 4000 Liège, Belgium, o.bruls@ulg.ac.be, <http://www.ltas-mms.ulg.ac.be>

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Abstract. This work presents a new frictional contact algorithm for the dynamic simulation of three dimensional multi-body mechanical systems composed by both flexible and rigid elements. The regularization of the variational friction contact problem is solved with a mixed dual formulation based on augmented Lagrange technique. After time discretization, the equation of motions are solved with a non-smooth generalized-alpha time integration scheme. In this algorithm, the unilateral and bilateral constraints are exactly fulfilled both at position and at velocity level. In addition, the numerical results do not depend on the definition of any user-defined penalty parameter for the normal or tangential force components. Finally, the robustness and behaviour of the algorithm are studied by solving several numerical examples.

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