

New Tools for Terrestrial Laserscanning applied for Monitoring Rails and Buildings

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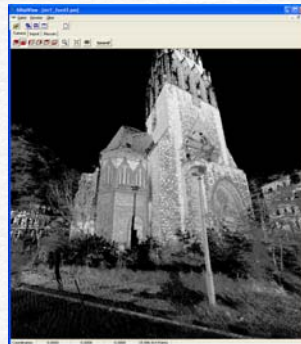
Data Processing Software on the Market

- Software for scanner control
- Software for pointcloud treatment
- Software for fitting of primitives to the pointcloud
- Software for creation of complex surface models (Free form surfaces)
- Software for texture and image mapping
- Software for data and project management

High level integration of tools missing

What do you want to derive from laser scanning?

Point cloud?



- Profiles
- Intersecting planes



Area of the structure gauge
Critical distances

Clearance



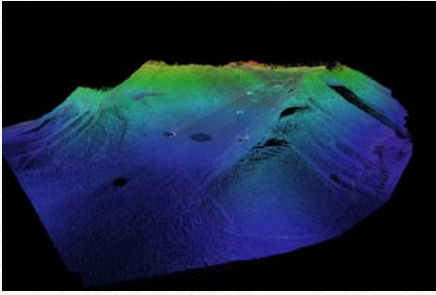
Measuring



Distance to the rail axis

SiRailSystems

Processing – Visualisation



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Processing tools for Laser Scan Data

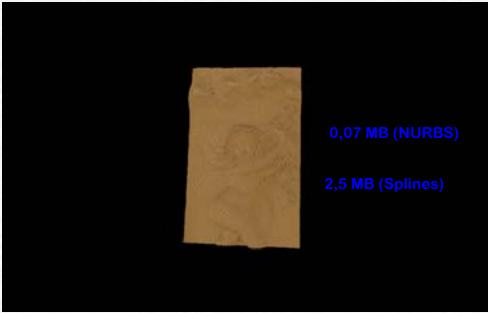
- Processing in the raw point cloud
 - Edge based neighborhood, Polygons
- Processing in the generated surfaces from the point cloud or in the surface objects
 - Surface based neighborhood
 - Mathematical Surface approximation - no meshing

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Data Reduction – Free Forms



0,07 MB (NURBS)

2,5 MB (Splines)

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Concept of the Workflow - SiRailScan

- Registration of single scans
- Selection of areas of interest
- Automated segmentation of the point cloud
- Automated analysis of functional patches (determination of the form functions)
- Merging and data optimization via NURBS
- Detection of significant characteristics

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National Library Berlin – Deformation Monitoring


Epoch 0 *	➔	28.11.2005
•Snow fall		
Epoch 1 **	➔	02.12.2005
** -5° C		
Epoch 2	➔	19.01.2006

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Surfaces of interest – no single targets

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Automated Volume Determination

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Using the Model for Profiles in Raster

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Coal Depot

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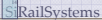

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Settlement and Volumes of a Garbage Dump

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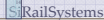

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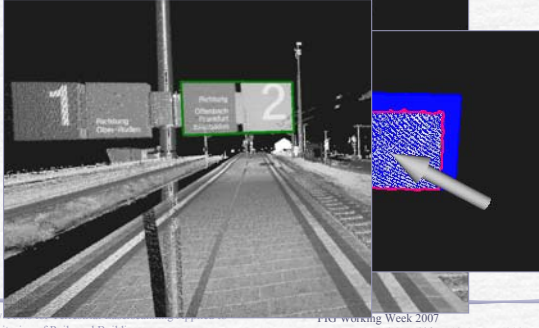
Clearance Between the Obstructions and the Structure Gauge of the Train




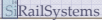

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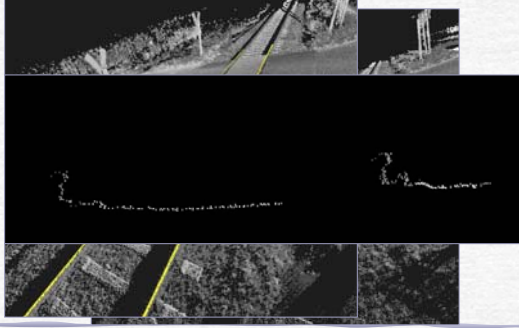
Contour-Finder






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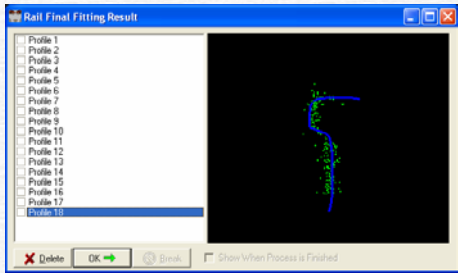
Sections




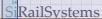

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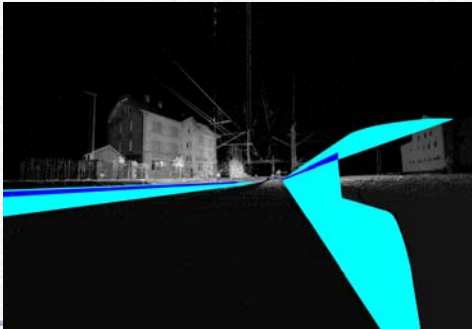
Rail Profile UIC 60




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Fitted Rail

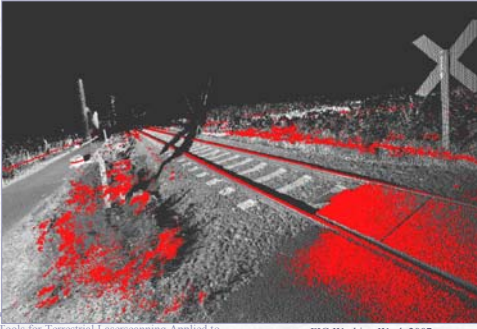


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Points of equal height





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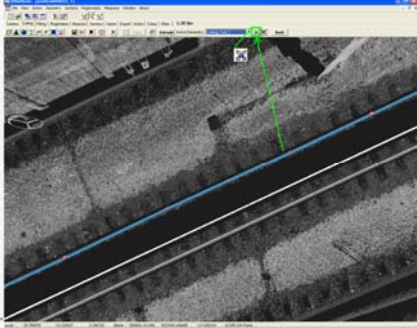
Automated Rail Head Finder





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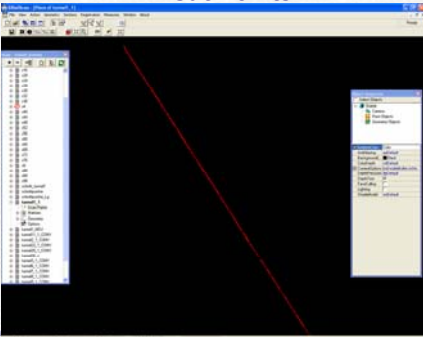
Cutting Tool





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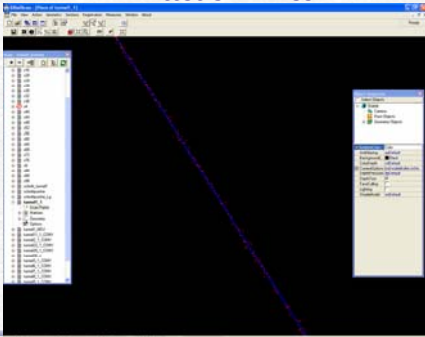
Cut Points





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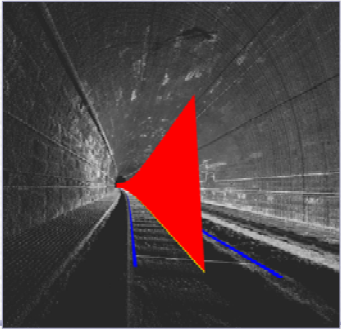
Fitted 3D Lines





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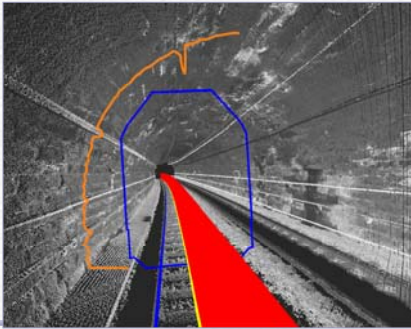
Skeleton Adjustment



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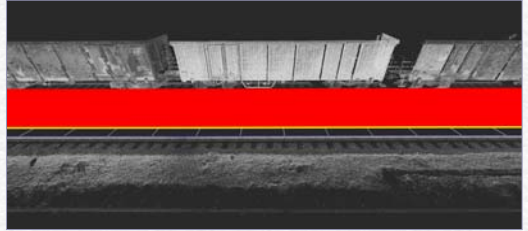



Clearance Measurements



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Result of Vectorisation



Thank you for your attention!

