Modelling Deformations in Car Crash Animation

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Abstract:

In this paper, we present a prototype of a deformation engine to efficiently model and render the damaged structure of vehicles in crash scenarios. We introduce a novel system architecture to accelerate the computation, which is traditionally an extremely expensive task. We alter a rigid body simulator to predict trajectories of cars during a collision and formulate a correction procedure to estimate the deformations of the collapsed car structures within the contact area. Non-linear deformations are solved based on the principle of energy conservation. Large plastic deformations resulting from collisions are modelled as a weighted combination of deformation examples of beams which can be produced using classical mechanics.

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