

ISIS - Bug #476

Camera class does not compute pixel resolution accurately for limb images

2011-09-27 08:40 AM - Jeff Anderson

Status: Closed	
Priority: Normal	
Assignee: Tyler Wilson	
Category: API	
Target version: 3.4.13 (FY16 R3 2016-08-31 Aug)	
Impact: Pixel resolution will be more accurate for limb images. This will impact upon any application that uses the Camera class.	Software Version:
Description	
<p>The pixel resolution in the camera class does not compute an accurate pixel resolution other than at the sub-spacecraft lat/lon. The routine uses the proportion of</p> $\text{detectorSize} / \text{focalLength} = \text{groundPixelResolution} / \text{spacecraftAltitude}$ <p>so</p> $\text{groundPixelResolution} = \text{spacecraftAltitude} * \text{detectorSize} / \text{focalLength}$ <p>This does a poor job of approximating the pixel resolution at limbs or in the far range of wide angle cameras. A better approximation would be</p> $\text{groundPixelResolution} = \text{spacecraftAltitude} * \text{detectorSize} / \text{focalLength}$ $\text{groundPixelResolution} = \text{groundPixelResolution} / \cos(\text{emissionAngle})$ <p>Of course this is not 100% accurate but is significantly better and is not too slow of an algorithm.</p> <p>Obviously we have to decide how to deal with $\cos(\text{emissionAngle})$ approaching zero. The other concern is how this will impact the iterative loops which converge on pixel resolution. Expect to see the truth data for many application and unit test to change slightly.</p>	
Related issues:	
Copied to ISIS - Feature #4100: A different formula for calculating the detec...	Acknowledged

History

#1 - 2012-03-01 12:22 PM - Stuart Sides

Type from major to bug. Priority unchanged.

#3 - 2013-08-15 10:41 AM - Anonymous

- Target version deleted (150)

#9 - 2015-08-11 08:47 PM - Kristin Berry

- Impact updated

#10 - 2015-08-12 11:39 PM - Kristin Berry

- Target version set to 3.4.11 (FY16 R1 2015-10-28 Oct)

#11 - 2015-09-17 02:21 PM - Kristin Berry

- Assignee set to Tyler Wilson

#12 - 2015-09-17 02:29 PM - Tyler Wilson

- Status changed from Acknowledged to In Progress

#13 - 2015-09-18 02:49 PM - Tyler Wilson

- Impact updated

#15 - 2015-10-23 05:25 PM - Tyler Wilson

- Status changed from In Progress to Resolved

#16 - 2016-06-10 06:10 PM - Tammy Becker

Test data:

/work/users/tbecker/IsisTesting/M00476_ObliqueResolution/

I've tested camstats, phocube and mosrange.

camstats returns ObliqueSampleResolutionMinimum=-1.0 (Line and ObliqueResolutionMinimum also)

for three of the test images:

N1487299578_1_callptr.cub

N1487299918_2_callptr.cub

W1637463028_1_callptr.cub

mosrange:

Only include the Min and Max ObliquePixelResolution.

Remove the ObliquePixelResolution and ObliqueScaleResolution

Will test campt next.

A separate ticket will be created to add this information to additional applications, such as the qview AdvancedTrackTool, caminfo and cnettable

#17 - 2016-06-28 02:27 PM - Tyler Wilson

- Status changed from Resolved to In Progress

#18 - 2016-06-28 04:12 PM - Tyler Wilson

- Camera::ObliqueDetectorResolution() now returns Isis::Null if (a) There is no surface intersection and (b) The emission angle is greater than $\pi/2$ (ie an angle above the limb of the target). This also makes the results consistent with this issue: <https://isis.astrokeology.usgs.gov/fixit/issues/2065> which is currently in progress.
- ObliquePixelResolution and ObliqueScaleResolution were removed from the output for mosrange.

#19 - 2016-06-28 04:28 PM - Tyler Wilson

- Copied to Feature #4100: A different formula for calculating the detector resolution for the Camera class has been added, and it needs to be integrated into the following applications. added

#20 - 2016-06-28 04:38 PM - Tyler Wilson

- Status changed from In Progress to Resolved

#21 - 2016-07-22 06:17 PM - Tammy Becker

Hi! Ready to test...not sure what to setisis to??

I tried setisis /work/projects/isis/latest/m00476/

/work/projects/isis/latest/m00476/isis/bin/isiscomplete: error while loading shared libraries: libpng16.so.16: cannot open shared object file: No such file or directory

And, I don't see a /work/projects/isis/latest/m04100?

I also still want to check out the glossary for this new term (oblique resolution)!

Thanks

#22 - 2016-07-24 02:46 PM - Tyler Wilson

Oh sorry Tammy! I recompiled it to my version of Linux and not Scientific Linux to make the last set of changes you asked for. I'll compile it for the version you use on the cluster. Please look in the directory:

/work/projects/isis/latest/m00476_4100/

#23 - 2016-08-07 01:02 PM - Tammy Becker

The following applications have been tested and evaluated with the new oblique resolution values:

campt
camstats
mosrange
photomet

I also reviewed the new glossary definitions, as well as the new figures...

#24 - 2016-08-07 01:03 PM - Tammy Becker

- Status changed from Resolved to Closed

- Target version changed from 3.4.11 (FY16 R1 2015-10-28 Oct) to 3.4.13 (FY16 R3 2016-08-31 Aug)