Automating Agisoft Metashape Model Building

This is a tutorial for setting up and running multiple models in sequence on the command line through Agisoft Metashape. In essence, this creates separate scripts for each model that will be built, and these scripts will be run through Metashape one after another. We have created this method as a work-around for various intricacies of Metashape. Metashape requires a connection to a local display. This connection is lost when Metashape finishes a model so when running the program on a detatched screen, the next model will not be started. As such, we recommend using a desktop or laptop with an ethernet connection to maintain a constant connection to the server when running Metashape.

Access your remote computer using the -XY flags for ssh. This allows for a safe, forwarded connection from the server to your local display. Metashape requires this connection to a display in order to function on a remote server.

Setting up photos for automated model building

1. Ensure all photos for a single model has been put into its own subdirectory. I do this before transferring photos to remote system but it helps to check that photos uploaded properly.

```
Main/Photo_Set1
Main/Photo_Set2
Main/Photo_Set3
```

2. Create a list of absolute file paths to each of the subdirectories in the Main directory

```
ls -d -1 $PWD/** > FragDirs.txt
```

    a. Check that FragDirs.txt is in Main/ and that it contains absolute file paths to subdirectories

Creating unique Python scripts for run each group of photos

3. Change working directory to location of Metashape software
    a. This is the directory created when you unzipped Metashape when installing i.e. metashape-pro_1_5_4

4. Create a base script that will run Metashape with given settings for each of your groups of photos.
    a. This script will act as a template with place holders that will be filled using the absolute file paths of your groups of photos. You can change model building settings in this base script that you want all models to run on.

b. See metashapeBase.py and metashapeBaseDepthMaps.py as examples

5. Generate unique python scripts that will run Metashape for each group of photos included in FragDirs.txt

```
./Meta_expand.sh ~/Main/FragDirs.txt
```

   a. Check to see if new .py scripts were created in metashape-pro_1_5_4 directory
   b. Make new scripts executable

```
chmod +x *.py
```

You can also change Metashape settings on each of these new scripts manually. This is useful when you know one or two models will require higher quality camera alignment or depth map.

Build multiple models in Metashape without further user input

6. Use a bash script to call photosets to be automatically submitted in sequence to Metashape
   a. Use wildcards in metashapeLoop.sh to specific which groups of photos will be run with each job

```
metashapeLoop.sh > output.txt
```