

Titel:/Title:/Titre:

Error detection in some elementary photogrammetric procedures.

Autor(en)/Author(s)/Auteur(s):

F. Amer

Zusammenfassung:/Abstract:/Sommaire:

The problem of error detection in some elementary photogrammetric procedures is investigated.

Error free data was simulated to which different types of errors (random, systematic, gross) errors have been added and used in the least squares adjustment.

Different procedures of error detection have been used.

The summary of the results are given with some conclusions.

Titel:/Title:/Titre: ON THE DEVELOPMENT IN THE FIELD OF ISP
COMMISSION III DURING 1976-1980

Autor(en)/Author(s)/Auteur(s): I.T.ANTIPOV

Zusammenfassung:/Abstract:/Sommaire: THE COMMISSION III PRESIDENT'S
REPORT

Titel:/Title:/Titre:
METHODES DE CORRECTION GEOMETRIQUE DES IMAGES FOURNIES PAR LE
SYSTEME SPOT

Autor(en)/Author(s)/Auteur(s):

B. CABRIERES, P. KELLER, M. RAYSSIGUIER

Zusammenfassung:/Abstract:/Sommaire:

On montrera, en s'appuyant sur les spécifications de la mission SPOT et sur les simulations de l'orbite, de l'attitude et de l'instrument, comment on envisage une modélisation physique de la prise de vue et la rectification de l'image pour tenir les performances géométriques annoncées des produits.

Titel:/Title:/Titre:

New Method of Analytical Terrestrial Photogrammetry -
Analytical Separate Solution.

Autor(en)/Author(s)/Auteur(s):

Dr. Jozef Čerňanský, Slovak Technical University Bratislava ČSSR

Zusammenfassung:/Abstract:/Sommaire:

Here is presented the new method of analytical terrestrial photogrammetry with name "Analytical Separate Solution". By this method are corrected parameters of each photographs by resection on basic measured image coordinates and geodetically measured angles. The horizontal and vertical angles measured from phototheodolit stations are corrected to the perspective centers. Coordinates of perspective centers were determined geodetically. The corrected horizontal and vertical angles were used to determine the real image parameters. The ground coordinates are being determined by intersection from perspective centers using the image angles.

Titel:/Title:/Titre:

DIGITAL COLOR CALIBRATION TECHNIQUE

Autor(en)/Author(s)/Auteur(s):

James C. Deigan

Zusammenfassung:/Abstract:/Sommaire:

A color film recorder may theoretically produce more than 16 million discrete repeatable hues over the minimum (-white) to maximum (-black) optical density range of a color film, and do so for each of up to 83 million pixels ("picture elements" within a precision matrix) on a single 23cm film. A common LANDSAT scene containing 7 1/2 to 10 1/2 million pixels can be recorded in about half an hour, with color balance under total digital control. Calibration procedures and techniques for the generation of a digital color image from either magnetic tape or an unenhanced photograph will be explained.

Titel:/Title:/Titre:

Geometrical Rectification of Overlapping Scanner Imagery
using a Modified Anblock Method

Autor(en)/Author(s)/Auteur(s):

R.-D. Düppe , W.M.Göpfert

Zusammenfassung:/Abstract:/Sommaire:

For the rectification of strips and blocks of overlapping aircraft/satellite scanner imagery a suitably modified block adjustment program is employed. First scanner image coordinates are automatically combined to models, i.e. area segments, using a triangular mesh-algorithm. Then a block adjustment with the Anblock method is performed introducing additional fictitious observations for the transformation parameters as well as for the center coordinates of the individual models. Observational weights are taken inversely proportional to the distance from the flight profile. In a final processing step digital geometrical rectification using the pass-point method applied to multiquadric equations is employed to yield final outputs such as scanner-mosaics of cartographic accuracy. Practical experiences and results are presented.

Titel:/Title:/Titre:

Status of Software in Digital Mapping

Autor(en)/Author(s)/Auteur(s):

Dr. Atef A. Elassal

Zusammenfassung:/Abstract:/Sommaire:

A survey of existing activities in software for Digital Mapping was conducted among mapping organizations around the world. Results of the survey are analyzed with the objective of detecting evolving trends for automating cartography. A current and up-to-date status of organizational objectives in the general field of Digital Mapping is presented.

Titel:/Title:/Titre:

Commission 3

The General Bundle Adjustment Triangulation (GEBAT) System
- Theory and Applications

Autor(en)/Author(s)/Auteur(s):

Dr. S.F. ElHakim
Dr. W. Paig

Zusammenfassung:/Abstract:/Sommaire:

The availability of highly accurate and dense control networks is a major requirement for large scale urban mapping, as well as for various engineering projects.

Although advanced photogrammetric systems have achieved a level of accuracy which makes their practical applications generally feasible, even in urban situations, additional data still can improve the results. Geodetic observations, even if they are not sufficient for a terrestrial network, provide excellent constraints to the photogrammetric adjustment and also reduce absolute control requirements. Although the idea of a simultaneous geodetic and photogrammetric adjustment is not new, the method used in this approach appears to be more rigorous as it does not rely on approximations. Here, a modern three dimensional geodetic mathematical model is combined with a photogrammetric bundle adjustment with self calibration. A number of tests based on real as well as simulated data is presented in this paper.

Titel:/Title:/Titre:

EXPERIMENTS OF POST-CALIBRATION IN THE BLOCK ADJUSTMENT

Autor(en)/Author(s)/Auteur(s):

INGHILLERI Giuseppe

Zusammenfassung:/Abstract:/Sommaire:

The post-calibration consists in computing the parameters of the systematic error of the stereomodel from the residuals of the points after the block adjustment. The theory of the post-calibration is demonstrated. The results of some experiments performed with simulated blocks and observed blocks are shown and discussed.

Titel:/Title:/Titre: ACCURACY OF MARKING POINTS ON AERIAL PHOTOGRAPHS OF DIFFERENT SCALES

Autor(en)/Author(s)/Auteur(s): Iljin L.B.

Zusammenfassung:/Abstract:/Sommaire: The paper deals with an accuracy of artificial point marking on aerial photographs of different scales. The results of researches on photographs of different scales to be observed are given in the paper. The main sources of accuracy decreasing when sighting stereopairs composed of photographs of different scales are revealed. Some recommendations for practical use are set forth.

Titel:/Title:/Titre: Götterdämmerung over Least Squares Block Adjustment.

Autor(en)/Author(s)/Auteur(s): Jens Juhl and Kurt Kubik, Aalborg University Centre.
Torben Krarup, Geodetic Institute.

Zusammenfassung:/Abstract:/Sommaire:

With the inclusion of systematic image errors and automatic techniques of gross error detection the least squares photogrammetric adjustment has reached an end stage in development, in which an objective determination and separation of "systematic" and "gross" errors becomes impossible.

The authors propose new lines of thought which resolve this deadlock and allow the direct allocation of various error sources.

Titel:/Title:/Titre: Bundle adjustments with additional
parameters of the testblock Appenweier

Autor(en)/Author(s)/Auteur(s): H. Klein, Stuttgart University

Zusammenfassung:/Abstract:/Sommaire:

Results of various block adjustments from the controlled testblock Appenweier are presented. The correction of systematic errors by selfcalibration with respect to control point distribution, overlap and number of additional parameters are analysed. The selection of parameters by statistical criteria and the constancy of the parameters are discussed.

The effectiveness of the method is demonstrated by the improvement of the absolute accuracy and the resulting image coordinate accuracy of 2 μm .

Titel:/Title:/Titre:

The use of refined auxiliary data in strip and block adjustments

Autor(en)/Author(s)/Auteur(s):

J. Kure, M.M. Radwan

Zusammenfassung:/Abstract:/Sommaire:

The auxiliary data residuals are analysed after an adjustment and the method of least squares interpolation used to refine the data, which is then used in an additional adjustment.

This paper describes the potentials of the method and indications of optimum configurations of ground and auxiliary control in strip and block adjustments are obtained from practical experiments.

Titel:/Title:/Titre:

ERROR AND ACCURACY ANALYSIS IN
APPLICATION OF PHOTODRAMMETRIC METHODS
TO LAND SURVEYS

Autor(en)/Author(s)/Auteur(s): SHUH-CHAI LEE, P.S., P.E., Ph.D.
Aerial Engineering Section
Ohio Department of Transportation

Zusammenfassung:/Abstract:/Sommaire:

Broadly speaking, land surveys should included not only the position of boundary corners (points) and the area enclosed by the boundaries, but also the inventory of the land resources and its uses. Therefore, remote sensing may also be included in the discussion of photogrammetric methods. However, due to limitations of the application of remote sensing method to the rather refined numerical requirements of the traditional land surveys or cadastral surveys, this paper will emphasize the discussion to the traditional cadastral surveys. The numerical analysis of the errors and accuracy of the photogrammetric methods will consist the examination of original photographic scales and produced map scales, the capability of various analogical and digital, or graphical and analytical instruments, and the geometrical variations of the distance, coordinate and areal values as against the commonly used methods in old land surveys and ground surveys.

Titel:/Title:/Titre:

TECHNIQUES FOR DIGITAL IMAGE RECORDING IN PHOTOGRAMETRY

Autor(en)/Author(s)/Auteur(s):

MARK T. MASON

Zusammenfassung:/Abstract:/Sommaire:

RECENT TRENDS IN DIGITAL IMAGE PROCESSING HAVE SHOWN A NEED FOR IMAGE RECORDING EQUIPMENT THAT SIGNIFICANTLY REDUCES SYSTEM THROUGHPUT TIME WHILE MAINTAINING RECORDING PRECISION AND IMAGE FIDELITY.

THIS PAPER WILL EXAMINE PROBLEMS ENCOUNTERED IN HIGH-SPEED PRECISION IMAGE RECORDING ON BOTH BLACK AND WHITE AND COLOR FILM, AND TECHNIQUES THAT CAN BE USED TO OVERCOME THESE PROBLEMS.

TOPICS COVERED WILL BE MECHANICAL EQUIPMENT, OPTICAL TECHNIQUES, APERTURE FUNCTIONS, LASER WRITING, DATA INTERFACES, DATA COMPRESSION AND MANIPULATION TECHNIQUES.

Titel:/Title:/Titre:

Error Analysis of Elevation Profiles From Digital Images

Autor(en)/Author(s)/Auteur(s):

E.M. Mikhail

Zusammenfassung:/Abstract:/Sommaire:

During photogrammetric profiling on analytical plotters, the x-parallax must be removed dynamically. Factors that affect this operation include plotter characteristics, human performance, image parameters, and the terrain attributes. The combined effect of these factors appears as profile error. With simulated digital photographs, where image and object space coordinates are precisely known, this error can be evaluated. An attempt is made to resolve profile error into its different components. Some preliminary results are shown.

Titel:/Title:/Titre:

Mensuration Tests Using Digital Images

Autor(en)/Author(s)/Auteur(s):

E.M. Mikhail

Zusammenfassung:/Abstract:/Sommaire:

Digital image files were written on photographic film using 25, 50, and 100 micrometer pixels. The resulting images were then measured monoscopically and stereoscopically. Measurement precisions associated with images having 25 and 50 micrometer pixel sizes were comparable. 100 micrometer pixel size had an adverse effect on measurement precision.

Titel/Title/Titre

On the evaluation of ground control data.

Autor(en)/Author(s)/Auteur(s)

M. Molenaar en T. Bouw

Zusammenfassung/Abstract/Sommaire:

The regular structure of aerotriangulation blocks simplifies the study of reliability and precision of photogrammetric point determination. As geodetic networks do not always have such a regular structure, tools should be available to check their quality. At ITC a set of programmes has been developed to analyse such networks and to adjust them. These programmes can be used by people working in practise, as well as by students who want to learn what are the limits for precision and reliability for ground control.

Titel/Title/Titre: An Information Manipulation System for
Digital Elevation Data

Autor(en)/Author(s)/Auteur(s): D.K. Rose

Zusammenfassung/Abstract/Sommaire:

A system is described for the restructuring of Digital Elevation data into various forms in order to meet the general requirements of Digital Elevation data users in a wide variety of disciplines. Input to the system is digital elevations in either regular grid or irregular (contour) formats. At present the system output can be any combination of the following: digital elevations (in either regular or irregular format to user defined specifications); slope information; terrain shapes; terrain parameters; mathematical surface functions. The output is stored on a Direct Access file thereby allowing subsequent manipulation of the reduced data. Sequential output from this file can be directly utilized by the user. Several examples are given for the use of the reduced data for terrain analysis, and slope mapping. The Software System is modular and is written in FORTRAN IV.

Titel:/Title:/Titre: Tischrechner-Unterstützung von Monokomparator- und Stereoauswertegerät

Autor(en)/Author(s)/Auteur(s): Dr.-Ing. Eberhard Seeger

Zusammenfassung:/Abstract:/Sommaire:

Bei Monokomparator-Messungen durch Punktverwechslungen u. a. auftretende Fehler können durch on line-Rechnerunterstützung bereits beim Messvorgang eliminiert werden. Das für den Tischrechner HP 9825, 9835 und 9845 (mit Monokomparator ZEISS PK-1/ECOMAT-12) erstellte Programm CAMOC (Computer Assisted Monocomparator Measurements) erlaubt die on line-Berechnung der inneren und relativen Orientierung, sowie Fehlerbereinigung und Ausgabe von geprüften Bild- oder Modellkoordinaten für die Blockausgleichung. Die Stereoauswertung am Analoggerät (z.B. ZEISS-PLANIMAT, PLANICART, PLANITOP) kann ebenfalls durch Tischrechner unterstützt werden. Für HP 9825, 9835 und 9845 (mit ECOMAT-12, DIREC-1) steht das Programmsystem CASP (Computer Assisted Stereo Plotting) zur Verfügung. Ausgehend von der relativen Orientierung wird mit Hilfe von gemessenen Paßpunkten die absolute Orientierung durchgeführt. Es können direkt Landeskoordinaten ausgegeben oder Einstellwerte am Auswertegerät abgeleitet werden. Das Programm erlaubt interaktive Fehlerbereinigung und dynamische Punktregistrierung nach Intervallen. Es werden Beispiele für den Ablauf der Programme gegeben und ein Zeitvergleich durchgeführt.

Titel:/Title:/Titre: Vereinfachte Datenverarbeitungsverfahren zur Auswertung multispektraler Satellitenbilder

Autor(en)/Author(s)/Auteur(s): R. Scholz

Zusammenfassung:/Abstract:/Sommaire:

Da in der Auswertep Praxis von Landsat-MSS-Daten die Beziehung zwischen multispektralem Reflexionsverhalten und geowissenschaftlichen Einheiten in den meisten Fällen relativ unscharf ist, können zur Klassifizierung vereinfachte, zeitsparende Rechenverfahren angewendet werden.

Titel:/Title:/Titre: "On-line Applications of an Analytical Plotter for Densification of Geodetic Control".

Autor(en)/Author(s)/Auteur(s): Chester C Slama

Zusammenfassung:/Abstract:/Sommaire: The National Ocean Survey has developed a highly precise application of analytical photogrammetry to densify geodetic nets. The system uses pre-marked ground targets with a reseau camera and presently is restricted to certain configurations of ground points to maintain optimum geometry for the photogrammetric solution. This paper discussed an application of the analytical plotter which will eliminate this restriction. Model pairs from the photography are "relatively oriented" in the analytical plotter in addition to the measurement on a monoscopic comparator of the targetted points. The exterior orientation parameters from the relative orientation are then used as constraints for the adjustment of the targetted points. This method will reduce field costs for targetting points needed for photogrammetric geometry only. In addition, the method should increase the final accuracy through the use of optimum geometry used in the relative orientation.

Titel:/Title:/Titre: Research on aerial triangulation in Commission A of OEEPE.

Autor(en)/Author(s)/Auteur(s): Jüri J Talts

Zusammenfassung:/Abstract:/Sommaire:

Commission A of OEEPE, which works with aerial triangulation, has recently started two research projects. One is dealing with the accuracy of point transfer and projection centers. The other is studying the effect of auxilliary geodetic measurements on photogrammetric block adjustments. The paper will give an overview of present activities within the Commission.

Titel:/Title:/Titre:

Spectral Analysis of Terrain Relief for the Accuracy Estimation of DTM's.

Autor(en)/Author(s)/Auteur(s):

K. Tempfli

Zusammenfassung:/Abstract:/Sommaire:

The accuracy of representation of a topographic surface by a DTM depends on the density of sampling related to the roughness of the surface, the measuring precision, and the interpolation procedure employed for its reconstruction. The transfer function of sampling and interpolation provides an excellent means for studying different interpolation methods and the influence of sampling density. Making use of the concept of the transfer function, and the spectra which describe the terrain relief and the measuring error, makes it possible to express the performance of the DTM in terms of accuracy. A few typical terrain types are selected. They are represented graphically by contour plots and characterised by their respective spectra. The dependence of the mean square error of reconstruction on the sampling density is illustrated for several interpolation methods. A classification of terrain relief based on its spectrum could solve the problem of choosing the appropriate sampling density to meet given accuracy specifications.

Titel:/Title:/Titre: THE SYSTEM OF MODELS FOR OPTIMIZATION AND
ESTIMATION ON PHOTOGRAMMETRIC NETWORKS

Autor(en)/Author(s)/Auteur(s): Vainauskas V.

Zusammenfassung:/Abstract:/Sommaire: To improve the quality of designing a unique system of models for optimization of photogrammetric measurement information is proposed. It allows by using pocket calculators according to rather simple and uniform algorithms to analyse deformations of any nets and to make solution for the displacement of defects in time. The results of estimation are identic to the data received by variance-covariance and stochastic-statistic methods because the repeated studies and comparisons of standart errors of coordinates of points calculated at different variants of establishment, processing and estimation of the nets have shown good coincidence.

Titel:/Title:/Titre:

Large Block Adjustment Projects in Photographic Astrometry

Autor(en)/Author(s)/Auteur(s):

Ch. de Vegt, Hamburg
H. Ebner, Munich

Zusammenfassung:/Abstract:/Sommaire:

As a result of long term collaboration between astrometry and photogrammetry a program package for the rigorous least squares adjustment of thousands of photographic plates was developed at Hamburg Observatory and successfully applied to the material of the AGK 2 and AGK 3 catalogues, both covering whole the northern hemisphere. The resulting simultaneous adjustments required the computation of about 16 000 unknown plate parameters and about 360 000 unknown star coordinates.

Titel:/Title:/Titre: EFFEKTIVITÄT DER KALIBRIERUNG VON AEROPHOTOGRAPHISCHEN SYSTEMEN

Autor(en)/Author(s)/Auteur(s): Wassiljew L.

Zusammenfassung:/Abstract:/Sommaire: Durch Kalibrierung von aerophotographischem System unter Verwendung eines Prüffeldes wird ein Vektorfeld $\bar{v}(x,y)$ bestimmt. Die Effektivität der Anwendung dieses Vektorfeldes kann mit Hilfe der Theorie der zufälligen Prozesse untersucht werden. Es handelt sich um das zufällige Vektorfeld. Bei der Untersuchung der Messergebnisse wurden Wahrscheinlichkeits-, Korrelationsfunktionen und Spektraldichte berechnet. Die Zeitabhängige Veränderlichkeit wurde mit Hilfe der Vektorfelder untersucht. Die Werteverteilung gestattet eine Annahme der Gamma - Verteilung. Bei der Aero-triangulation unter Berücksichtigung der Kalibrierungswerte wurden mittlere Fehler bis zweimal reduziert.