

Photogrammetric Processing: Surface Model and Orthophotograph

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INTERMEDIATE WORKSHOP

This workshop is designed to walk the participants through a complete photogrammetric cycle while identifying issues, concerns, and successes in projects. This workshop is built around each of the major fundamental cycles of photogrammetry.

Image Collection- We will begin with the simple review of stereo imagery. Creating optimal stereo is easy once the three major stereo angles (Convergence Angle, Asymmetry Angle, and Bisector Elevation Angle) are acquired within a specified tolerance. We will show and describe each of the three stereo angles. We also discuss the effect of going outside the angle tolerance does to the parallax and accuracy of the end product.

Triangulation- Next we will review the importance of an accurate and successful triangulation report and how that applies to both surface modelling and the final Orthophoto. We will identify what makes a good ground control point and tie point and how to apply it in a photogrammetric bundle.

DEM Generation - Once the stereo mates and an ample triangulation solution have been identified, an accurate Digital Elevation Model, Digital Terrain Model, Digital Surface Model, feature extractions, and 3D models can be created. We will discuss post spacing, contour intervals, and terrain enhancing techniques to aid in the rectification of the imagery. The end user will leave the workshop knowing the differences between Digital Elevation Models, Digital Terrain Models, and Digital Surface Models. We will talk about the pros and cons of each and how they apply to creating a successful and accurate orthophoto.

Orthophotography- We will address the process of correcting imagery for distortion using elevation data and a camera model information so that the scale variation corresponds to a map projection throughout the image. Mosaic cutlines and cloud patching technics will be shared.

Ortho Accuracy Assessment - We will sources of error such as control point errors, terrain displacement, and troubleshooting techniques if areas need to be corrected. We will discuss reporting a products accuracy including differences between RMSE vs. CE90, and RMSExy vs. RMSEr. We will talk about variation in sample size and how it will affect your accuracy reporting.

Each photogrammetric process will be described at a beginning to an intermediate level. The audience member should have some familiarity with the photogrammetric process. Many examples will be given to help emphasize and help visualize the photogrammetric process. Workshop examples are based on actual projects results. The audience will be encouraged to share their successes and lessons learned in their own Surface Modeling and Orthophoto experience.