simactive

Running Correlator3D Via Python Scripts

QUICKSTART GUIDE

OVERVIEW

Correlator3D (C3D) has been developed to run in both the graphical user interface (GUI) and in command-line mode. The latter gives the user the option to create scripts that can be executed via batch files, through the Python programming language. This method only requires a minimal amount of programming, along with the associated files to execute a processing workflow.

This guide will describe the process of creating a Python script along with the files required to run a project in Correlator3D.

PROJECT SETUP

In addition to C3D, users will need to install Python which can be downloaded from the following address:

https://www.python.org/

Prior to processing, an exterior orientation (EO) file containing the image names and corresponding coordinates (X, Y, Z and possibly omega, phi, kappa angles) is required. If the EO data are stored within the EXIF of the image, an extraction tool such as ExifTool can be used:

https://exiftool.org/

Additionally, a directory structure will be needed to store the input data. In the following example, the name used will be:

E:\SIMACTIVE\Demo_Data\SCRIPT_STANDARD_PROJECT\REQUIRED_FILES

EXIF EXTRACTION

If EO information is available as a TXT or CSV file, no extraction is needed. If it is stored in the images, the following command line can be used to extract EXIF coordinates from the images:

```
Exiftool -T -filename -gpslongitude -gpslatitude -gpsaltitude -n
E:\SIMACTIVE\Demo_Data\SCRIPT_STANDARD_PROJECT\IMAGES\*.JPG
E:\SIMACTIVE\Demo_Data\SCRIPT_STANDARD_PROJECT\EO.csv
```

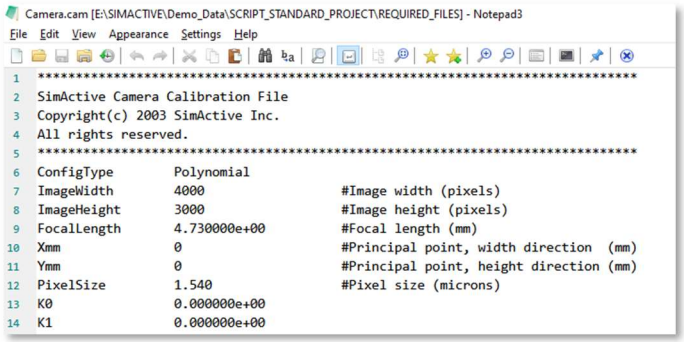
The converted EO file should then be placed in the REQUIRED_FILES folder. Two additional files to be included in that folder prior to processing are:

- Camera calibration file
- C3D Script.spt file

Each can be generated as per the instructions described in the following sections.

CAMERA CALIBRATION FILE

The following figure shows a standard calibration file used by C3D. The values should be modified to match the camera used for a specific project.

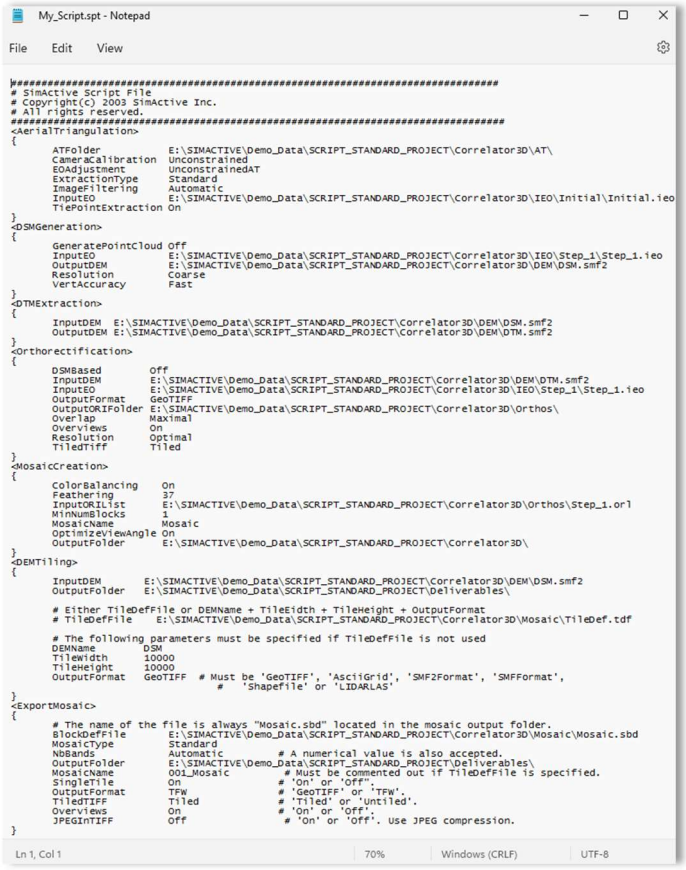


C3D SCRIPT FILE

An example of a script file, which can be modified to fit specific processing requirements, can be found in the following directory:

\Program Files\SimActive\Correlator3D\Sample Files\Script Folder

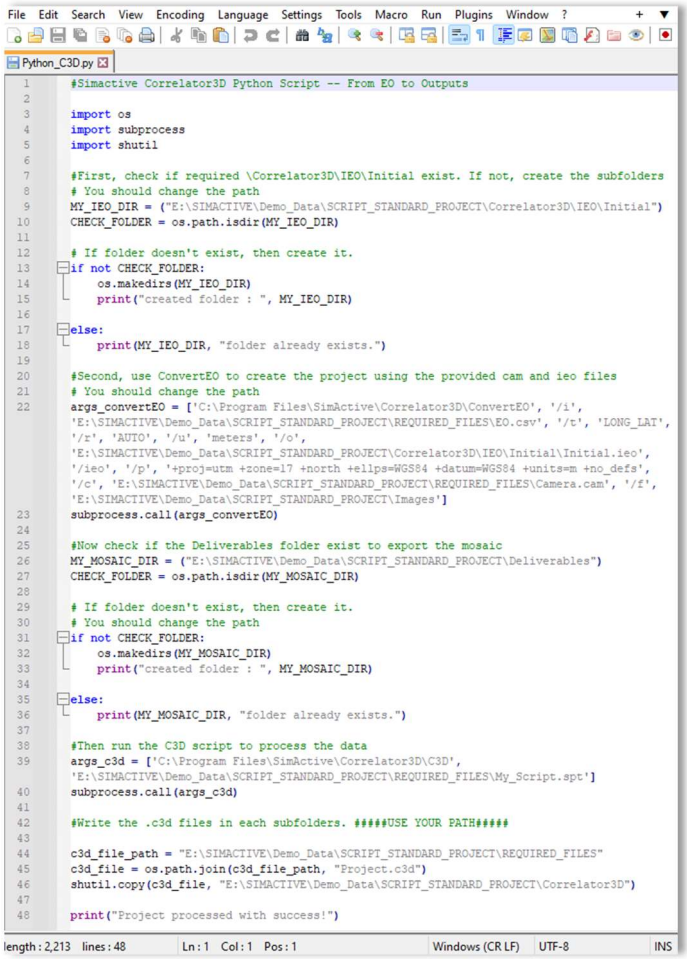
The C3D_Script.spt file includes all the processing options available in C3D. Users can modify a copy of the file and change values to match processing needs. In the following example, it is called My_Script.spt.



CREATING THE PYTHON SCRIPT

Once the extracted EO, the camera calibration file and the C3D_Script.spt files have been created and placed in the REQUIRED_FILES folder, a Python script can be produced. The following figure shows a sample script file (Python_C3D.py) that is designed to complete the following steps:

1. Check if the required folders exist and if not, create them.
2. Use ConvertEO (a program included with a C3D installation) to create the project using the provided camera and EO files.
3. Check to see if the Deliverables folder exists allowing the export of the mosaic. If not, create this folder.
4. Run the C3D script file (My_Script.spt).
5. Write the C3D files into the project folder.



PROCESSING

From the command prompt, the newly created Python script (Python_C3D.py) can be simply executed. Once the Script is completed, it will prompt a "Project processed with success" message.

Upon completion, a C3D project file (.c3d format) will have been created, which allows the visualization of the results within the GUI. The template .c3d file located in the REQUIRED_FILES folder can be simply copied and pasted in the Correlator3D folder where the project has been created. Then the project file can be opened in C3D.