

Semi-Automatic Technique for 3D Building Model Generation

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Introduction and Problem Definition

- Three Dimensional Building models are excessively used in various applications.
- Automatic DTM generation techniques are not adequate for the built-up areas.
- Manual 3D digitization of the stereo images is time consuming.
- Establishing a semi-automatic technique for the 3D building modeling is required.

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DTM/DSM Generation Techniques

- Existing Maps.
- Ground Survey.
- Radar and Laser.
- Photogrammetry.

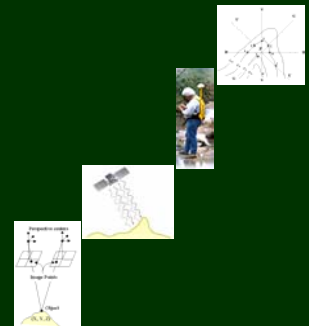


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Photogrammetry

- The most common technique for topographic mapping and DTM generation.
 - The most accurate technique for DSM generation.
- BUT**
- Needs qualified technicians who are able to digitize objects in 3D.
 - Time consuming specially in the built-up areas.
 - Automatic DTM, significantly, reduces the time and effort for generating DTM of large areas.

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Semi-Automatic DSM Generation Chart



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Experimental Work Study Area

I

- Village

II

- City



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Experimental Work

I

- Tie Points Measurements

- Automatic DTM

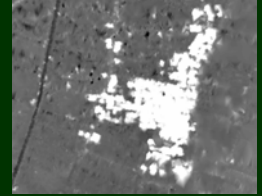
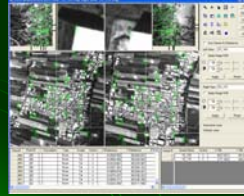


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Experimental Work

I

- Buildings Collection

- True Roof Elevation



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Experimental Work

I

- DTM Extraction

- DSM Generation

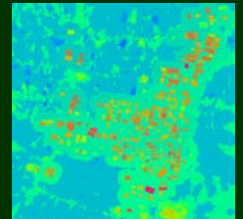
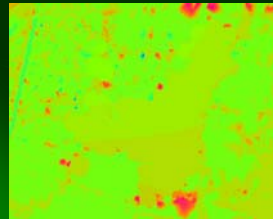


FIG WW 2007 May 14th, HK

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Experimental Work DSM Evaluation

I



II

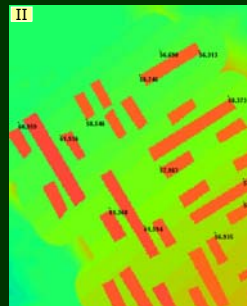


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CONCLUSIONS

- Automatic DTM Extraction modules do not represent urban areas correctly.
- Semi-automatic DEM generation technique can be used for DSM development for better representation of 3D surface models (specially for buildings and sharp-edge objects).
- Introduced Semi-automatic DSM generation technique is accurately represents building representation, around 1.0m in height.

FIG WW 2007 May 14th, HK

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Thank You