Watershed Sciences 4930 & 6920
GEOGRAPHIC INFORMATION SYSTEMS

BLIMP LAB

GEOREFERENCING BLIMP IMAGERY

Joe Wheaton
 TASK 1 - SOME COMMON PROBLEMS

Georeference a blimp image with full coverage of quad to 2006 HRO

• Finding a photo with full coverage of quad

• Downloading the wrong size image from Picasa and getting a coarser resolution then 2006 HRO

• Not enough context text! Err on side of verbosity…

• Distortion…. Why does it occur and how can you improve it?
TASK 1 - Example 1 of 3

Georeferenced Images of the USU Quad

Location of Quad in Logan, UT

Blimp Image 2009

2006 HRO Image

Photo from State of Utah GIS Portal
http://agrc.ut.state.ut.us/
accessed on 24-Sep-09
resolution is 1 m

Photo from USU GIS Course
“Thurs Group 9”
aquired with small blimp
resolution is 31 cm
residuals errors between control points vary from 0.2-3.5

Photo from State of Utah GIS Portal
http://agrc.ut.state.ut.us/
accessed on 24-Sep-09
resolution is 25 cm
Georeferencing a Blimp Photo of the USU quad using the 2006 HRO Imagery

a) the Georeferenced Blimp Photo

b) the 2006 High Resolution (1-foot) Orthorectified Aerial Imagery

Spatial Reference: Datum: NAD 1983
Projection: UTM; Zone: 12N (in meters)
Image Source: Blimp: Acquired by USU students of WATS 4930/6920 Thursday lab. group
2006 HRO: Utah GIS portal (http://gis.utah.gov/aerial)
Estimated Error of Blimp rectification: Total RMSE of 0.16295 with 20 points
Transformation: 3rd order polynomial
Acquisition Methods: Blimp Photo and Utah GIS portal (HRO)
Estimated Error: 60358 meters
Resolution: Blimp: .076 meters HRO: .25
TASK 2 – SOME COMMON PROBLEMS

Georeference same blimp image from Task 1 using total station control collected from garbage bags

• Choosing an image that although it had full coverage of quad was too oblique
• Didn’t report rectification errors (clearly enough or at all)
• No comment on qualitative goodness of fit
• No grid shown… Not recognizing assumed coordinate system
• No explanation to Facilities…
TASK 2

Questions:
• Is this done correctly?
• Why is background black?
• Does it need a grid to be correct?
TASK 2

Utah State University

Georeferenced Image
Aerial image taken from Blimp 9/15/2009
Projection: NAD 1983 UTM Zone 12N
Information received via total station survey
7.5 cm Resolution
RMS error: 1 cm

Lab 3, task 2
October 1, 2009

Utah State University
TASK 3 - SOME COMMON PROBLEMS

Georeference 2 to 6 higher resolution blimp images using total station control, which collectively cover quad

- Finding the ‘right’ images
- ‘I georeferenced each image correctly but they don’t line up’ – GEOMETRY!!!!
  - What could I do to fix that?
- Confusion over mosaicing…
TASK 3

• How could error be estimated and reported?
TASK 3 - PART II

Logan, UT: Quad

Task 3 Image
Georeferenced 2 photos using the control points found using total station and control points marked on the ground by garbage bags with numbers on them. Resolution of 2 photos 8 cm.

Task 2 Image
Georeferenced using 12 total stations for control on points marked on the ground by garbage bags with numbers on them. Applied a 2nd order transformation which gave a total RMS error of 0.26277. Resolution 8.2 cm.

Inset: HRO Image 2006
NAD 1983 UTM, Zone 12 N (meters)
Transverse Mercator
Resolution 25 cm
Utah GIS Portal (http://gis.utah.gov/sgrid)

Legend
- quad
- usucampus

Projections are UTM Zone 12N, Datum is NAD 1963 (meters)

Blimp photos taken on 9/15/2009 using a blimp flown over the quad for class WATS 4930. Tues group 7-8 Camera used was RICOH model CX1, took a picture every 3 seconds.
This student chose to show the steps leading up to construction of mosaic.
MOSAIC (BY OVERLAY OR COMMAND)

- Yours’ isn’t as easy as the textbook help example