DYNA4 3.0 What’s New?

Quick Overview
- **GPU based sensor simulation**: Lidar, radar, ultrasonic, cameras and object list
- **Euro NCAP 2018 scenarios**: incl. cyclists and night scenarios
- **Seamless integration with HiL test platforms**: Easy export of vehicle and maneuver as run-time datasets
- **Interfaces** to ROS and ADTF for closed-loop function development
- **Platform support** of latest Matlab, dSpace, NI, Vector and ETAS versions
- **Range of model improvements** for tires, steering, energy analysis, traffic behavior
- **3D visualization** with DYNAanimation:
  - Many new objects including tunnel, motorcycles, bicycles, vehicles and road infrastructure
  - Automatic animation scene generation according to the selected scenario and vehicle model
- **DYNA4 Engine**: Combustion process and exhaust aftertreatment
- **Improved ease of use**
  - Enhanced usability with new perspectives
  - New preconfigured example projects for a quicker start

Sensor simulation: Physical simulation of environment sensors
- For development and test of ADAS/AD functions
- Physical modeling of ultrasonic, lidar, camera and radar sensors
- Automatic semantic image segmentation for all visible objects
- Receiver modules for function development in Simulink and ROS
- Maximum time and cost efficiency by calculation on the GPU of a standard PC

Details and videos: [www.tesis.de/en/sensorsimulation](http://www.tesis.de/en/sensorsimulation)

Euro NCAP 2018 scenarios
- Virtual test drives for AEB and FCW functions
- NCAP scenarios with pedestrians (CPFA, CPNA, CPLA) by day and by night
- NCAP scenarios with bicycles (CBNA, CBLA)
- NCAP vehicle scenarios with Soft Car (CCRs, CCRb, CCRm)
- Automated report generation

Details and videos: [www.tesis.de/en/ncap](http://www.tesis.de/en/ncap)

Seamless integration with HiL test platforms
- Easy export of vehicle and maneuver as run-time datasets
- Seamless integration in Vector Canoe node-layer dll and user files, dSpace ControlDesk datasets, ADTF filter
- Test engineers retain their preferred toolset, no DYNA4 knowledge necessary
- Run automated ECU tests without Matlab
- 3D visualization with DYNAanimation

Details and videos: [www.tesis.de/en/ncap](http://www.tesis.de/en/ncap)
**DYNA4 3.0 What’s New?**

### Interfaces to ROS and ADTF
- Closed-loop simulation for function development of ADAS/AD functions
- Function developers retain their preferred toolset and benefit from high-fidelity driving dynamics, GPU sensor models and 3D visualization
- Co-simulation with DYNA4 via flexible DDS communication or
- Export DYNA4 models as ADTF filter

### Range of model improvements
- TMeasy 5 tire model reflects tires’ inflation pressure
- Improved tire test rig and tire fitting when using FTire as reference model
- Support for MF-Tyre 6.2 tire model
- **Open interface to traffic simulators such as SUMO**
- More flexible positioning and routing of traffic
- Power steering configurable for rack assist & variable steering gear ratio
- Steering wheel torque as input in lateral maneuver
- Torque vectoring with multi-disc clutches model
- Smoother controller guidance signals with moving average filter
- Energy analysis for batteries considers more influencing factors

### 3D visualization with DYNAanimation
- Automatic animation scene generation according to the selected scenario and vehicle model
- Variations of vehicle and scenario parameters such as road, weather, traffic, vehicle and sensors directly affect the animation through module-specific animation data
- Many new objects including tunnel, motorcycles, bicycles, vehicles with complete light setup and road infrastructure
- New OpenDRIVE features such as updated road-sign catalog, selection of different road textures and automatic generation of bridges

### DYNA4 Engine
- Engine models with adjustable level of detail to test control units
  - Cylinder pressure and temperature profile in real time
  - Dynamic air mass flow and gas composition with turbo chargers
  - Spark and compression ignition
- Preprocessing workflow for easy parameterization from measurements
- Method for simulation of dynamic NOx concentration and exhaust treatment

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**Co-simulation with ROS via DDS**

**Maneuvers with different tire inflation:**
[Link](www.tesis.de/en/tmeasy/)

**Tunnel and lights**

**Cyclist on bicycle lane**

**Roadworks infrastructure on motorway**

**Crank angle resolved cylinder pressure**
DYNA4 3.0 What’s New?

Improved ease of use
- Enhanced usability with new perspectives
- Improved performance of DYNA4, DYNAanimation and models
- New preconfigured example projects for a quicker start
  - Complex crossing with international roadmarks and traffic
  - Roadworks with narrowing lanes
  - Parallel parking in city environment

Updated platform support
- Matlab up to R2018b
- dSpace up to R2018-A
- NI VeriStand up to 2018 now also with 64bit Matlab
- Vector Canoe up to 11.0
- ETAS LCO up to 5.4.4
- ADTF 2.x

Many more on demand.
Overview: https://www.tesis.de/en/compatibility/

Interested in virtual test driving with DYNA4?
DYNA4 is highly modular and can be tailored to your needs.
Find out more about the features and packages we offer:
https://www.tesis.de/en/dyna4

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