Aug 14, 2019

Spectral photogrammetry protocol V.2

PLOS One

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1 Works for me dx.doi.org/10.17504/protocols.io.zzgf73w

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EXTERNAL LINK

https://doi.org/10.1371/journal.pone.0220949

THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION

Mathys A, Semal P, Brecko J, Spiegel DVd (2019) Improving 3D photogrammetry models through spectral imaging: Tooth enamel as a case study. PLoS ONE 14(8): e0220949. doi: 10.1371/journal.pone.0220949

Acquisition

1 Place de specimen at the center of the turntable with scales, photogrammetry marker and MSI calibration card (CHSOS).

2 Setup lamp and camera distance. Place the camera at approximately 30°.

3 Setup the correct exposure for each wavelenght and verify that the exposure is correct in spectrashoot using the MSI calibration card. Adjust exposure until the specimen is correctly lit.

4 Start capturing: for one specimen position capture at all the 15 wavelengths + white light. Then add the UV-pass filter and capture pictures in the UV wavelengths (UVR). Next place the UV-cut off filter and capture picture for each UV wavelengths (UVF). Pictures should be capturated in raw format.

5 Rotate the turntable of 10° and repeat step 4. Do this for the complete rotation.

6 Move the camera at an angle of 60° at the approximately the same distance than previously and repeat the operation for the complete rotation.

7 If necessary turn the specimen and repeat the process for as many rotation/views as necessary.

Pre-processing

8 Separate the wavelengths in different folders.

Processing

9 Open Agisoft Photoscan and create a chunk for each wavelengths (rename the chunks accordingly). Import the pictures.

10 Go to workflow > batch process and add the following step: align pictures (highest), build dense cloud (high), build mesh (high).

11 Repeat the processing 3 times to make sure the results are reliable.

12 If the results are reliable, export the models as .stl for surface analysis.