

## THE POTENTIAL OF AUTOMATED TARGET-FREE CAMERA CALIBRATION

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Commission I, WG I/3

**KEY WORDS:** Camera Calibration, Automation, Target-Free Orientation, UAVs, Multi-Lens Cameras

**ABSTRACT:**

Automatic photogrammetric calibration of medium- and small-format cameras via the self-calibrating bundle adjustment approach has traditionally required the use of coded targets for initial network orientation. The introduction to the photogrammetric community of so-called structure-from-motion techniques over recent years, however, has facilitated target-free automated orientation via feature-based matching (FBM). The FBM approach is very advantageous for various types of applications, as well as for cases where the use of artificial targets might be not possible or preferable, for example when orienting low-level aerial imagery, as with UAVs. With recent innovations, principally improved accommodation of wider camera baselines and convergent imaging geometry, automated FBM-based orientation is becoming increasingly more suitable for camera self-calibration. This presentation discusses the potential of automated target-free camera calibration, especially in relation to the in-field calibration of both cameras on terrestrial mobile mapping and UAV platforms, and multi-lens camera configurations. Practical examples of automated FBM-based self-calibration are reviewed, and these highlight the flexibility and accuracy of the approach in situations where the scene or object being imaged is texture rich and conducive to the target-free approach.