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Front Matter: Volume 1395

, "Front Matter: Volume 1395," Proc. SPIE 1395, Close-Range
Photogrammetry Meets Machine Vision, 13954F (1 August 1990); doi:
10.1117/12.2294402

SPIE.

Event: Close-Range Photogrammetry Meets Machine Vision, 1990, Zurich,
Switzerland

CLOSE-RANGE PHOTOGRAMMETRY
MEETS MACHINE VISION

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Vol. 1395, 13954F · © (1990) 2012 SPIE · CCC code: 0277-786X/12/\$18 · doi: 10.1117/12.2294402

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INTRODUCTION

This symposium was organised by Commission V "Close-Range Photogrammetry and Machine Vision" of the International Society for Photogrammetry and Remote Sensing (ISPRS) and by the Institute of Geodesy and Photogrammetry, Swiss Federal Institute of Technology (ETH) Zurich. The aim is to bring together experts from various disciplines who are concerned with the design, development, and application of modern analogue, digital, and hybrid vision systems that operate in a close-range environment. The conference is designed for scientists, engineers, and users from universities, research institutes, industry, governmental organisations, and engineering firms in the fields of photogrammetry, machine vision, and robot vision.

In recent years the modern vision disciplines of computer vision, machine vision, and robot vision have found widespread interest in the scientific and engineering world. The further development of these disciplines is crucial for advancements in various other fields of science, technology, and industry. As the scientific and engineering concepts of vision systems are increasingly being examined in practical application environments, the need for precise, reliable, and robust performance with respect to quantitative measurements becomes obvious. Quantitative measurement, on the other hand, has been a familiar domain to photogrammetrists for many years. The intention of this symposium is to combine the longstanding, application-proven expertise of classical photogrammetric procedures with up-to-date, forward-looking vision hardware and algorithmic concepts in order to overcome current limitations and to arrive at truly efficient and reliable systems that will open up new and promising fields of application.

The topics relate, but are not restricted to, the terms of reference of the Working Groups of ISPRS Commission V:

WG V/1: Digital and Real-time Close-Range Photogrammetric Systems

- Real-time vision systems for metric measurements
- System hardware and software integration
- Demonstration of systems in actual application environments

WG V/2: Close-Range Imaging Systems—Calibration and Performance

- Geometric and radiometric characteristics of CCD and hybrid imaging systems
- Procedures and strategies for calibration and orientation
- High-precision photogrammetry ($<10^{-5}$) with large-format photographic images and CCD matrix sensors in image space

WG V/3: Image Analysis and Image Synthesis in Close-Range Photogrammetry

- Algorithmic aspects in image analysis
- Visualisation techniques in image synthesis
- Hardware architecture for real-time image analysis and image synthesis

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WG V/4: Structural and Industrial Measurements with Consideration of CAD/CAM Aspects

- Integration of CAD/CAM into the photogrammetric measurement process
- Digital photogrammetric systems for industrial mensuration
- Transfer of photogrammetric technology to the industrial design, engineering, and manufacturing sector

WG V/5: Photogrammetry in Architecture and Archaeology

- Application of new photogrammetric technology to architectural and archaeological surveying and recording
- Possibilities offered by new low-cost photogrammetric systems and video-based systems
- Study of appropriate applications of CAD/CAM and LIS/GIS

WG V/6: Biostereometrics and Medical Imaging

- Human motion analysis and biological surface measurements
- 3-D medical imaging and anthropometry; 3-D microscopy
- Hardware and software for use in medical imaging

Associate Group: Robot Vision

- Recent developments
- Applications

A total of 189 Technical Papers were accepted for presentation at the symposium. One hundred fifty-four Technical Papers and three Working Group reports are collected in these proceedings. For the first time in ISPRS Commission V Symposium history, the large number and high quality of the papers made it necessary to organise two technical sessions in parallel. One hundred eighteen papers are presented in these sessions, while seventy-one are given at poster sessions. This clearly indicates the great interest that the scientific and technical topics of Commission V generate in the photogrammetric and machine vision communities and other related disciplines.

We expect that this symposium will provide a stage for the exchange of ideas and experiences that will further advance the vision-based close-range measurement techniques. It is our hope that all participants will leave Zurich with the recollection of a most rewarding conference, with respect to both the scientific and the social program.

Armin Gruen

President of ISPRS Commission V
Symposium Director
Editor Symposium Proceedings

Horst A. Beyer

Secretary of ISPRS Commission V
Symposium Secretary

Emmanuel P. Baltsavias

Coeditor Symposium Proceedings

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