

proctool_owl_v2.1

AisaOWL pre-processing tool

quick operation instructions

Doc.Ver. 1.1

30.05. 2014 / Hannu Holma, Specim

System requirements

- Operating system: 64 bit Windows

Installation

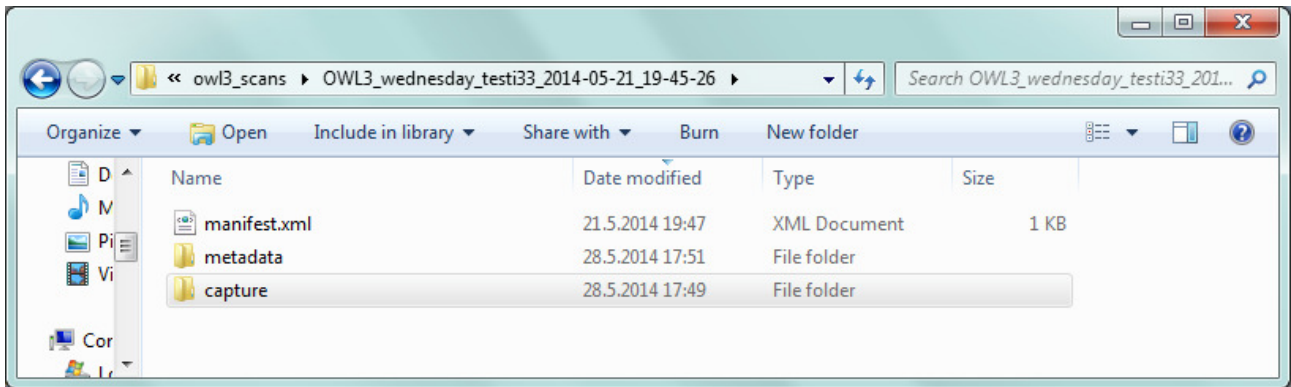
1. Run Matlab MCR (MCR_R2013a_win64_installer.exe) and follow instructions.
2. Copy Owl processing tool “proctool_owl.exe” to your processing folder.
3. Copy “sensor.dat” file to your processing folder.
4. Processing tool is ready for use.

Data acquisition settings

- There are many settings (workflow) possible in data acquisition software. They must be set correctly to result compatible data for processing tool:
 - Collect data cubes with **“Image with GPS-data, embedded dark with thermal images”** workflow.
 - Radiometric calibration measurements (called as “thermal images” in workflow) are automatically acquired every time with the measurement.

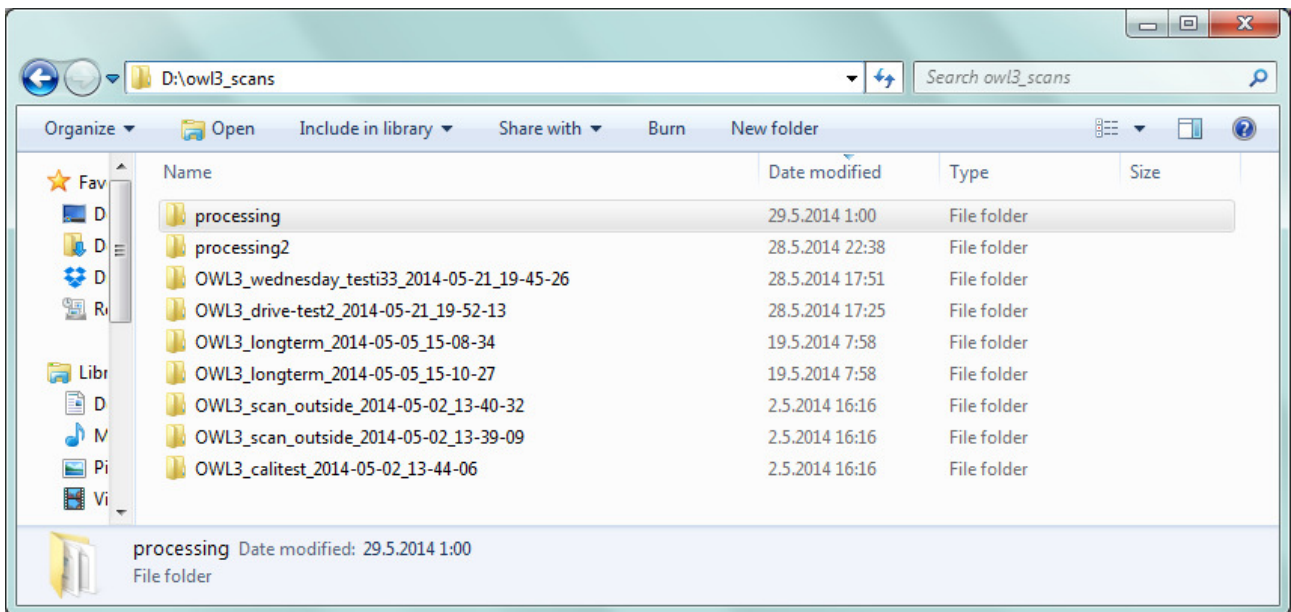
Pre-processing

- AisaOWL data is stored as “datasets” by data acquisition software (see figure)

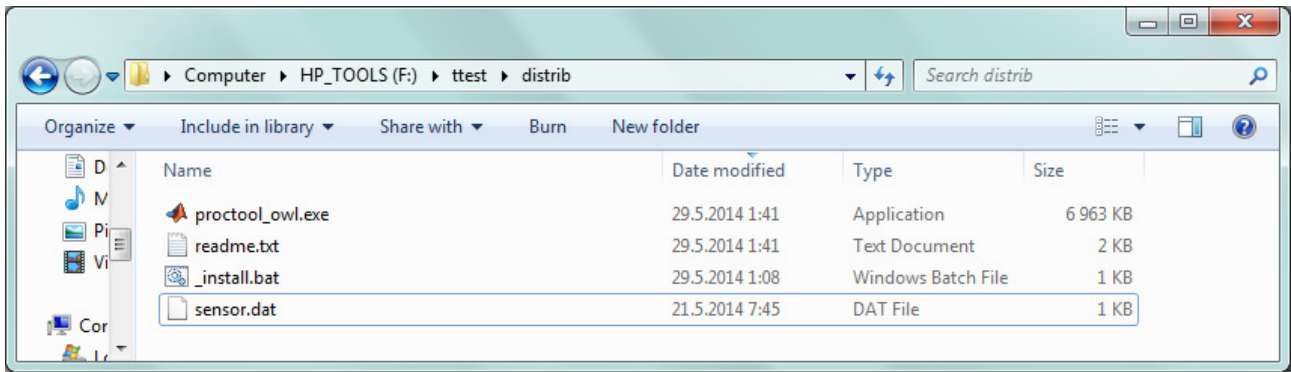


- These datasets are acquired and stored automatically by data acquisition software and **their structure may not be modified!**
- Processing folder needs to have space of about four times of the file to be processed.
- Place in folder structure is not restricted.
- “sensor.dat” file must be copied to processing folder. It includes image sizing parameters that are sensor specific and **may not be changed.**

Example of folder structure containing two processing folders and several datasets:



Note that processing folders might also be somewhere else in the computer as in next example of contents of processing folder before start of processing:



Inputs :

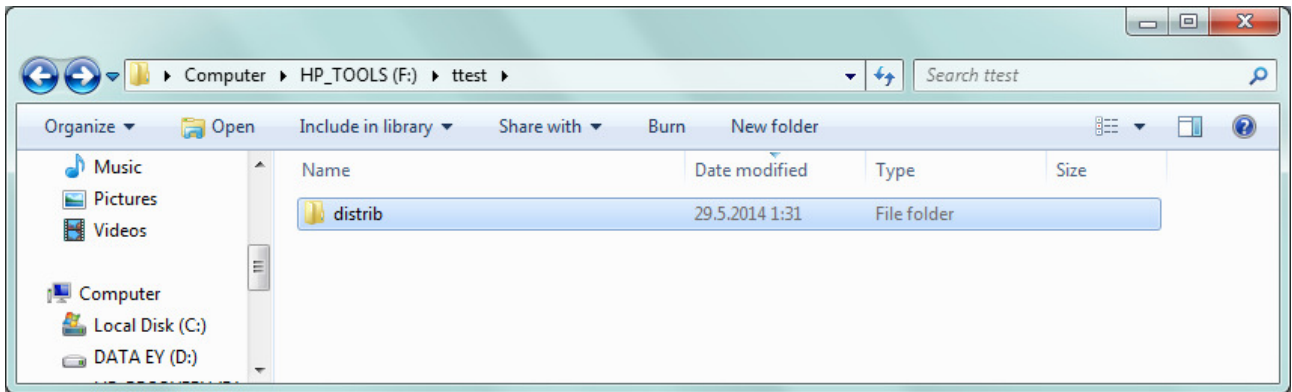
- proctool_owl demands four inputs:
 - Dataset name that will be processed with full folder path.
 - Optionally radiometric calibration file.
 - Optionally blinking pixel file.
 - Optionally processing modifiers.
- The optional inputs have to be set as empty strings (“”) if not used.
- Processing tool is looking for blackbody measurement files from the same folder as the file to be processed in the dataset if radiometric calibration file has not been specified. There must be two files: one of them with “T1_” and the other with “T2_” somewhere in the file name. Corresponding target blackbody temperatures for these calibration files are specified in their hdr-files.

Outputs:

- If radiometric calibration file is not set as input it is generated and stored in processing folder.
- If blinking pixel file is not set as input it is generated and stored in processing folder.
- Final pre-processed data file (with ending “_proc.dat”) is stored in processing folder.

Executing proctool_owl and messages during processing:

- Proctool_owl is started in Windows command prompt. Easiest way to open command prompt is to open file explorer and browse folder structure so that processing folder is visible in the list like folder “F:\ttest\distrib” in following image. Now by pressing shift while right-clicking on the folder name you can choose “Open command window here” from menu.



- Progress of processing and names of used and generated files are prompted but log-file is not generated (software will be updated for that later).
- Example run of proctool_owl without optional inputs:

```

C:\windows\system32\cmd.exe
proctool_owl.exe F:\OWL3_scan_outside_2014-05-02_13-40-32 ' ' ' '
F:\ttest\distrib>proctool_owl ver 2.0 (c) Specim 28.05.2014

Source file: F:\OWL3_scan_outside_2014-05-02_13-40-32\capture\OWL3_scan_outside_
2014-05-02_13-40-32.raw
Phase: 0/6 - Radiometric calibration.
Blackbody measurement 1(T=278.15K): F:\OWL3_scan_outside_2014-05-02_13-40-32\cap
ture\T1_OWL3_scan_outside_2014-05-02_13-40-32.raw
Blackbody measurement 2(T=303.15K): F:\OWL3_scan_outside_2014-05-02_13-40-32\cap
ture\T2_OWL3_scan_outside_2014-05-02_13-40-32.raw

Read files...
50% 100% 50% 100%
Calculate radiometric coefficients...
10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Writing calibration file...
Phase 1/6
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%
Phase 2/6
Read autodark...
Find BP...
Write blinkers to file: F:\ttest\distrib\OWL3_scan_outside_2014-05-02_13-40-32_b
linkers.dat
Replace blinkers...
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%
Phase 3/6
Collecting reference...
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99% Calculating...
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%

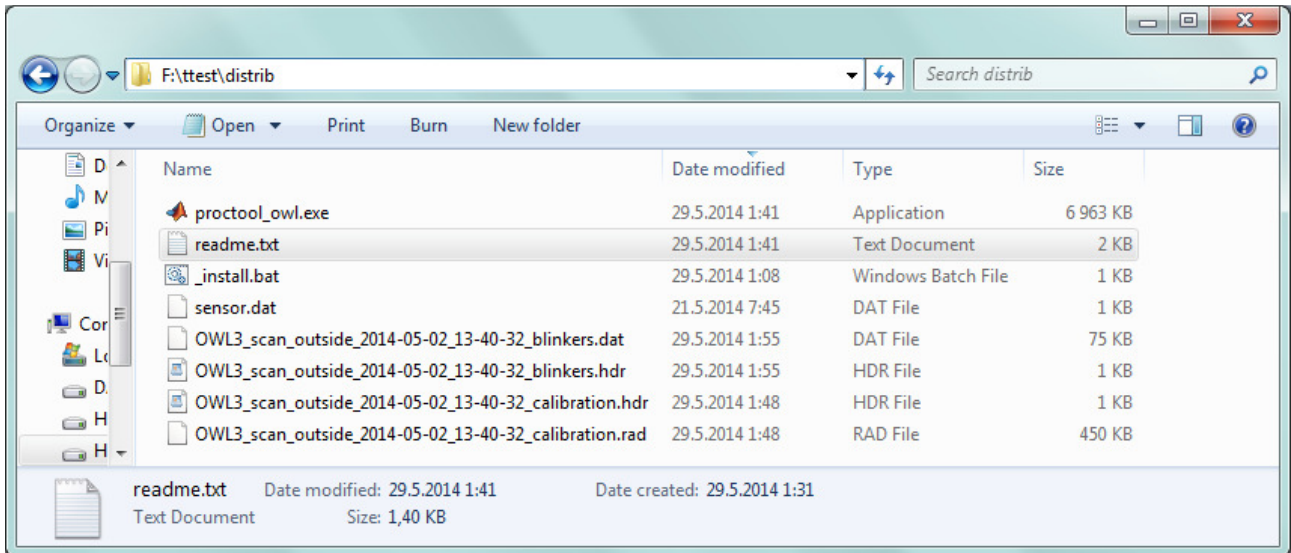
Phase 4/6
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%
Phase 5/6
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%
Phase 6/6
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%

F:\ttest\distrib>
F:\ttest\distrib>

```

- The example processes dataset “OWL3_scan_outside_2014-05-02_13-40-32” that was stored in folder “D:\owl3_scans\”. Input is then “D:\owl3_scans\OWL3_scan_outside_2014-05-02_13-40-32”.
- Radiometric calibration file input was not specified (input is “ ’ ’ ”) and processing tool then generates the file and stores as “OWL3_scan_outside_2014-05-02_13-40-32_calibration.rad” in processing folder. Any string that is not a proper file name with valid path is ignored and calibration file will be calculated.

- Blinking pixel file was not specified either and it is also generated (with ending “_blinkers.dat”) during processing. The same rule as for radiometric calibration file input format and validity of file name apply also for blinking pixel file input.
- Resulting data file goes to dataset as seen in figure It has the original file name with ending “_proc”.
- Resulting contents of processing folder looks like:

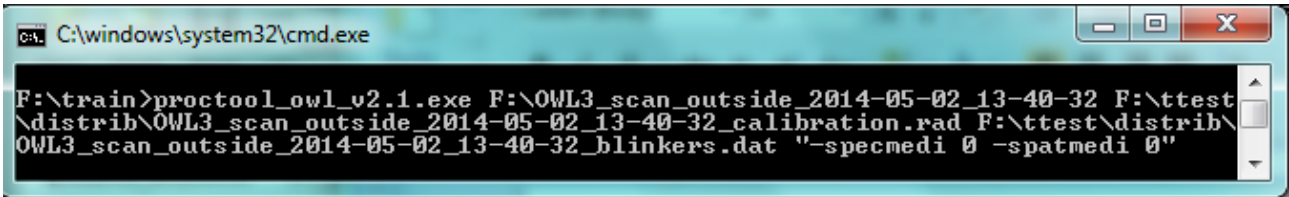


Using modifiers in processing

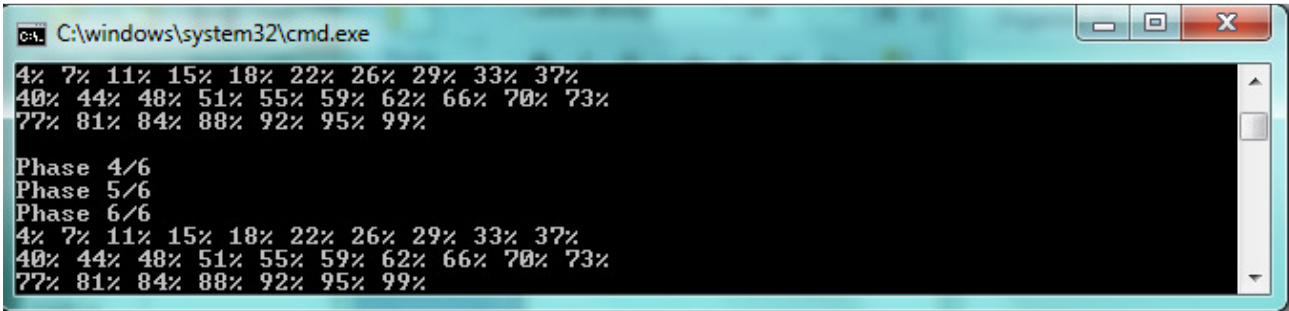
User may effect on a couple of processing parameters using following processing modifiers:

Modifier	Parameter	Description
-specmedi	uneven integer	Median filter window (0 means that filtering is not applied).
-spatmedi	uneven integer	Spatial window filter (0 means that filtering is not applied).
-pixstabi	float	Maximum standard deviation of signal of a pixel in blinking pixel search.
-measmode	string 'scan'	Spatial uniformity improvement is performed based on autodark if this modifier is given.

An example of using a modifier “-specmedi” with parameter “0”:



```
C:\windows\system32\cmd.exe
F:\train>proctool_owl_v2.1.exe F:\OWL3_scan_outside_2014-05-02_13-40-32 F:\ttest\
\distrib\OWL3_scan_outside_2014-05-02_13-40-32_calibration.rad F:\ttest\distrib\
OWL3_scan_outside_2014-05-02_13-40-32_blinkers.dat "-specmedi 0 -spatmedi 0"
```



```
C:\windows\system32\cmd.exe
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%
Phase 4/6
Phase 5/6
Phase 6/6
4% 7% 11% 15% 18% 22% 26% 29% 33% 37%
40% 44% 48% 51% 55% 59% 62% 66% 70% 73%
77% 81% 84% 88% 92% 95% 99%
```

Processing skips steps 4 and 5 as is seen from the second image due to modifiers.

All of the modifiers must be included in the same string like in the above example: “-specmedi 0 -spatmedi 0” in double quotes.