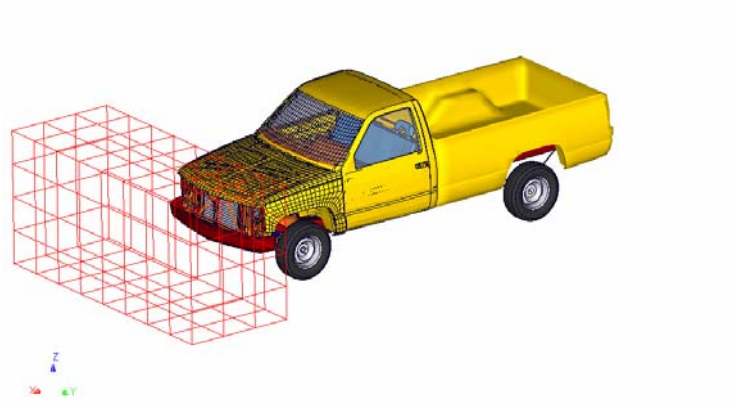# Virtual Reality in Crash Simulation

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ABSTRACT

Since simulation of complex things like crashing a car becomes more precise and more affordable its only natural that one wants to analyze the results in a way a humans nature can intake complexe data best: **visually**.

Virtual reality (VR) can be used in a number of fields and there are much more to evolve. For example:

–Transportation:

> car, truck, train, airplane, rocketscience, …

–CFD:

> Windchannel, optimisation of turbines,airflow in citys…

- FEM, Crash sim,…
- Fabshop planing and simulation
- Oil and Gas
- Chem/Pharm, Drugdesign
- Medicine, Radiology, Surgery training, volumerendering
- Education
- Museums, Art,…
- Entertainment, Fun parks ,Games
- Weather simulation, visualisation
- Large Data vis, I.e. n-dimensional DB models
- Sport, I.e Sim of Golf or other complex movements

Marketing and Sales.

The **Benefits** of using VR are obvious; saving of time and money trough:

- collaboration
- teamwork
- faster time to market
- faster decisions
- faster and better understanding of complex things
- insight
- less errors
- marketing/sales: advantage over competition

is essential !

Immersion can be also defined as „presence" or „suspension of disbelief".

Technology to improve Immersion:detailed data with haptic/sensoric3D sound, infrasound1 to 1 scale or even larger direct (no latency) interaction with dataheadtracking

- force feedbackIn Crash Simulation VR can used to visualize:
- visualisation of folding and change in material thicknes
- Behavier of dummys
- KinematicFoldings in sheet metalBending of complex assemblies Analyzing of vectors

Every VR System consists always of

- Imagegenerator from PC to Multipipe IMG
- Stereo Displaysystem
- Software: Applikation, Toolkits, Utilities

Optional parts can be

- Mediacontrol or Sound/Light Projection
- 3D Sound
- 3D Control (joystick, tracker, keyboard/mouse)
- Trackingsystems, force feedback systems

The market trend is to get more and more horsepower for less money. VR will become a commodity tool for collaboration, analyzing of complex data, decision making, and even marketing and sales.

Being „high tech" does not change human nature:
We need our senses to understand our surroundings and work.
We succeed in most activities because we collaborate with other people.