

- Photogrammetric products from Satellite stereo images

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> DEM :

- > Triangular Irregular Network (TIN)
- > Grid (regular spaced)
- > Contours
- > Gray scale image
- > Shaded relief image
- > Perspective view
- > 3-d-view

> Uses of DEM :

- Derivation of contour lines
- Orthophoto generation
- 3D-GIS
- Volume determination
- Generation of slope models
- Urban planning and utility planning

> DEM Precision:

> Accurate profiling during leaf-on conditions

> Automatic DTM point collection:

Image Matching Techniques

- > Area based matching
- > Feature based matching
- > Relation based matching

> Area based matching: The method determines the correspondence b/w two image areas according to the similarity of their gray level values.

The cross correlation. without pain, No Gain

• Automatic DTM point collection:

• Cross Correlation:

$$\rho = \frac{\sum_{i,j} |g_1(C_1 \sigma_1) + g_1 | g_2(C_2 \sigma_2) - R_2|}{\sqrt{\sum_{i,j} (g_1(C_1 \sigma_1) - \bar{g}_1) \sum_{i,j} (g_2(C_2 \sigma_2) - \bar{g}_2)}}$$

$\bar{g}_1 \neq 1/N$

• Least Squares Correlation:

$$g_2(C_2 \sigma_2) = h_0 + h_1 g_1(C_1 \sigma_1)$$

$$C_2 = a_0 + a_1 C_1 + a_2 \sigma_1$$

$$\sigma_2 = b_0 + b_1 C_1 + b_2 \sigma_1$$

• Feature Based Matching:

> Feature based matching determines the correspondence b/w two image features.

> Image Pyramid:

• Ortho-rectification:

• Planimetrically correct orthoimage.

Orthorectification creates planimetrically correct images, which display no relief displacement.

• Advantages and uses of Digital Orthophotos.

• Product which can be readily interpreted like a photograph.

• Mosaics.

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