DYNA4: Virtual test driving of cars and commercial vehicles in a virtual environment
DYNA4: Closed-loop simulation of vehicle, environment and sensors in a virtual 3D world

Functions

Virtual Vehicle
> Seamless integration of vehicle control functions and strategies
> One or more vehicles under test (multi-ego set-up), e.g. for cooperative driving
> High-fidelity vehicle dynamics for cars, trailers, trucks and commercial vehicles
> Pre-configured, modular drivetrain models with mechanical and electrical components
> Engine dynamics based on mean-value or detailed thermodynamic cylinder models
> Driver models for different applications

Environment, Sensors and Visualization
> Impressive 3D visualization of your DYNA4 simulations
> Comprehensive and user-extensible object library with signs, vehicles, cyclists, pedestrians, animals, etc.
> Driving on OpenDRIVE road networks without conversion
> Deterministic traffic to create specific scenarios with prescribed behavior, e.g. NCAP
> Stochastic yet reproducible traffic for explorative testing, e.g. driving on highway in dense traffic
> Sensor simulation on decision level with object lists or on perception level with signals from camera, lidar, radar or ultrasonic sensors

Workflows and Connectivity
> Seamless integration of Simulink models, FMUs or C-code
> Integrated test automation and parameter variation
> Standard interfaces e.g. for CANoe, ROS and ADTF
> Integration of standalone DYNA4 runtime simulation projects into other tool environments for execution without MATLAB/Simulink
> Continuous re-use of your tests from MIL, SIL to HIL
> Integrated versioning and teamwork functionality
> Model, data and results management
> Support of all common HIL platforms

Applications

Virtual test driving throughout the entire development process from control function design to verification and validation.

Driver Assistance Systems and Autonomous Driving
> Environment perception: Lane detection, traffic sign recognition, object detection, simultaneous localization and mapping (SLAM) etc.
> Comfort functions: Adaptive cruise control (ACC), traffic jam assistant, parking pilot etc.
> Safety systems: Pre-crash, front collision warning (FCW), automated emergency braking (AEB), lane keeping assistant, blind spot monitoring etc.
> Connected and cooperative driving (Car2x)

Vehicle Dynamics Systems
> Chassis control systems: Electronic stability control (ABS, ASR, ESC), active roll compensation, trailer stabilization, active suspension control etc.
> Steering control: Power steering, rear-wheel steering, superposition steering etc.
> Commercial vehicles with up to two trailers
> Complete vehicle simulation for testing the interdependencies of networked ECUs

System Simulation and Energy Management
> CO₂ reduction: Energy consumption prognosis for vehicles with conventional, hybrid or full electric powertrains and auxiliary units
> Predictive energy management functions
> Development, optimization and testing of hybrid control functions

Combustion Engines
> Engine management functions and on-board diagnosis
> Proof-of-concept studies during early development
> HIL simulators for testing of engine ECUs

More information: www.vector.com/dyna4