Geospatial Modeling & Visualization

A Method Store for Advanced Survey and Modeling Technologies

GMV

Geophysics

GPS

Modeling

Digital Photogrammetry

3D Scanning

Equipment

Data and Projects by Region

Digital Photogrammetry

Key Series on Photogrammetry:



CRP Overview
CRP Documentation

Digital photogrammetry is a well-established technique for acquiring dense 3D geometric information for real-world objects from stereoscopic image overlap and has been shown to have extensive applications in a variety of fields.

Aerial photogrammetry refers to the collection and processing of imagery captured from an aerial or orbital vehicle. Close-Range photogrammetry (CRP) refers to the collection of photography from the ground or some lesser distance than traditional aerial photogrammetry and is becoming increasing popular and accessible due to new, easy to use software and digital cameras. Non-metric, off-the-shelf digital cameras can be used along with relatively inexpensive, or in some cases free, open-source software, to extract and process highly accurate and detailed 3D models of real-world objects.

The Center relies heavily on digital photogrammetry (learn how here) as a

means of collecting 3D data sets and has a number of high resolution digital SLR cameras for collecting close-range data sets. For a description of these cameras and other photogrammetry equipment at CAST, see the Hardware page. The Center also has a number of software packages used for both aerial and close-range photogrammetry. Information about these programs can be found on the Software page.

Learn more starting with the Four Basic Steps of a Close-Range Photogrammetry Project and visit the data page for example photogrammetric data sets created by CAST.

Also see this <u>list of helpful websites and publications</u> for digital photogrammetry and photography.



3D model of Razorback Stadium created from four digital aerial images using PhotoScan Pro (model shown here in Meshlab software)

Click on the image below to activate the interactive guide.

Links to specific examples and articles will become clickable upon zooming.

PHOTOGRAMMETRY

1. Data Collection & Equipment Low Altitude Imagery (UAV, Kite, Pole) Close-Range Photogrammetry Digital Camera/Terrestrial Historic Aerial Photography DSLR Epson Large Octocopter Format Scanner IMAGE CAPTURE SCAN TO DIGITAL IMAGE CAPTURE Camera Setup/ Photo Acquisition Setup : Scanning Images/Media Setup Operation Acquisition Tips: Check List Setup : Scanning Film Check List 2. Data Processing PRE-PROCESS IMAGES in PhotoShop PRE-PROCESS IMAGES in PhotoShop ESTIMATE Camera & Flight Parameters BUILD ALIGN IMAGES ALIGN IMAGES m PhotoScan / PhotoScan Pro PhotoScan Pro MEASURE MEASURE MEASURE Control Points in in LPS Control Points in PhotoScan Pro Control Points in PhotoScan Pro BLOCK ADJUSTMENT in LPS Alternative Route: Basic Processing in PhotoScan Pro Alternative Route: Basic Processing in LPS **Data Set** Data Set in in LPS **PhotoScan** 3. Extracting, Building and Exporting 3D Surfaces & Features BUILD 3D GEOMETRY BREAKLINES Mesh in PhotoScan Pro EXTRACT 3D SURFACE MODEL BUILD TEXTURE N - Triangulated Irregular Netwoo DEM - Digital Elevation Model in LPS PhotoScan / PhotoScan Pro EXTRACT 3D FEATURES EXPORT ORTHOIMAGE or **DEM** (Digital Elevation Model) CREATE ORTHOIMAGE **Looking at the Data** Viewing and Basic Measurements Data Export iscussion and Comparison of Export Formats in LPS Data Set Comparison Comparing 3D models in RapidForm Comparisons may be performed in a variety of other software including: Proprietary Software Free Viewers ArcGIS MeshLab - for meshes

in PhotoScan / PhotoScan Pro in PhotoModeler

CloudCompare, ArcGIS & MeshLab

ArcGIS Explorer - for DEM's,