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RadPro

Radiography Processing Tool

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Nevada National Security Site

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Outline

- Objectives
- Operations & Order
- Interface & Usage
- File Nomenclature
- Enhancements
- Future & Summary



Objectives (Original)

- Process Cygnus Radiographs
- Simplicity in processing data
- Simplicity in modifying options/parameters
- Read and display images
- Perform basic processing methods:
 - De-Star, Subtract, Normalize, Rotate, Tile Boundaries, De-Warp
- Batch Process a list of shots



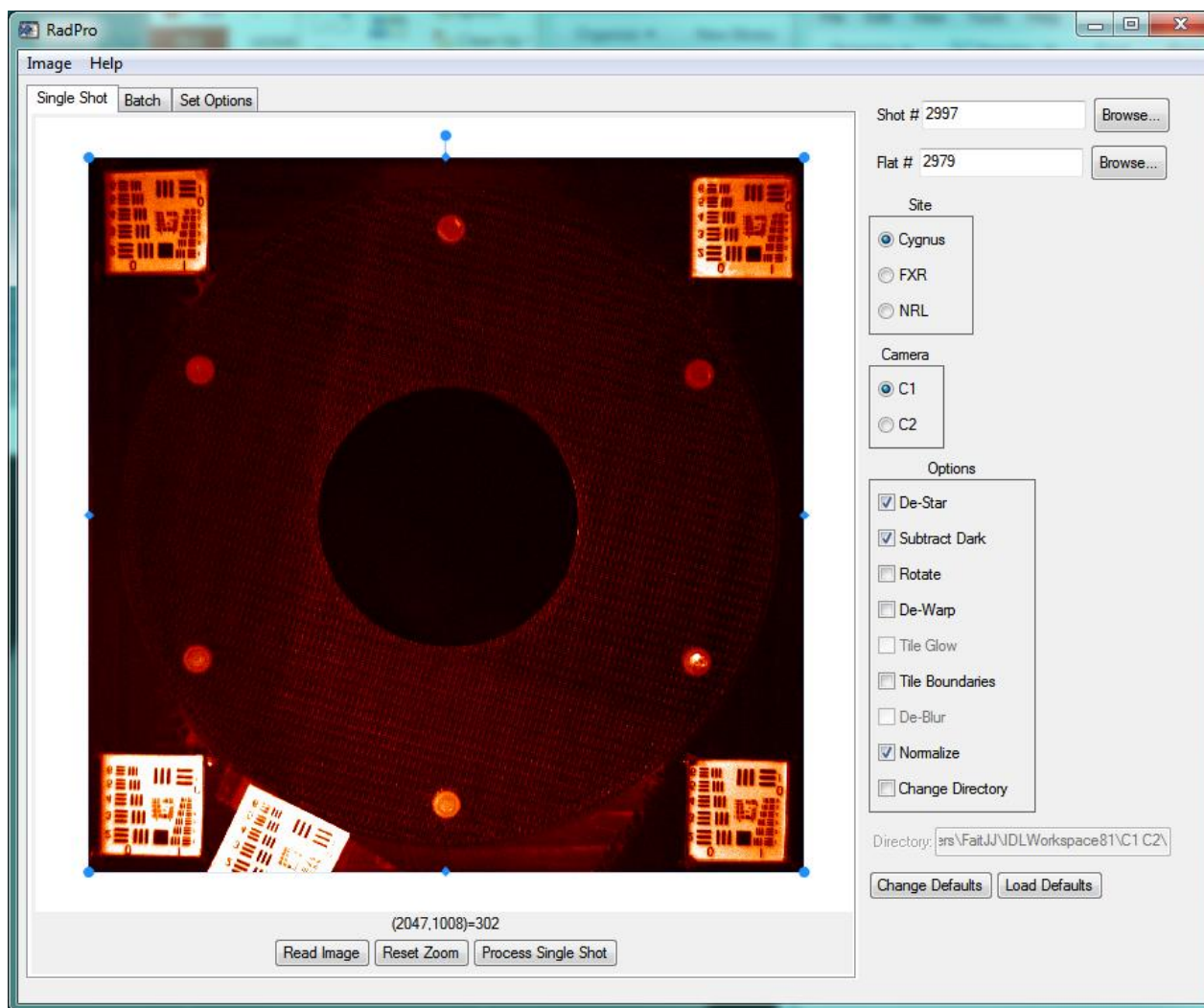
Operations & Order

$$\frac{\text{Dose}_{\text{FF}}}{\text{Dose}_{\text{Img}}} \left(\mathcal{I} \left(\mathcal{W} \left(\mathcal{R} \left(\frac{\mathcal{D}^*(\text{Img}) - \mathcal{D}^*(\text{DF}_{\text{Img}})}{\mathcal{D}^*(\text{FF}) - \mathcal{D}^*(\text{DF}_{\text{FF}})} \right) \right) \right) \right)$$

- Tile glow correction – disabled
 - After *Rotation* operation
- De-Blur – disabled
 - After Tile Boundary correction operation



Interface – Single Shot



Interface – Set Options

RadPro

Image Help

Single Shot Batch Set Options

De-Star:

Box Width: 11 Max Star Size: 45

Rotate:

Degrees(cclock,transpose+rot=360-720): 90.0000

De-Warp:

Old/New Locations File: ers\FaitJJ\DLWorkspace81\Dewarp Test\Dewarp TestPoints.bdt

Tile Glow:

Mask Image: DLWorkspace81\Dewarp Test\C1Shot2989TileBoundaryMask.tif Glow Factor: 1.00000

Tile Boundaries:

Mask Image: Users\FaitJJ\DLWorkspace81\C2\C1Shot2989TileBoundaryMask.tif

De-Blur:

LSF File: Not in use

Normalize:

Shot Dose (0=Read From PIN): 0.000000 Flat Dose (0=Read From PIN): 0.000000

Read Options File

Shot # 2997 Browse...

Flat # 2979 Browse...

Site

☐ Cygnus

☒ FXR

☐ NRL

Camera

☒ C1

☐ C2

Options

☒ De-Star

☒ Subtract Dark

☐ Rotate

☐ De-Warp

☐ Tile Glow

☐ Tile Boundaries

☐ De-Blur

☒ Normalize

☐ Change Directory

Directory: ers\FaitJJ\DLWorkspace81\C1 C2\

Change Defaults Load Defaults

Interface - Batch

RadPro

Image Help

Single Shot Batch Set Options

	Shot Number	Flat Number	Shot Dose	Flat Dose	C(1-2)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Shot # 2997 Browse...

Flat # 2979 Browse...

Site

☐ Cygnus

☒ FXR

☐ NRL

Camera

☒ C1

☐ C2

Options

☒ De-Star

☒ Subtract Dark

☐ Rotate

☐ De-Warp

☐ Tile Glow

☐ Tile Boundaries

☐ De-Blur

☒ Normalize

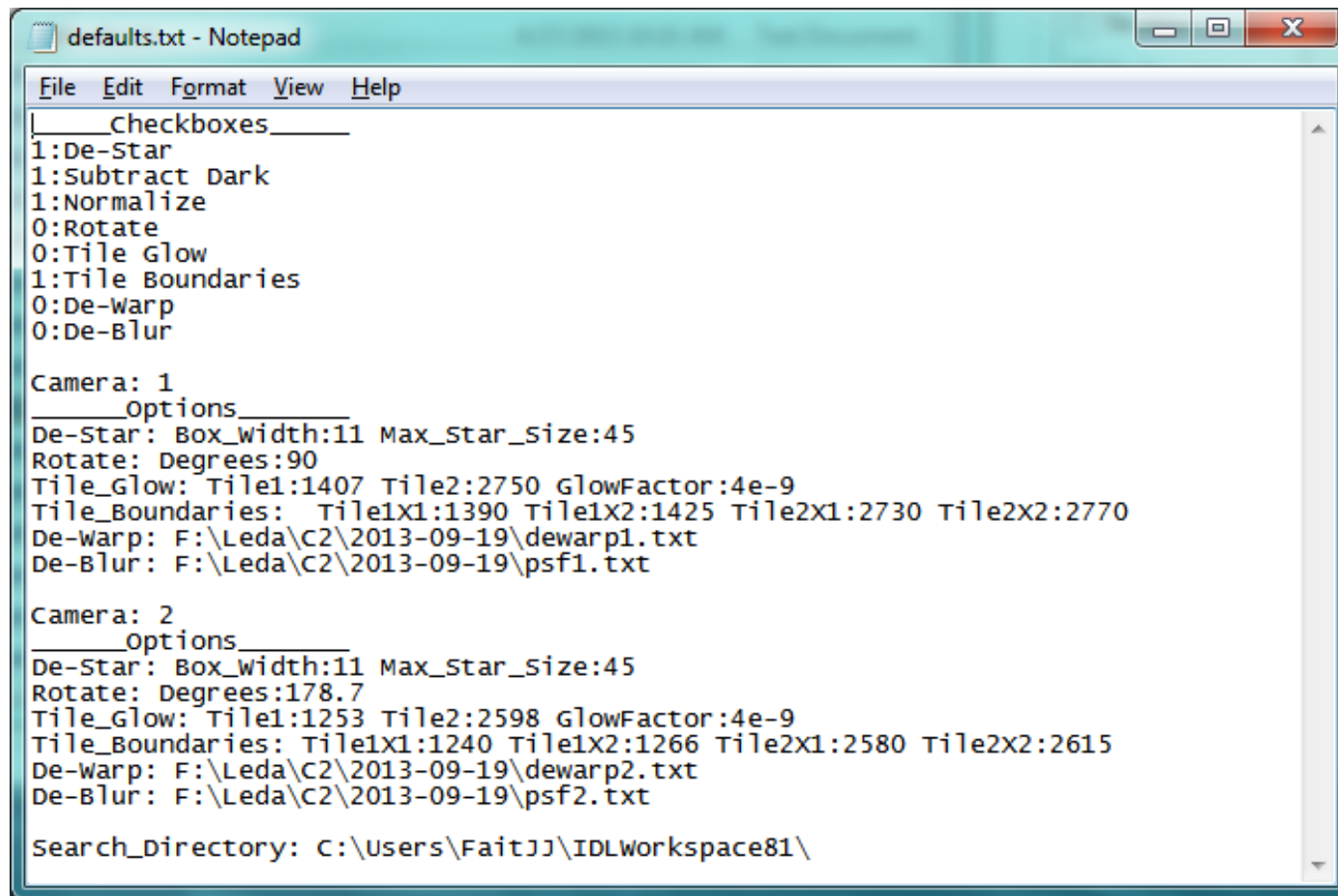
☐ Change Directory

Directory: ars\FailJNDLWorkspace81\C1 C2\

Change Defaults Load Defaults

Make Batch File Process Batch File

Default Options



```
File Edit Format View Help
|____Checkboxes____|
1:De-Star
1:Subtract Dark
1:Normalize
0:Rotate
0:Tile Glow
1:Tile Boundaries
0:De-warp
0:De-Blur










Camera: 1
|____options____|
De-Star: Box_Width:11 Max_Star_Size:45
Rotate: Degrees:90
Tile_Glow: Tile1:1407 Tile2:2750 GlowFactor:4e-9
Tile_Boundaries: Tile1X1:1390 Tile1X2:1425 Tile2X1:2730 Tile2X2:2770
De-warp: F:\Leda\C2\2013-09-19\de warp1.txt
De-Blur: F:\Leda\C2\2013-09-19\psf1.txt

Camera: 2
|____options____|
De-Star: Box_Width:11 Max_Star_Size:45
Rotate: Degrees:178.7
Tile_Glow: Tile1:1253 Tile2:2598 GlowFactor:4e-9
Tile_Boundaries: Tile1X1:1240 Tile1X2:1266 Tile2X1:2580 Tile2X2:2615
De-warp: F:\Leda\C2\2013-09-19\de warp2.txt
De-Blur: F:\Leda\C2\2013-09-19\psf2.txt

Search_Directory: C:\Users\FaitJJ\IDLWorkspace81\
```

- Located in same directory as radpro.sav

Files Nomenclature

 c1Shot2731_proc.png	4/22/2015 10:23 AM
 c1Shot2731_proc.TIF	4/22/2015 10:23 AM
 c1Shot2731_DS_N.TIF	4/22/2015 10:23 AM
 c1Shot2731_DS.TIF	4/22/2015 10:23 AM
 c1Shot2731_DS_Reject.TIF	4/22/2015 10:23 AM
 c1Shot2731_DS_Map.TIF	4/22/2015 10:23 AM
 2731_Options.txt	4/22/2015 10:22 AM
 Shot2731.txt	4/22/2015 10:22 AM
 Shot2731df.txt	4/22/2015 10:22 AM

- c1Shot2731_proc.TIF – Processed image
- c1Shot2731_DS.TIF – Destar images
- 2731_Options.txt – Checkbox/Option Params
- Shot2731(df).txt – Tiff header info

Enhancements

- Processing FXR/NRL data
- Portability – Directory structure flexible
- Editable dose information for batch processing
- Dual Shot included for batch processing
- Correcting for curved Tile Boundaries
- Avg. Destar ~30 seconds, other algorithms ~5 minutes
- Custom algorithm to replace FILE_SEARCH
 - Faster on mapped drives
 - One case showed 16x speedup (S: Drive)
- Batch Mode
- Auto Scale – Histogram
- Drag 'n Drop images



Additional Enhancements

- Middle Mouse Button Zoom/Box Zoom
- Edit Color Table
- Resizable Image Window
- Options update based on camera selection
- Tested on Window 7/Mac OS X



Future & Summary

- Implementing T. Tunnell's latest, additional De-Star functionality
- Use the mask from De-Star to auto-correct Tile Boundaries
- Including improved Tile Glow algorithm
- Handle tile boundary mask with more than 2 regions (Including bad column data)
- Flexibility to De-Star Shot and not Flat

