Signum MotionAnalysis

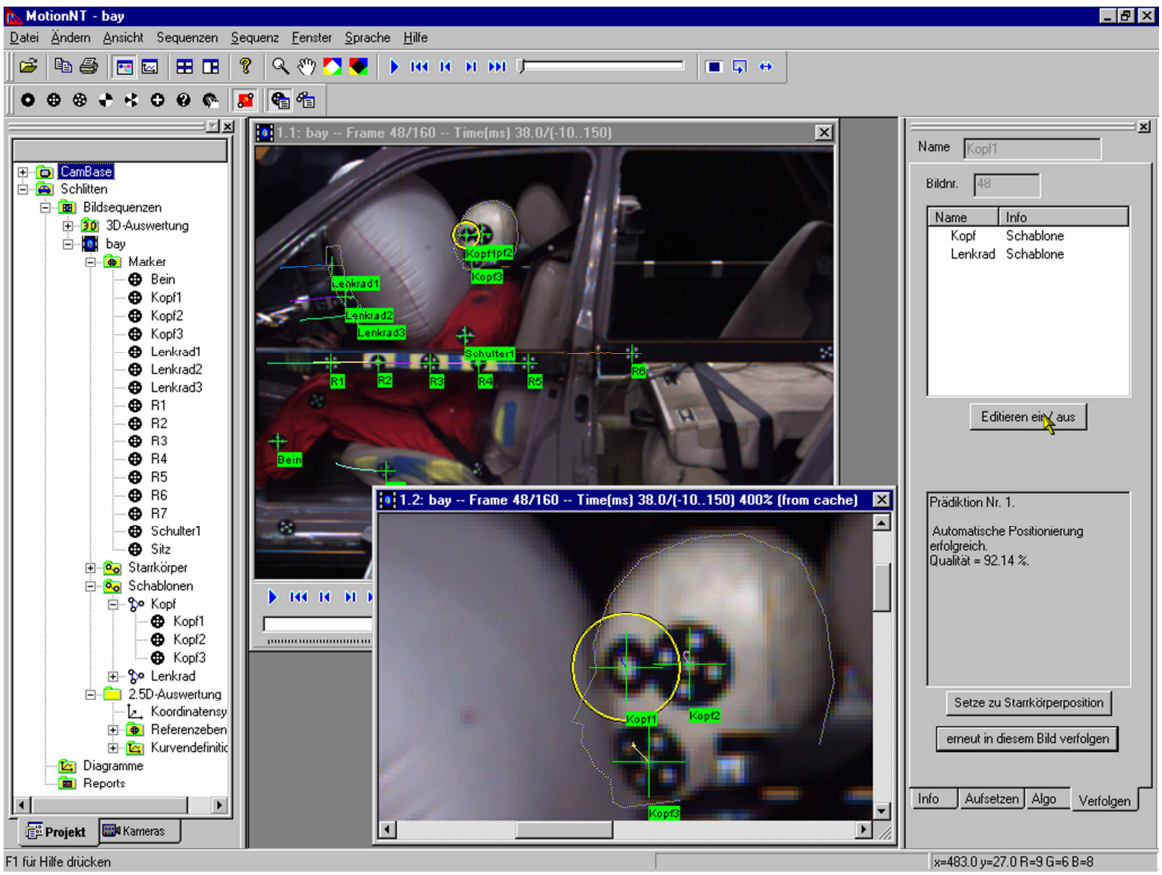
Computer Aided Analysis of fast Movements

In the Automotive world **signum**.MotionAnalysis is the standard for the entire workflow from acquisition to analysis and storage of analyzed data.

signum.MotionAnalysis is a powerful tool for precise video based optical measurement. In addition it is applied for the analysis of high speed cameras. Any number of coded markers as well as free definable pattern is correctly tracked for 2D and 2.5D applications.

signum.MotionAnalysis is fully supporting the ISO-MME data structure to provide standardized handling of analysis.

To further extend of the analyzed data results with measured data from other sensors an import of e. g. Diadem data is fully supported and displayed in diagrams.



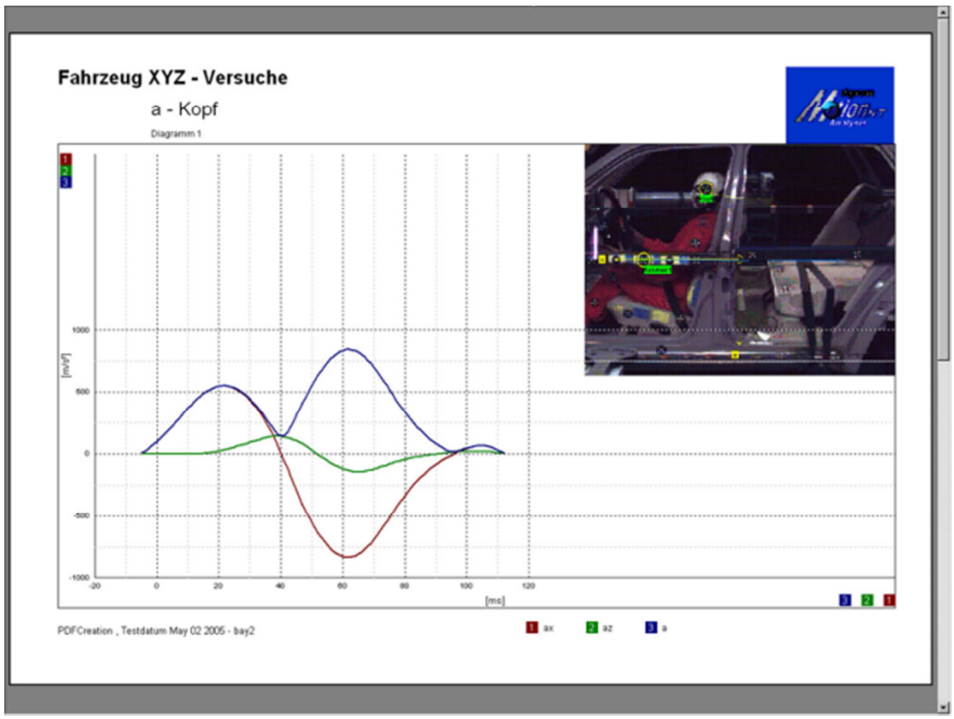
FEATURES

- Includes base system **signum**.Motion Server for convenient viewing of image-sequences
- Intuitive handling with drag-n-drop support and mouse based selection and editing in the viewing window
- Quick and easy definition and set-up of markers with only one mouse-click
- Fast and robust tracking of special markers (1 point, MXT-5 and 6 point) and any other objects (esp. quadrant, 6 segment and cross marker) with subpixel accuracy
- Simultaneous editing of one sequence and tracking of another sequence
- Any number of views per sequence, each with individual size and zoom; focusing on one marker possible
- Clear data structure with MME-project tree

Automation

Option for **signum**.MotionAnalysis Software and all corresponding components

- Creation of a master MME project
- For new tests, all master project data will be used to define and measure motion tracking
- Marker or object names, diagrams etc. will be transferred from master project
- Diagram layouts can be edited according to customer needs (display of logos etc.)
- Complete test results (film overview, diagrams, diagram data, curve data, etc.) will be written to PDF and ASCII files



FUNCTIONS

Definition of a Session

- Load, edit and save projects based on the MME-file format
- Input of
  - Test and session data
  - Film and/or recording features
  - Calibration data
  - Firm-specific report data
- Adding of any movies to one project

Recording

- Support of most video formats
- Monochrome or color scans
- Automatic recording of time information from film, video or high speed system
- Control of and transmission from electronic high speed recording system (option)

Image Processing

- High quality and proven Signum-algorithms for color preprocessing of Bayer and Photosonics movies
- Noise reduction, edge enhancement
- Contrast and intensity correction
- Change of hue and saturation
- White balance and black level functionality
- Gamma and histogram equalization
- Mirroring and rotation of images
- Resize

Tracing of Objects

- Manual
- Semi-automatic
- Full automatic

Handling of Markers

- Easy definition and set-up of markers for "still" (reference) and "moving" objects
- Fast and automatic positioning of special markers (1-point, 5- and 6-point MXT)
- Fast, automatic and orientation tolerant tracking of any rotating object (esp. quadrant, 6 segment and cross markers) with subpixel accurate correlation method
- Grouping of marker for extrapolation of invisible details
- Definition of contours and combination with marker (stencil method)

Correction of Trajectories

- Easy interactive correction of single positions of a curve by drag-n-drop or mouse clicks in editing mode, resp.
- Extremely easy correction of not recognized marker
- Verification of the results by graphic display or numerical listing in data window

Display

- Simultaneous playing of any number of movies
- Any number of views for each movie, zoom can be adjusted by mouse-scroll
- Optional overlay of marker, name or trajectories
- Colored highlighting of markers or their state, resp.
- Export of a movie with overlay

FUNCTIONS

Calibration

- Time calibration: fixed or variable raster
- Still or moving coordinate system
- 3D from single view: object-wise correction of parallaxes
- Camera calibration/ correction of optical distortions with CamBase (option)

Analysis

- Shift with respect to a marker or an image
- Extensive facilities for display of diagrams: choice of several trajectories, different functions (x & y, s / t, v / t, a / t, display simultaneously)
- Output of images and / or diagrams to printer
- Display of statistics (min-max, mean and std. deviation)

Evaluation of Curves

- Free evaluation of time curves
- Arithmetical combination of curves
- Integration and differentiation with tunable filter
- Usage of marker angle or calculation of angles between markers
- Output of results on screen or to printer
- Digital data interface

Archiving of Results

- Storage of image data
- Management of result data and diagrams
- Access to different standard devices:
    - Hard-disk and floppy disk
    - Image archive
    - Transfer via network
    - CDROM / DVD