A Survey on Contact Algorithms.

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Most of natural and technological processes deal with contact interactions of deformable/rigid bodies between themselves and with liquid and gaseous mediums. Therefore the studies on contact problems take one of the central places in Computational Mechanics.

Current review is based on about 300 papers, published worldwide during 1960-2002 and describes the basic ideas of contact algorithms, current state of the art and major research directions.

The topics of consideration are:

- history of contact investigations;
- contact boundary conditions and variational formulations;
- analytical contact studies;
- simplest contact algorithms: rigid boundaries, ideal contact, etc;
- global and local contact zone search algorithms;
- contact forces and velocities detection algorithms for 2D and 3D cases.
- contact friction and concurrent physico-chemical processes;
- cases of multiple contact and non-smooth contact surfaces;
- contact shape design optimisation;
- contact algorithms used with boundary and finite elements, finite volumes;
- contact algorithms for ”meshless” Bubnov-Galerkin methods;
- specific contact algorithms for bio sciences and image processing;
- vectorisation and parallelisation of contact algorithms.

Finally the approach to grid generation, which is based on contact algorithms, is highlighted.