TSA Survey School – Photogrammetry & Digital Imaging Short Course

Three Day Course

Course Programme

The **first day** of the course concentrates on digital imaging for photogrammetry. It includes much on the taking of photography and becoming aware of the effects of different settings. It covers field of view, depth of field/focus, aperture/speed priority, metering, resolution, distortion, ISO ratings, pixel size, formats, lenses, coverage/overlap, etc. An important part of this is camera calibration and although the multi-image software includes automatic calibration there will be a session on the first afternoon calibrating the cameras that the students will bring with them. This also doubles as a practical in applying the different parameters to achieve good imagery.

The **second day** starts with a brief definition and history of photogrammetry to place today's advances in context. It continues with theory including parallax (due to tilts and relief displacement), mathematical conditions to be met for convergence and the orientation process. Examples follow for stereo and multi-image methods while discussing the theory. A workflow for multi-image methods stressing the planning, field checking and quality control at each stage of the process is included in this session. The discussion concludes with the advantages and disadvantages of photogrammetry versus other methods.

On the afternoon of the second day the students will take some outdoor imagery of the school building, the car park and/or the road adjacent to the building. It allows the student to obtain further experience in camera manipulation and, more importantly, coverage of the subject. This practical exercise gives the students a dataset to work with for the rest of the afternoon and some of the third day.

The **third day** begins with a presentation on ortho and rectified photography (partly covered in the photography and photogrammetry sessions) as a brief focus. Some of the time an orthophotograph may be the only output required to act as a backdrop for a GIS or for architects' elevations.

The remainder of the course time is spent on the three school workstations (maximum of two per computer as the course is limited to six students) so that the students can gain practical experience on (usually) three different software suites (eg, Agisoft Photoscan, Pix4Dmapper, Bentley ContextCapture, EOS Photomodeler, etc.). For the practical sessions there are a number of aerial and architectural datasets available on the workstations for the students to experiment with.

If required the tutor will demonstrate a workflow to include observation of control points for geo-referencing and a brief look at vector data collection in 3D even though this type of software is not geared up for photogrammetric mapping. This largely remains the domain of traditional stereo photogrammetry and this is the reason that this is covered in the theory.

Note: The text in green describes the practical/hands-on sections of the course.