REPORT OF ITALIAN ACTIVITIES FOR ISPRS COMMISSION III

Gianfranco Forlani
Politecnico di Milano
DIIAR - Sezione di Rilevamento
Piazza Leonardo da Vinci 32
20133 Milano - ITALY

Commission VI

ABSTRACT:

Italian contributions to research on subjects covered by ISPRS Commission III have been provided both by traditional photogrammetrists and relative newcomers, like experts in electronics and computer vision. The research group of photogrammetrists most involved in Commission III activities is that of the Politecnico di Milano.

1. INTRODUCTION

This paper tries to give an overview of Italian activities in the period 1988-1992 for the field covered by ISPRS Commission III. At the end of the article, a list is given of publications, prepared at Italian research establishments, for the mentioned field and mentioned time period. In order to restrict the list to publications of possible interest to the international community, papers written in Italian are excluded.

The preparation of this report is a difficult task, because the number of active research groups is very large. They are mostly small and scattered along different departments and institutes of different research establishments. Besides, a significant number papers are published outside the traditional photogrammetric information channels. The list can therefore only be indicative.

2. RESEARCH OF TRADITIONAL PHOTOGRAMMETRISTS

The traditional photogrammetric experts are organized in the SIFET, the Italian national organisation for photogrammetry and surveying (Società Italiana di Fotogrammetria e Topografia). Its task is to give a contribution to the study of and research in photogrammetry and surveying. It resides at the same adress as the author. The SIFET publishes a trimestral bulletin with papers of national interest written in Italian and organises an annual congress. The most active members of the SIFET are the Institutes for Surveying and Photogrammetry of the various Universities. However, the majority of efforts are directed towards application based activities. In the period of 1988 - 1992 areas of special interest were support of GPS to photogrammetry, digital image processing for industrial and architectural photogrammetry and creation of a GIS by digitizing maps.

Unfortunately research in the field covered by Commission III is limited. Traditionally, the research group most interested in Commission III activities is that of the Politecnico di Milano; with this group collaborate a number of researchers in other establishments. In addition to traditional fields like block adjustments and surface reconstruction new topics were studied, like aerotriangulation with SPOT imagery and automated DEM production from digital images. At the moment, research on digital image processing algorithms is shifting from small scale SPOT imagery to the larger scale imagery of close range photogrammetry. Topics of interest and of probable future research are the combination of aerotriangulation and aircraft trajectory reconstruction with GPS data, and GIS data structures.

Besides the SIFET, a second organisation in the field is the AIT (Associazione Italiana del Telerilevamento), which is active in the field of remote sensing (Commission VII).

3. RESEARCH OF OTHERS

With the traditional photogrammetric experts involved primarily with direct applications, the sector of data analysis and mathematical modelling is to some extent neglected. This provides an opportunity for newcomers like experts in electronics and computer vision. In fact, from these fields, significant contributions have been made. Areas of special interest were processing of satellite imagery and computer vision.

4. CONGRESSES

At Centre for International Mechanic Studies in Udine, each year an advanced school is held with renowned international speakers on topics regarding surveying and photogrammetry. The topics in the year between 1988 and

1992 were respectively deformation analysis, digital photogrammetry, geodetic and photogrammetric applications of the Global Positioning System (GPS) and geographic information systems (GIS).

Two of the four tutorials of the ISPRS intercommission III/VI working group Mathematical aspects of data analysis were held in Italy. The first tutorial was held in 1989 in Pisa on occassion of the 25th anniversary of the death of prof. Gino Cassinis, the third in 1991 in Milan on occasion of the 70th anniversary of prof. Mariano Cunietti. The first has been the president of ISPRS Commission III in the period 1956-1960, the second has been the secretary of the same Commission for the mentioned period.

5. REFERENCES

Barzaghi, R., Crippa, B., 1990. 3-D collocation filtering. IAPRS Vol. 28 part 5/2 pp. 886-893.

Benciolini, B., 1990. The observation equations of digital photogrammetry. Proceedings of 2nd ISPRS Intercommission Working Group III/VI Tutorial Mathematic apects of data analysis, held on Rodos, September 1990. DIIAR - Politecnico di Milano.

Cafforio, C., Prati, C., Rocca, F., 1991. Full resolution focussing of Seasat SAR images in the frequency-wave number domain. International Journal of Remote Sensing, vol. 12, no. 3, pp. 491-510.

Capellini, V., Alparone, L., Galli, G., Langé, P., Mecocci, L., Capanni, G., Carlà, R., 1991. Digital processing of stereo images and 3-D reconstruction techniques. International Journal of Remote Sensing, vol. 12, no. 12.

Capellini, V. 1992. Multispectral intelligent fusion techniques. Proceedings of the International Space Year Conference, held in Munich 30-3-1992 - 4-4-1992. ESA publication.

Crespi, M., Crippa, B., Mussio, L., 1989. An algorithm for an approximate inverse of large sparse matrices.Proceedings of 1st ISPRS Intercommission Working Group III/VI Tutorial Mathematic apects of data analysis, held in Pisa (Italy), June 1989. DIIAR - Politecnico di Milano. ˙

Crippa, B., de Haan, A., Mussio L., 1989. The formal structure of geodetic and photogrammetric observations. Proceedings of 1st ISPRS Intercommission Working Group III/VI Tutorial Mathematic apects of data analysis, held in Pisa (Italy), June 1989. DIIAR - Politecnico di Milano.

Crosilla, F., Russo, T., 1988. Fulfilment of a criterion matrix for a photogrammetric block triangulation by a second order design of a control network. Manuscripta Geodaetica, vol. 13, no. 6, pp. 323-336.

Crosilla, F., Russo, T., 1989. About the irrelevance of the datum choice when searching for meaningful deformations.

Publication of the Istituto di Scienze della Terra, Udine, Italy.

Crosilla, F., Russo, T., Schaffrin B., 1989. Improved second order design and datum choice. Bulletin Geodésique no. 63, pp. 191-202.

Crosilla, F., Russo, T., 1990. Optimal design of experiments. Proceedings of 2nd ISPRS Intercommission Working Group III/VI Tutorial Mathematic apects of data analysis, held on Rodos, September 1990. DIIAR - Politecnico di Milano.

Crosilla, F., Piccinini, L.C., 1991. A new approach for pattern recognition in cadastral cartography. Geo-Information Systems, vol. 4, no. 4, pp. 14-20.

Fangi, G., 1990. The direct linear transformation with the camera station points. Proceedings of 2nd ISPRS Intercommission Working Group III/VI Tutorial Mathematic apects of data analysis, held on Rodos, September 1990. DIIAR - Politecnico di Milano.

Fritsch, D., Crosilla F., 1990. First order design strategies for industrial photogrammetry. IAPRS Vol. 28 part 5/1 pp. 432-438.

Gatti, M., Olivieri, P., Straforini, M., Torre, V., 1992. Robust recovery of the 3D recovery of outdoor scenes. In: Forstner W., Ruwiedel, S., (Eds). Robust computer vision, quality of vision algorithms. Wichmann Verlag, Karlsruhe.

de Haan, A., Togliatti, G. 1990. Bundle adjustments with SPOT data at the 'Politecnico di Milano'. In: Festschrift Gottfried Konecny zum 60. Geburtstag, pp. 131-140. Institut für Photogrammetrie und Ingenieurvermessung, Universität Hannover, Heft 13. Hannover, June 1990.

de Haan, A., 1991. A mathematical model for bundle adjustments with SPOT data. In: Bollettino di Geodesia e Scienze Affini, anno L-n.4, October-November-December 1991. Istituto Geografico Militare, Firenze.

de Haan, A., 1992. Contribution of the 'Politecnico di Milano' to the OEEPE test on triangulation with SPOT data. In I.J. Dowman (Ed.): OEEPE test of triangulation of SPOT data. Publication of the OEEPE, 1992.

de Haan, A., 1992. Fundamentals of cluster analysis. In: Proceedings of the ISPRS Intercommission Working Group III/VI Tutorial on Mathematical Aspects of Data Analysis, held in Milan, 7 May 1991. Politecnico di Milano - DIIAR.

Malisia, A., Campani, M., Verri, A., 1992. A simple and robust method for estimating the motion of a mobile vehicle from optical flow. In: Forstner W., Ruwiedel, S., (Eds). Robust computer vision, quality of vision algorithms. Wichmann Verlag, Karlsruhe.

Parodi, G., Zunino, R. 1990. Noise insensitivity of an associative image classification scheme. Proceedings of the first ISPRS/IEEE international workshop on Robust Computer Vision. University of Washington, Seattle.

Parodi, G., Zunino, R., 1992. Robust associative image classification. In: Forstner W., Ruwiedel, S., (Eds). Robust computer vision, quality of vision algorithms. Wichmann Verlag, Karlsruhe.

Prati, C., Rocca, F. 1990. Limits to the resolution of elevation maps from stereo SAR images. International Journal of Remote Sensing, vol. 11, no. 12, pp. 2215-2235.

Rocca, F., Prati, C., 1992. Innovative applications of repeated satellite SAR surveys. Proceedings of the International Space Year Conference, held in Munich 30-3-1992 - 4-4-1992. ESA publication.

Sacerdote, F., Sansò, F., 1992. On a rigorous continuous model for digital photogrammetry. In: Proceedings of the ISPRS Intercommission Working Group III/VI Tutorial on Mathematical Aspects of Data Analysis, held in Milan, 7 May 1991. Politecnico di Milano - DIIAR.

Sandini, G., Tistarelli, M., 1990. Robust obstacle detection using optical flow. Proceedings of the first ISPRS/IEEE international workshop on Robust Computer Vision. University of Washington, Seattle.

Straforini, M., Coelho, C., Campani, M., Torre, V. 1990. Using geometrical rules and a priori knowledge for the understanding of indoor scenes. Proceedings of the first ISPRS/IEEE international workshop on Robust Computer Vision. University of Washington, Seattle.