

Presentation title

Very Advanced 3D Landscape Models

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Recent developments in digital aerial camera technology and automated stereo-processing allow the production of very high resolution digital surface models (dsm) and nearly true ortho aerial image mosaics. The technology for producing digital surface models from cameras such as Ultracam, DMC and ADS was developed by the Institute of Robotics and Mechatronics at the German Aerospace Center (DLR). 3D RealityMaps GmbH has developed a high-performance software to process, display and analyse such huge 3D data sets very efficiently. This software enables users to freely navigate in true photorealistic 3D landscapes in real time and retrieve and display all sorts of geo-information from the Internet.

One promising application is in tourism. In Germany 84% of all travelers plan their vacation beforehand in the Internet. Interactive applications are among the most popular. The internet user get a perfect photorealistic visualization of a holiday destination in 3D at his computer and gets all relevant information for planning the vacation. Just with one click the user is able to book a hotel or finds the perfect hiking trail for the day.

Other applications for very high resolution 3D landscape models include natural disaster prevention (e.g. land slides, avalanches and flooding), climate change analysis (e.g. surveying of glaciers, land cover change), mountain rescue, spatial planning (e.g. infrastructure, tourist facilities) and security applications. In comparison to LIDAR systems up to 200 dsm points per m² can be produced in a single photo flight. LiDAR systems usually produce only 0,2-4 dsm/dgm points per m² in mountainous areas. Another important advantage is the area coverage: using digital cameras up to 2000 km² can be flown per day with a ground resolution of 25 cm compared to 200-300 km² with LiDAR.

Similar advantages are also relevant for 3D city modeling. Digital surface models with 200 and more dsm points per m² allow highly automated and very accurate reconstruction of buildings. 3D city modeling is becoming increasingly important for a wide array of applications including urban visualization, planning and navigation, infrastructure design, defense and homeland security, emergency response, and resource development.