

Stuttgart, July 21, 2003



EuroSDR network Digital Camera Calibration

Dear colleague,

EuroSDR formerly known as OEEPE has started an initiative to investigate the future of camera calibration.

There is a definite need for sensor calibration in the photogrammetric and remote sensing community which is fully supported by the national mapping agencies represented in EuroSDR. For analogue cameras we usually deal with a camera calibration protocol, which is an established procedure worldwide. So far, there are clear calibration standards established and the calibration process itself is conducted by an impartial party. The overall quality of the sensor data is ensured to the end-user.

With the introduction of digital aerial cameras, their (necessary) integration with other sensor systems like GPS and IMU, topics of absolute radiometric calibration, there will arise the need to ask the questions: a) How is camera calibration performed? b) How is certification done?

The Steering Committee of EuroSDR has established a core network of key researchers in this field to initiate a research project inside EuroSDR with the goal to derive **the technical background for calibration procedures** for digital cameras based on scientific theory and empirical investigations. The legal and organizational aspects for certification are put to the background for the time being.

Members of this core network are so far:

- Dr. Michael Cramer, Institute for Photogrammetry (ifp), University of Stuttgart, project leader EuroSDR (Network Digital Camera Calibration)
- Prof. Risto Kuittinen, Head of Finnish Geodetic Institute and President of EuroSDR
- Dr. Ismael Colomina, IdeG, President of Commission 1 of EuroSDR
- Dr. Hartmut Ziemann, University of Applied Sciences, Dessau, Project leader EuroSDR (Test of digital cameras)

To increase acceptance by the camera producers we cordially invite you to participate in the network and the formulation of such a project as well as in the later participation.

The development of generally accepted procedures would not only support producers and users of digital cameras, but supplies also additional means for potential users of digital cameras to investigate their features.

We propose an initial planning meeting during the Photogrammetric Week 2003 in Stuttgart on

Thursday, September 4th, 2003
14:00-15:30
Room 2.343, Geschwister-Scholl-Str. 24, Building D
(ifp building, entrance corner Kepler-/Kriegsbergstr., 2nd floor)

to discuss and elaborate on the project idea, which is described in more detail in the following:

Agenda

Status

- What is the general status of digital camera calibration procedures?
- What do other organizations (ISO, ISPRS, ASPRS, CEOS, EUROGI, ...) do?
- How is calibration performed by the camera producers?

Concepts for calibration procedures

- What is expected from digital camera calibration?
- Is the calibration restricted on the optic parts only or should additional sensors like GPS/inertial components being involved?
- Is there a need for laboratory and/or test field calibration?
- Does calibration include only the geometric part or should radiometry be covered also?
- Is there a realistic chance to design an accepted and practicable camera calibration strategy, which could be recommended for future digital cameras?
- What about stability, reliability, validity aspects of calibration parameters?

Experimental research

- Should EuroSDR go into experimental testing of digital camera calibration? What are the project goals?
- If so, who is interested in participating such tests and who could provide the appropriate test facilities (laboratory equipment, test site) and human power?
- Will camera producers support such test campaigns providing their digital systems?
- Are there any general recommendations on test design and procedures?
- Which software modules are available for processing?

Miscellaneous

The first topic is focused on the scientific background and should give an overview on established calibration methods. All participants are invited to participate in this research and to submit their (publicly available) experiences, which will be summarized in an extensive

report later. Such summary will help to create a common knowledge base for the formulation on future strategies and experimental work within this project. Additionally, this status report could be helpful for digital camera system users to gain their experience with digital camera calibration aspects. General concepts of camera calibration should be discussed in the second topic. Based on the experiences and advice of individual experts, aspects of a commonly accepted procedure for camera calibration and testing might be developed in the ideal case. The outcome of the third topic should help to establish the future guidelines in this project, finally.

We would be very happy to meet you (or any other expert involved with camera calibration tasks) in Stuttgart and we would appreciate the input from your side on this project idea.

Please inform

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if you or one representative of your organisation is going to participate.

Yours sincerely,

Dr. Michael Cramer, Project leader, Network Digital Camera Calibration
Dr. Ismael Colomina, President of Commission 1, EuroSDR
Dr. Eberhard Gülch, President of Commission 3, EuroSDR