

TERRAIN ANALYSIS

A Digital Terrain Model (DTM) is a digital representation of the shape of the earth's surface from which many other digital products, such as slope, contour, hill shading and aspect mapping can be derived. A DTM, together with derived products, provides the source data for terrain analysis. *Terrain analysis* has a wide range of applications including natural hazard assessment, military manoeuvre control, environmental impact assessment and telecommunications planning.



Product description

Laser-Scan *Terrain analysis* software provides the means for generating derived DTM products. Slope and aspect, hill shading and height difference matrices, isometric and perspective views with vector overlay, intervisibility matrices and vector contours can all be generated from an input DTM and are all vital sources to the terrain analyst.

The software is fully integrated with all other Laser-Scan GIS and mapping applications. Laser-Scan raster files have an integral map projection header, common to Laser-Scan vector files, to facilitate integrated raster and vector display and processing.

The Benefits

- Maximum flexibility is provided through a modular toolset design
- Operation is made easy by fully integrated raster and vector data handling
- Powerful modules reflect Laser-Scan's long held expertise in terrain analysis

Data input

DTM data for terrain analysis can be obtained from a number of sources including the Laser-Scan *DTM generation* option, the Ordnance Survey or commercial data vendors. A comprehensive range of DTM format converters is available for data exchange with other suppliers' systems.

Terrain analysis features

Laser-Scan Limited

Cambridge Science Park,
Milton Road,
Cambridge CB4 4FY

Tel: (0223) 420414

Fax: (0223) 420044

Telex: 817346

Contouring

Vector contours are threaded through a DTM using bi-linear interpolation and optional smoothing of the output strings. The user controls the index and intermediate contour interval, the minimum and maximum values, and also chooses output vector feature codes for contours and spot heights.

Intervisibility

A cover matrix is calculated relating to selected observer or observers or visibility along lines of sight. Surface clutter, earth curvature and atmospheric refraction options are provided.

Slope generation

A slope matrix is generated from a DTM and is expressed in degrees or percent. A choice of algorithms is provided, selectable at run-time. Optionally, output values can be classified into user-defined bands.

Aspect generation

An aspect matrix is generated from a DTM expressed in degrees from the north. Optionally, output values can be classified into user-defined sectors.

Hill shading

A shaded overlay matrix is generated from a DTM expressed using 128 light levels. The module offers user-defined light source (sun) azimuth and elevation, and a choice of three reflectance algorithms.

Height differences

A height difference matrix is generated using specified threshold Z difference, with optional output to editor command files for semi-automatic error evaluation and correction.

Raster/vector conversion

In raster-to-vector conversion, the user can specify data value ranges and optional smoothing of data for vector boundary generation. Output is directly into a link node structured file. Vector-to-raster conversion is at user-specified resolution, with user control over order of conversion of selected point, line and area vectors.

Terrain views

Vector overlay is available on 3D perspective or isometric wireframe views. Output is to screen or vector file.

Flexibility

All terrain analysis modules offer whole file processing or data windowing, with coordinates expressed in lat long, projection units or matrix units.

Requirements

Terrain analysis is an option available with *LAMPS Mapper* or *LAMPS Agency* map production systems, version 3.4 or higher. *Terrain analysis* is an integral component of the *HORIZON Relief* and *HORIZON View* products, version 1.2 or higher.

Laser-Scan *LAMPS* map production systems are designed for the full range of map production tasks including data capture, validation, manipulation and cartographic quality output. The Laser-Scan *HORIZON* Geographic Information System (GIS), designed for environmental applications including terrain analysis and telecommunications planning, integrates vector and raster mapping with a relational database within a state-of-the-art menu interface. Products may be customised to meet the exact needs of different users.