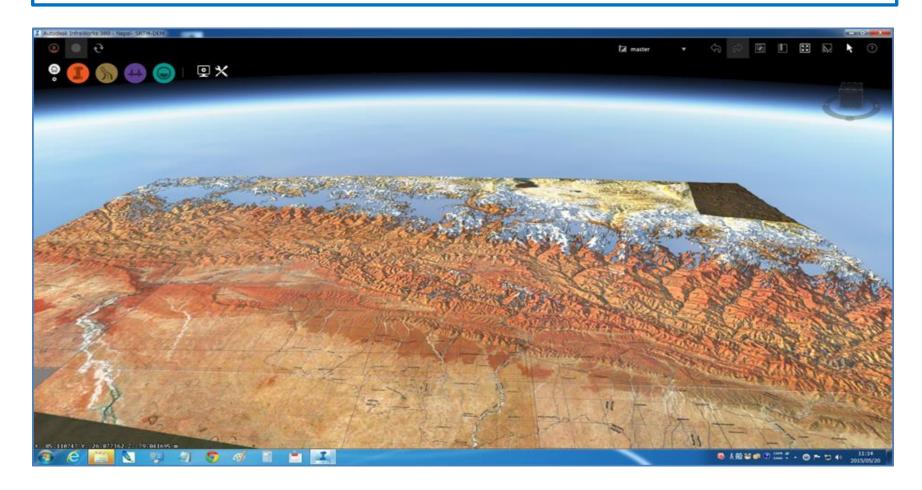
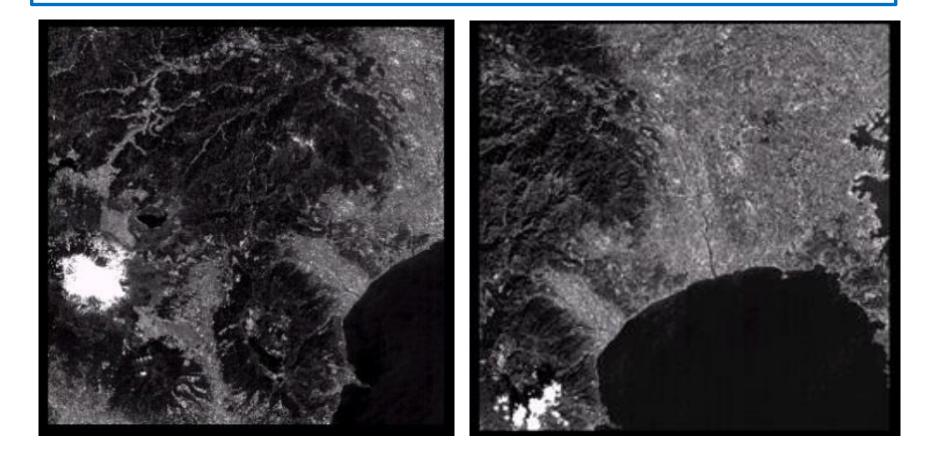
NEPAL EARTHQUAKE 4D-IMADAS 2015 FOR RECONSTRUCTION INITIATIVE FROM REMOTE SENSING TO 3D REMOTE MODELING Hiroyuki Hasegawa

Center for South East Asian Studies (CSEAS) Kyoto University

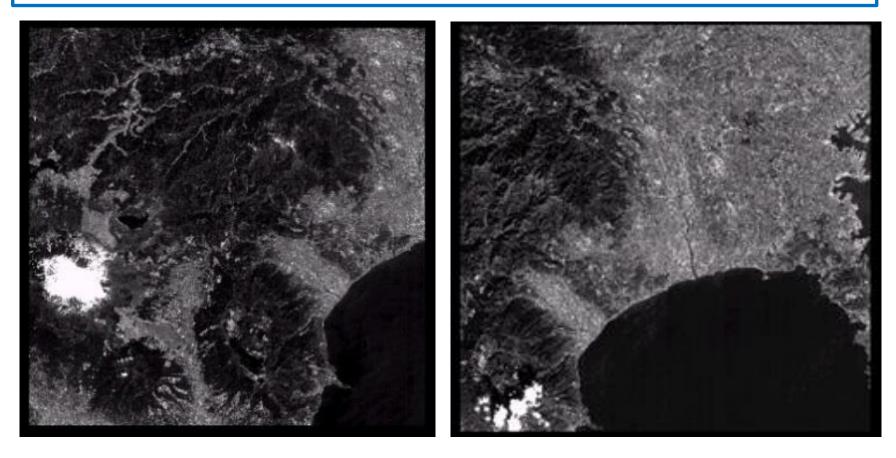


1. NATURAL DISASTER : 4D- IMAGE MAP ARCHIVE DESIGNED AERIAL SURVEY (4D-IMADAS)

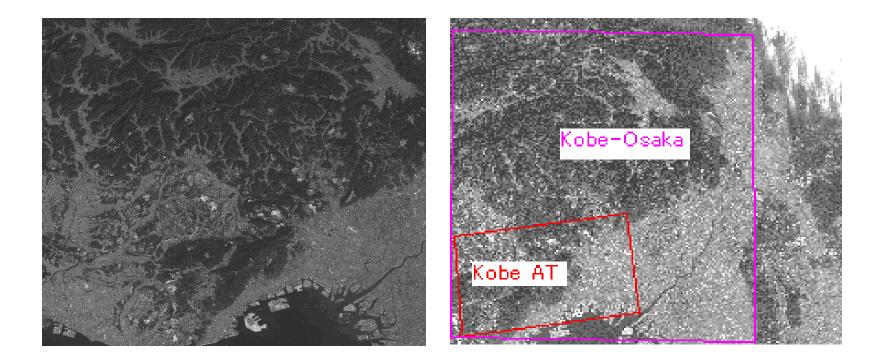
1.1 Aerial Photography and Satellite Imagery at natural disasters



1.1 Aerial Photography and Satellite Imagery at natural disasters
Mt. Fuji; Left ;950404:: Right;961203



2.1 SPOT Stereo Images - Kobe/Osaka/Kyoto area



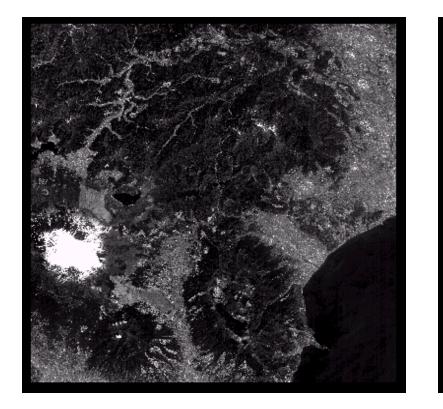
6 Orientation Methods are applied

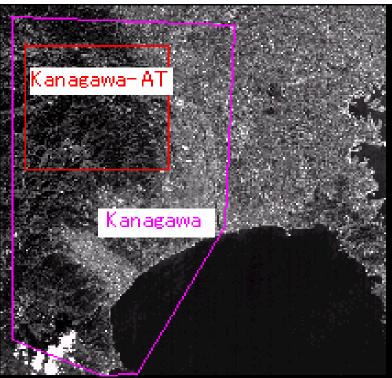
for Satellite Line Sensor Image Stereo Models

B/H ratio = 0.75

2.3 SPOT Stereo Images

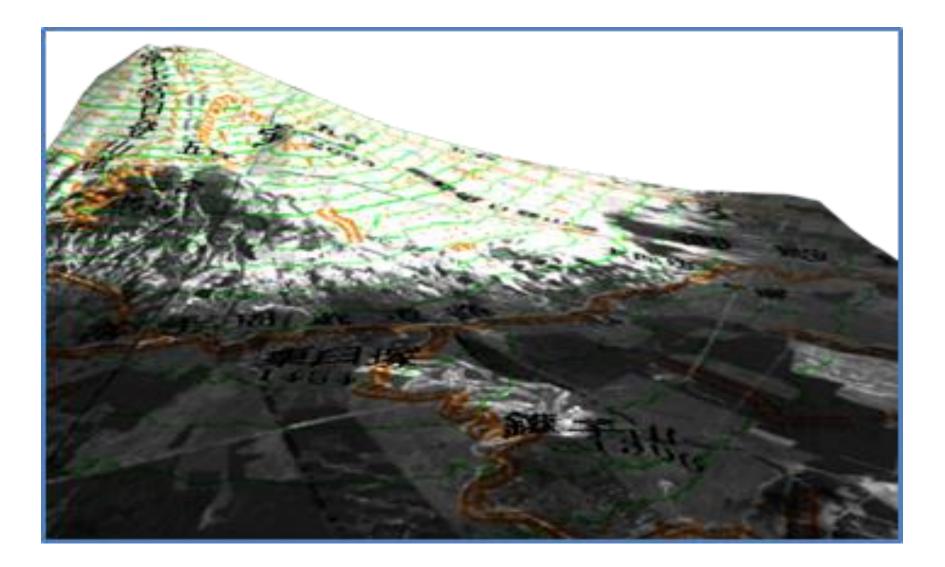
- Mt. Fuji and Kanagawa area



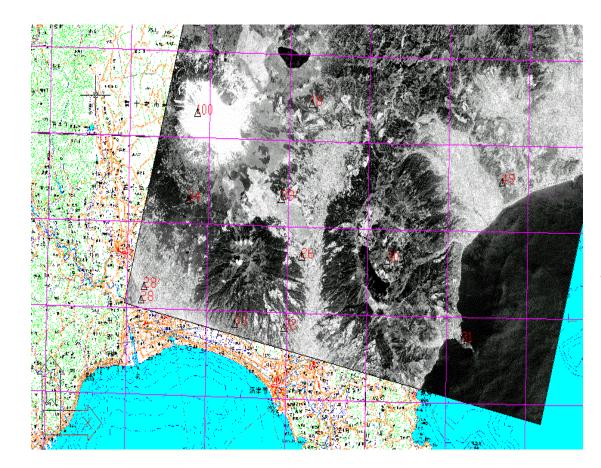


6 Orientation Methods for Mountainous Area (B/H ratio = 0.3)

Mt. Fuji : Map draped 3D diorama (1997)

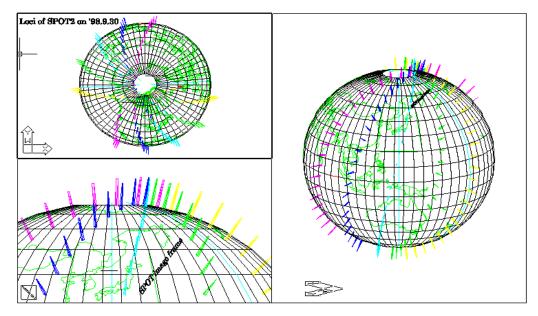


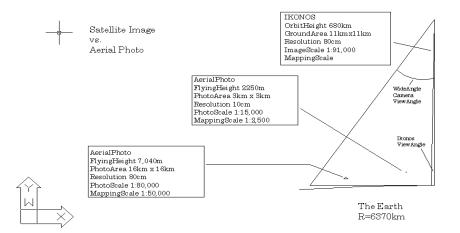
Digital Ortholmages from Satellite Imagery via an Affine Orientation Model



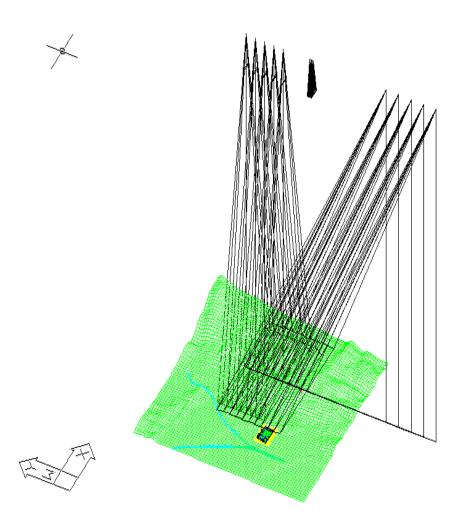
Atsushi Okamoto* Kyoto University Hiroyuki Hasegawa PASCO Corporation **Clive Fraser** University of Melbourne Tetsu Ono Kyoto University Susumu Hattori Fukuyama University

1. Spatial Loci and ground tracks of the SPOT satellite



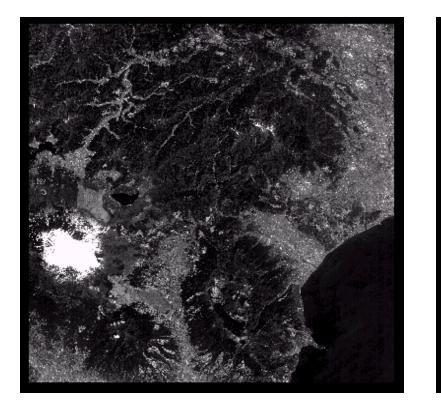


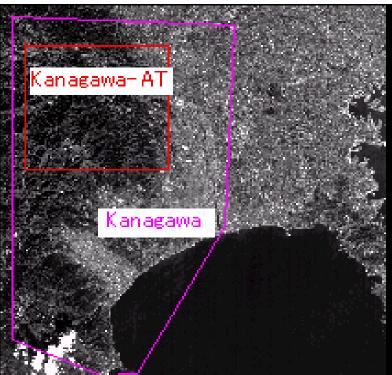
1.2 Stereo Model of Line Sensor Imagery



2.3 SPOT Stereo Images

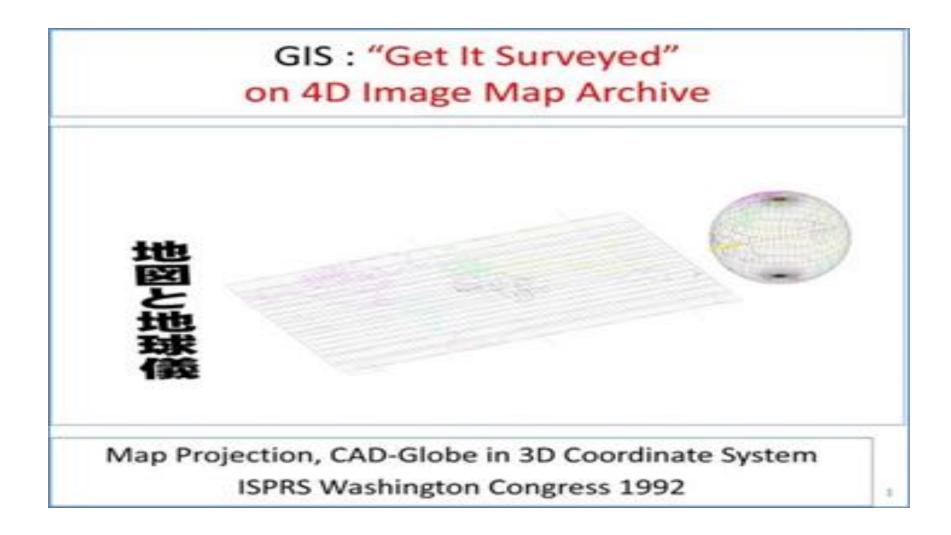
- Mt. Fuji and Kanagawa area



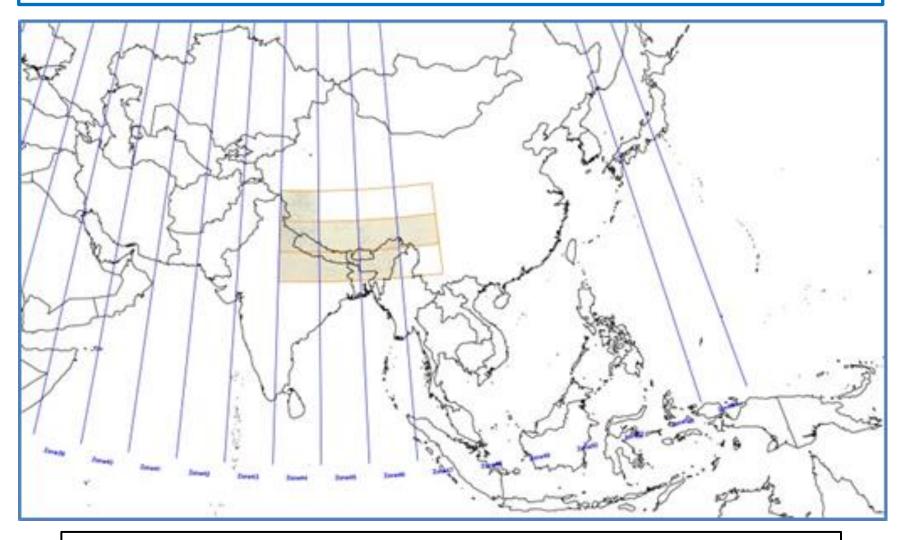


6 Orientation Methods for Mountainous Area (B/H ratio = 0.3)

1.2 3D-CAD map production for reconstruction projects

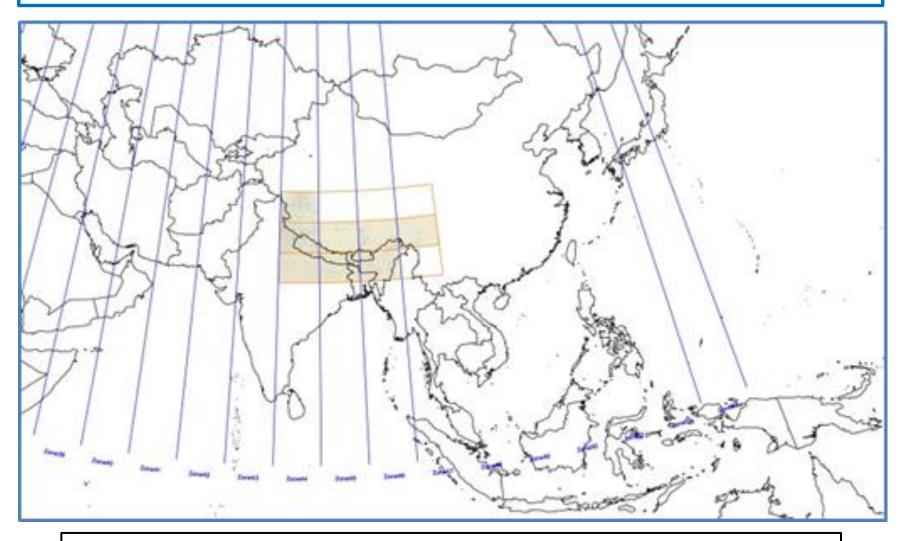


1.2 3D-CAD map production for reconstruction projects Nepal, Bhutan and the Himalayas



India-LCC map projection on WGS84 geodetic datum with 1: 1,000,000 maps

3D-CAD map production for reconstruction projects Nepal , Bhutan and the Himalayas

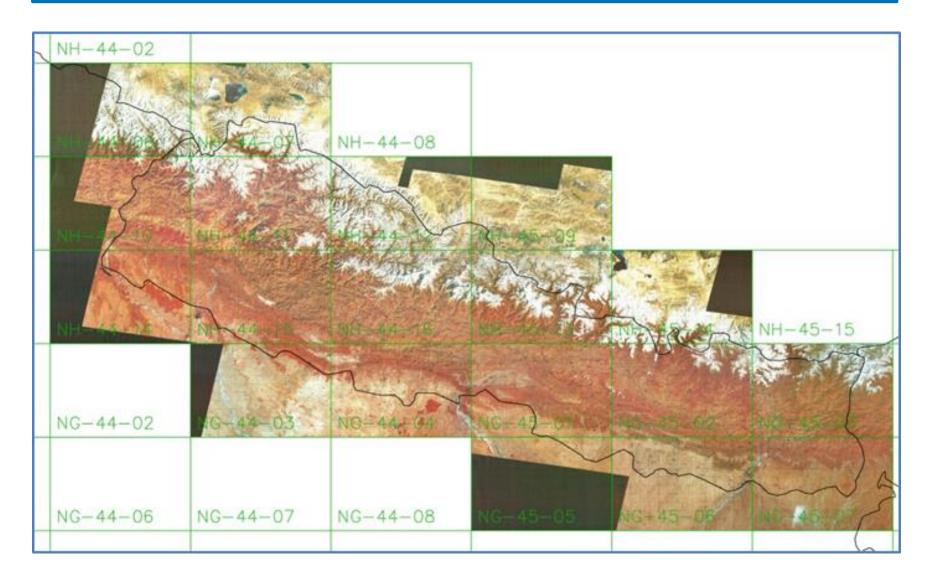


India-LCC map projection on WGS84 geodetic datum with 1: 1,000,000 maps

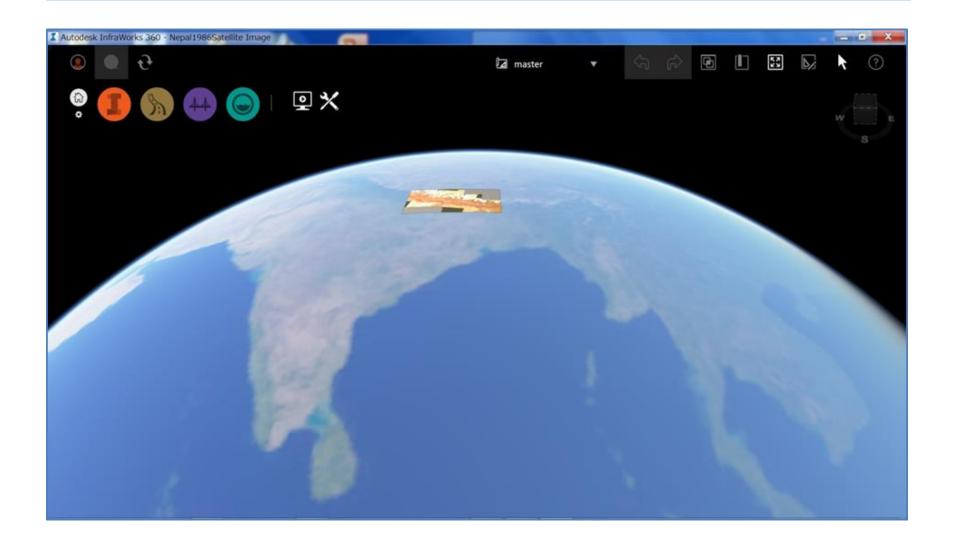
INDIAN-LL map projection on AutoCAD Map3D - Nepal_250K image maps;1955

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WGS84-LL map projection : Nepal-250K satellite image ortho-mosaic map;1986

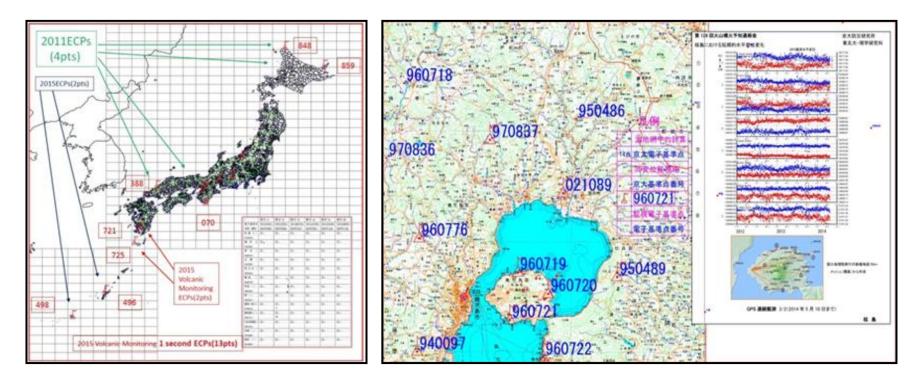


CAD-Globe and 3D diorama by Autodesk InfraWorks360



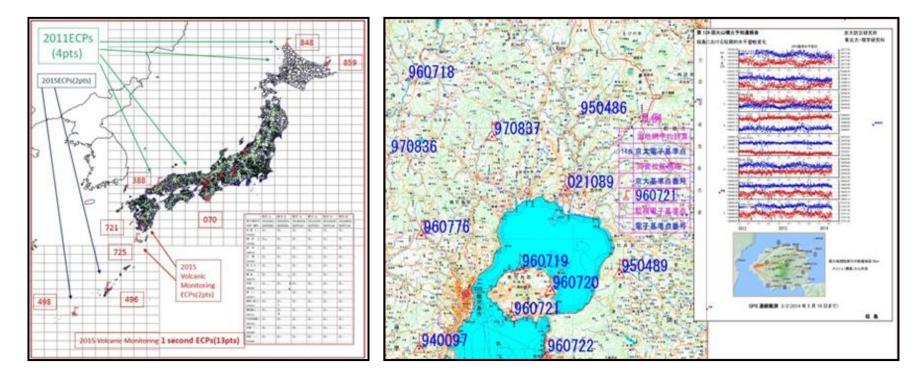
1.3 Ground Control Points by real time GNSS surveying





$1 second - \sigma : 1 cm GNSS network adjustment$ Parameter Estimation Gnss Assisted SUrveying System(PEGASUS)



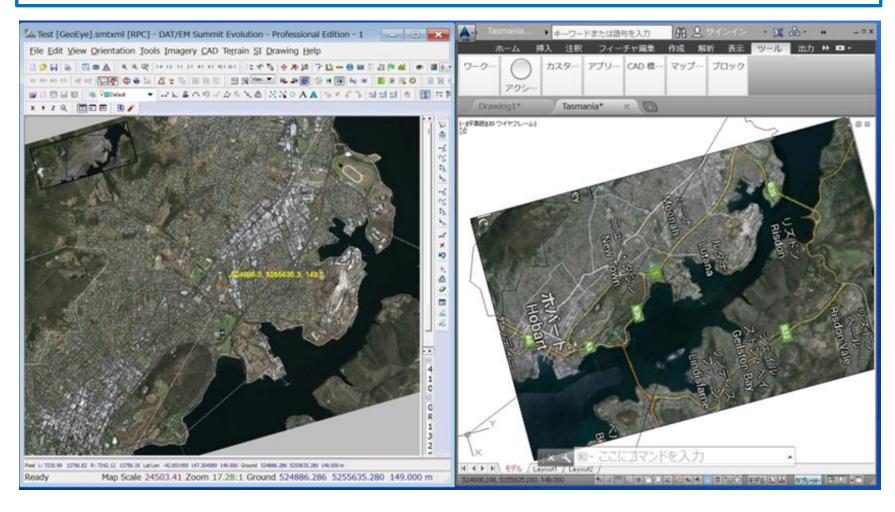


PEGASUS Meister of GNSS and TS surveying



PEGASUS Meister (TS and GNSS – 3D CAD system)

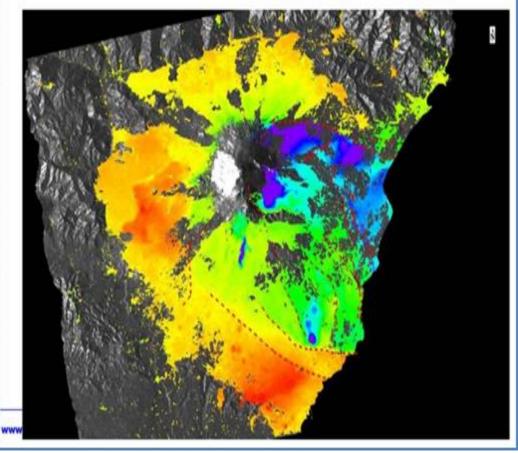
1.4 Satellite stereo 3D modeling and SAR imagery analysis and mensuration GeoEye stereo model on Summit-AutoCAD - Hobart- Tasmania- Australia



ENVI- epipolar images-stereo model and Etna volcano sarmap_2014-33-01



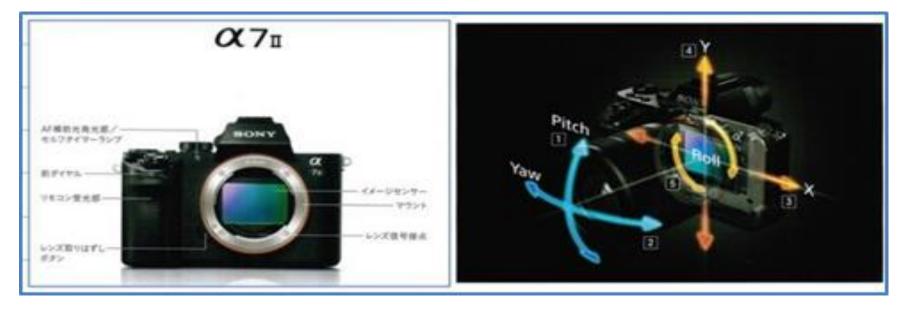
Average displacement rate and active faults



2. 3D-IMAGE MODELING FOR RECONSTRUCTION OF BUILDINGS AND FACILITIES

2.1 New aerial photogrammetry with digital camera and drones and helicopters

CMOS digital camera and anti- vibration devices, Helicopter (2014) and flight plan (2015)





2.2 3D-Image models as 3D land information basis FIG-Cadastre2014, GeoInfoDoc and German Land Information System

Documentation on the Modelling of Geoinformation of Official Surveying and Mapping in Germany ドイツ公共測量・地図作成業務 CADASTRE 2014 地球情報モデル形成仕様書 Benchmarking (GeoInfoDoc) 地籍調查2014 Cadastral Systems 百年の後期間をつための構想 Main Document Josepp Kaudianson / Daniel Strendler 基本文書 PRG 图 7 透信公司1 作用图台之上1.12 first and colited levi Date Count and Distant Webscript Version 5.1 バージョン5.1 ----A CALLER AND A CAL July 31, 2006 ning 7 - Code inc. and it can be and it was in the Party 2006年7月31日 April 20083

German Surveying- and Land Information System and Cadastral Survey

2010

Kummer/Frankenberger (Hrsg.)

Das deutsche Vermessungs- und Geoinformationswesen

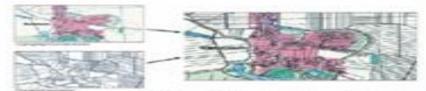
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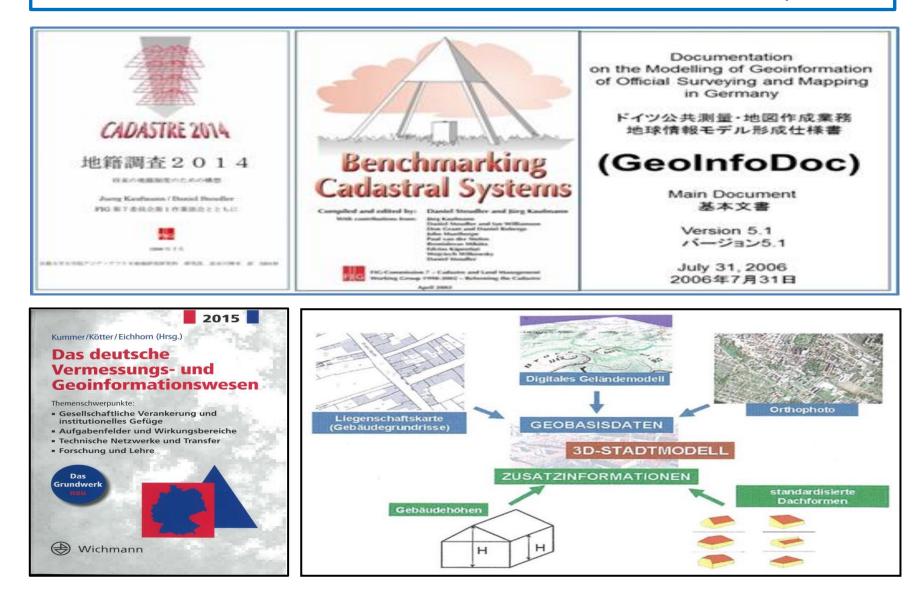
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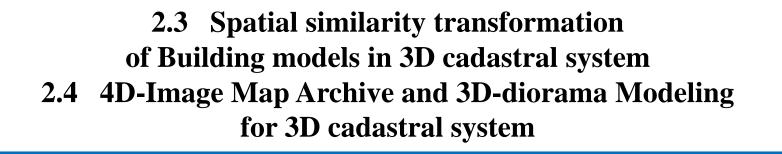
7.8.8 Banks on Officersballow Secondar

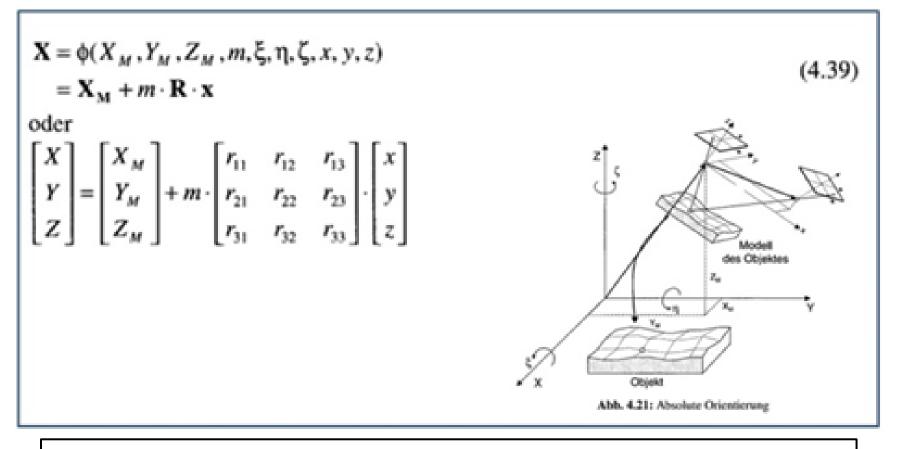
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Reconstruction and National Land Information System

FIG-Cadastre2014, GeoInfoDoc and German Land Information System

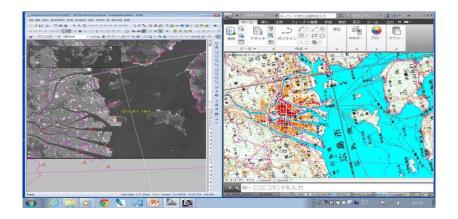






Absolute orientation; concept: T. Luhmann (NahbereichsPhotogrammetrie; 2000)

3. NEPAL - 4D - IMAGE MAP ARCHIVE DESIGNED AERIAL SURVEY



3.1 Old map collections in Japanese Libraries and international Map Libraries

3.2 Unified Map Grid Numbering system for different production periods in Nepal

3.3 Nationwide Assembly of Image Maps for reconstruction projects on 3D-CAD

3.4 Database retrieval and usage on Nepal 4D- Image Map Archive

4. NEPAL 4D- IMAGE MAP ARCHIVE PROJECT

4.1 Configuration of Nepal-Image Map Archive for reconstruction project

4.2 Contribution of the state of the art technology ; evolution of Aerial Survey

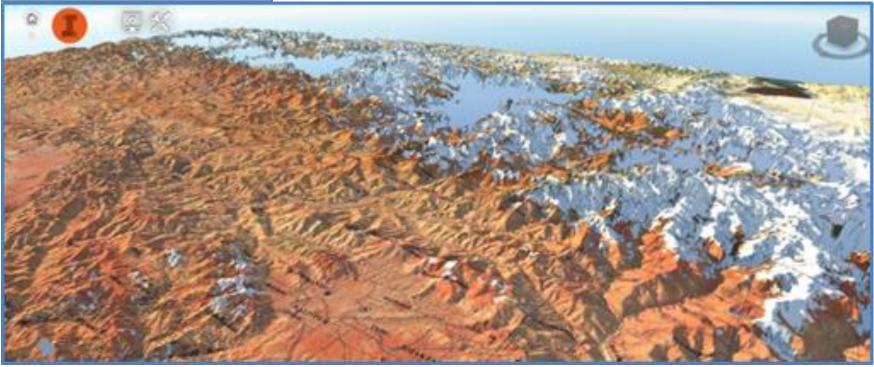
4.3 UN-GGRF initiative and 1cm accuracy real time satellite surveying

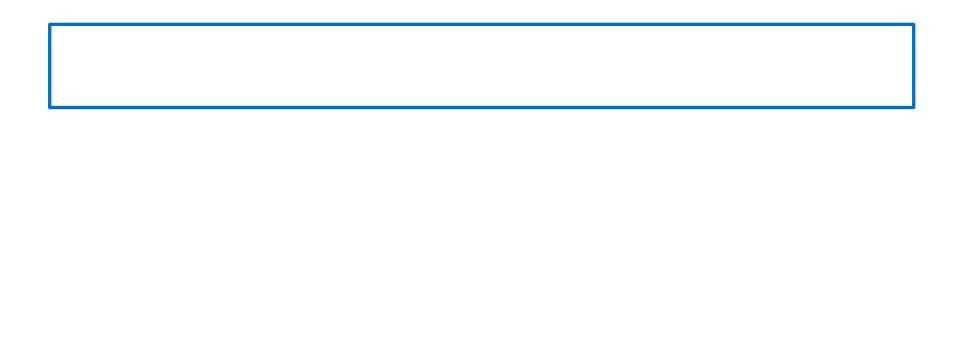
4.4 Earthquake disaster forecasting and world standard Cadastral system



Japan GSI; Global Map of central Nepal

and CSEAS satellite ortho-image 3D-diorama





Cadastre2014 Japan - Initiative for Restoring Original Boundaries by Using Past Aerial Photos

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Cadastre2014 Japan - Initiative for Restoring Original Boundaries by Using Past Aerial Photos

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ACRS 2015; Manila, Philippines, NEPAL EARTHQUAKE 4D-IMADAS 2015 FOR RECONSTRUCTION INITIATIVE FROM REMOTE SENSING TO 3D REMOTE MODELING

Thank you very much for your kind attention !!!

Hiroyuki Hasegawa Center for South East Asian Studies (CSEAS) Kyoto University