

51. Photogrammetric Week ...



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A Cordially Welcome ...

51. Photogrammetric Week – The World Artistic Gymnastics Championships 2007



40th EnBW World Artistic Gymnastics
Championships 2007
Stuttgart
1.- 9. September

Universität Stuttgart

EnBW TURN-WM
STUTTGART 2007

EnBW
40th EnBW World Artistic Gymnastics
Championships 2007 Stuttgart

- **Schlossplatz** Medal Placa & Stage at
- show & live music program, i.e.
 - SWR3 DanceNight – Tuesday, 7.30 pm
 - The Rattles – Wednesday, 8.00 pm
 - SWR1 Band – Thursday, 8.00 pm

51. Photogrammetric Week - The Stuttgart Weindorf



Sun-Wed 11-23 h
Thu+Fri+Sat 11-24 h

Photogrammetric Week Series - As everthing began ...



Oct. 04 – 10, 1909
1st Vacation Course
in Stereo Photogrammetry

C. Pulfrich.

Dr. Carl Pulfrich, Father of Stereo Photogrammetry

51. Photogrammetric Week

Thanks to the Open Phowo Partners:

BAE SYSTEMS



51. Photogrammetric Week

Opening Session – Thank you!



- Prof. Dr. Wolfgang Osten, Vice President Research, Universität Stuttgart
- Major Dirk Thürnau, City Council Stuttgart
- Prof. Dr. Orhan Altan, Secretary General ISPRS

Keynote Prof. Dr. Thomas Ertl, Visualization Institute Univ.
Stuttgart

Towards Gigapixel Displays for Data Visualization



51. Photogrammetric Week

Dieter Fritsch (Ed.)

Photogrammetric Week '07



Wichmann

Thanks go also to:

- Martina Kroma, Markus Englich, Werner Schneider
- Wichmann Verlag, Heidelberg

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 **ifp** Universität Stuttgart
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Institut für Photogrammetrie
Photogrammetrische Wochen
- Photogr. Wochen

- Photogrammetrische Woche 1975
- Photogrammetrische Woche 1977
- Photogrammetrische Woche 1979
- Photogrammetrische Woche 1981
- Photogrammetrische Woche 1983
- Photogrammetrische Woche 1985
- Photogrammetrische Woche 1987
- Photogrammetrische Woche 1989
- Photogrammetrische Woche 1991
- Photogrammetrische Woche 1993
- Photogrammetrische Woche 1995
- Photogrammetrische Woche 1997
- Photogrammetrische Woche 1999
- Photogrammetrische Woche 2001
- Photogrammetrische Woche 2003
- Photogrammetrische Woche 2005
- Photogrammetrische Woche 2007

Letzte Änderung 23.08.2007 ([wm](#)) | © Universität Stuttgart | Impressum

51. Photogrammetric Week – 1st topic: Strength and Weakness Digital Image Data Collection



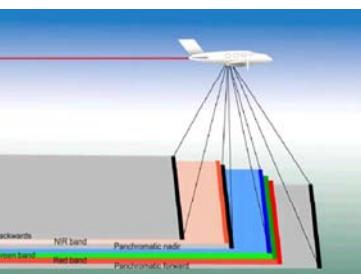
ADS40 – Leica



DMC – Intergraph/ZI-Imaging



UltraCam_D – Vexcel



Airborne Data Acquisition SS07 Fritsch/Cramer (ifp)



Airborne Camera Systems

Photogrammetric world is fully digital today

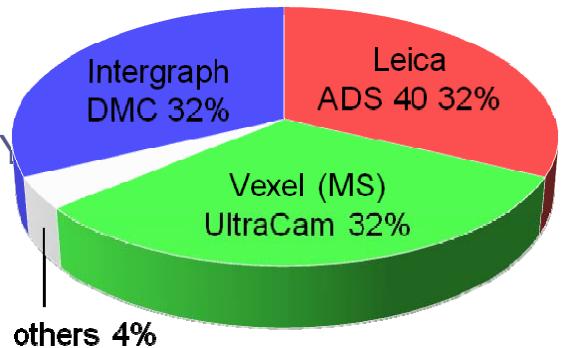
a) film-based (RMK, RC 30, ...)

- 50 systems sold per year
- experiences from 1980s, 1990s



b) digital systems

- introduction to market 2002
- about 200 systems sold so far (in 5 years)
- 40 systems sold per year



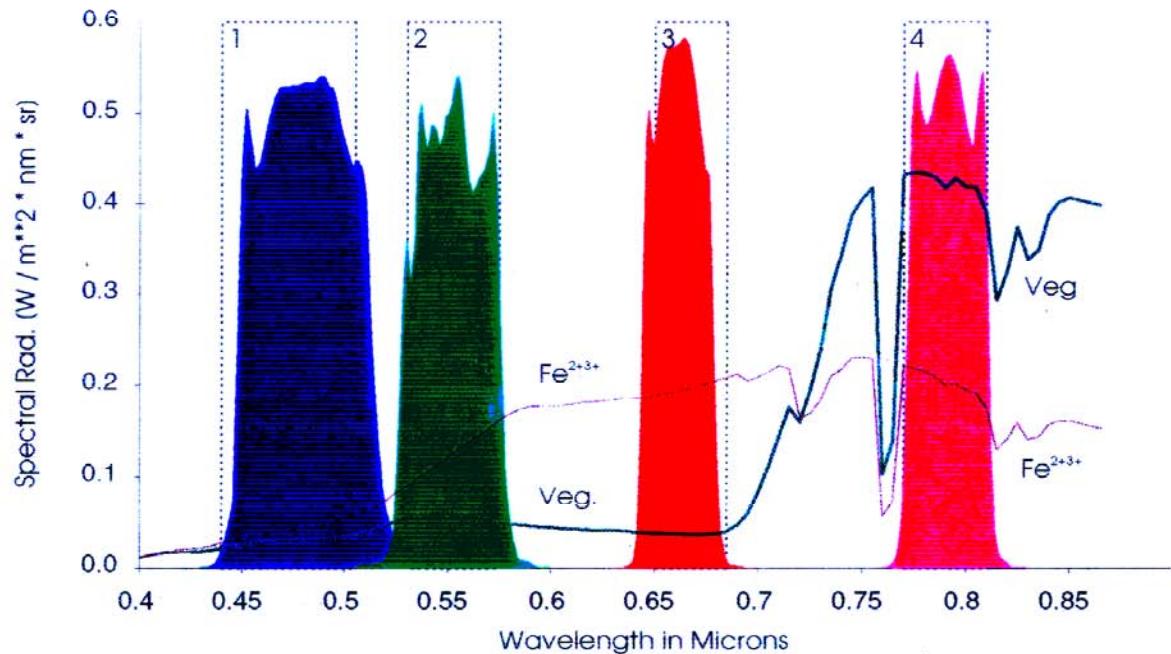
51. Photogrammetric Week - Digital mapping cameras

Photogrammetric world is fully digital today

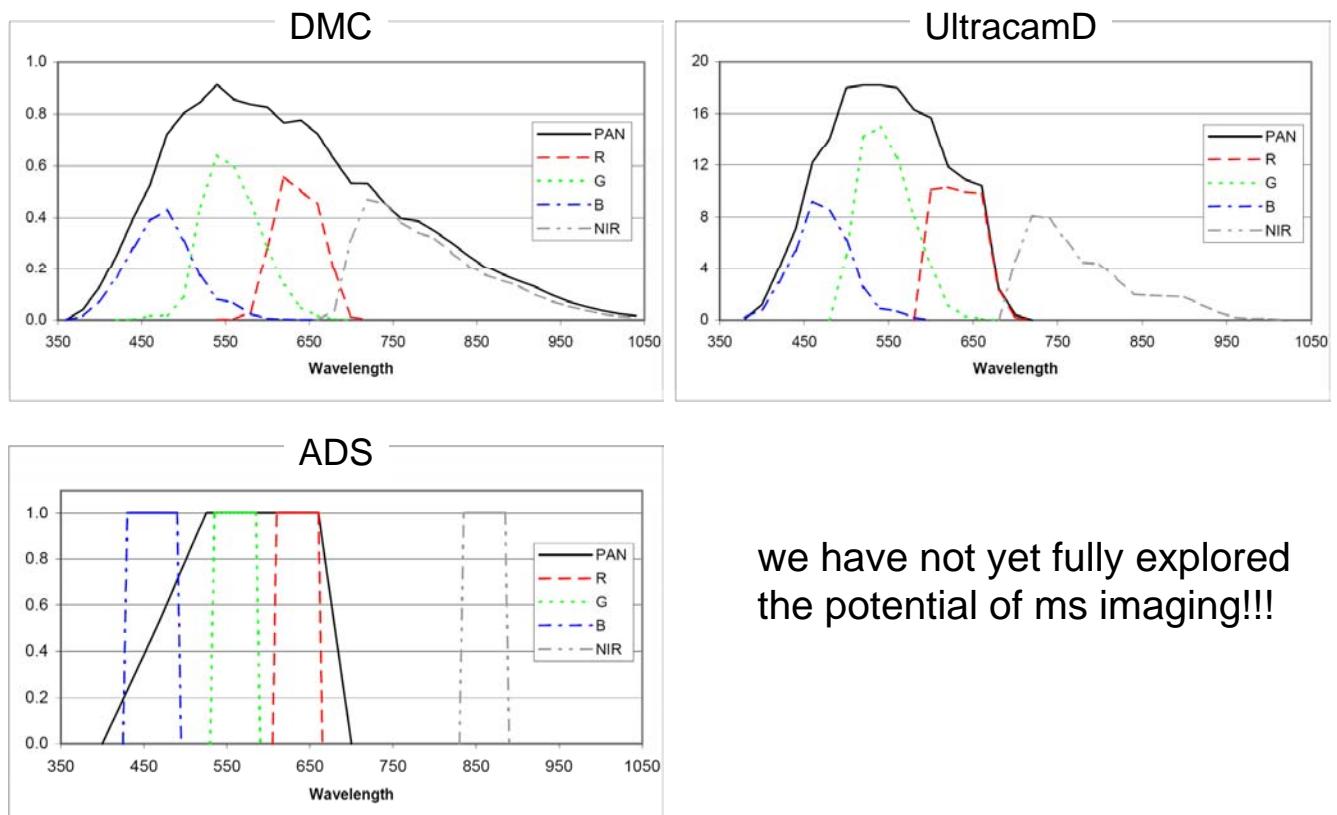
#	Sensor	Geometry		Camera heads		Image formats		Recording principle	
		1D	2D	1	>1	groß	mittel	synchr.	syn-top.
1	ADS 40	X			X		X		X
2	DMC		X			X			
3	UltraCam								X
4							X	X	
5		X			X		X		X
6	DIMAC		X	X	X			X	X
7	JAS-150	X		X		X		X	

The photogrammetric world is fully digital today ...
but also much more heterogenous and maybe more complex

51. Photogrammetric Week - MS Channel Design Experiences from Remote Sensing



51. Photogrammetric Week – Spectral bands of digital airborne cameras



51. Photogrammetric Week – 2nd Topic

Geocoding of Photogrammetric Imagery

Modified collinearity equations

$$\vec{X} = \vec{X}_o^{GPS} + \mathbf{R}[\lambda \cdot \mathbf{M}\vec{p} + \Delta\vec{X}_{cam} - \Delta\vec{X}_{GPS}]$$

\vec{X} object point vector

\vec{X}_o^{GPS} GPS position

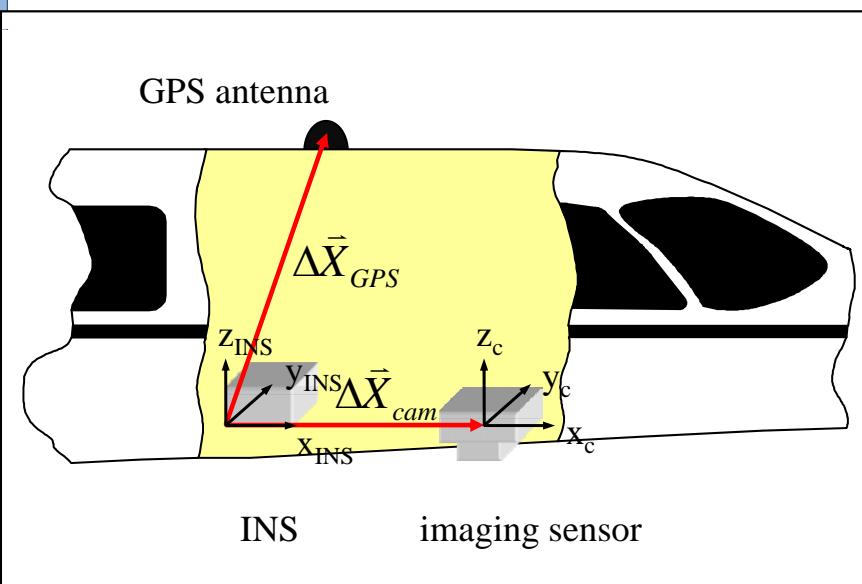
\mathbf{R} rotation from INS to object coord. system

\mathbf{M} rotation from image coord. system to INS

\vec{p} image vector

$\Delta\vec{X}_{cam}$ offset from INS to imaging sensor

$\Delta\vec{X}_{GPS}$ offset from INS to GPS



51. Photogrammetric Week – 2nd Topic

Workflow combination of INS, GPS and AT

- processing of GPS trajectory
- mechanization of INS data
 - improve INS position and orientation using GPS (e.g. by Kalman Filter)
- AT using tie and control points in forward, nadir and backward image
 - system calibration (boresight alignment)
 - GPS/INS error terms (offset and drift)
 - benefits:
 - handle potential errors of GPS trajectory enlarge distance to reference station
 - improvement of angular accuracy (heading)
 - error analysis for all photogrammetric points
- repeat INS mechanization using additional error and calibration terms from AT

51. Photogrammetric Week – 3rd Topic Photogrammetry Goes Public

- Evolution of the Internet, the Web and Web-based mapping
 - Largest mankind's knowledge depository – Google Books
 - Web 2.0
 - Localized content
 - Easy access to content and services
 - 3D Imagery/Map interfaces: Google Earth, Microsoft Virtual Earth
 - Joining 3D Digital worlds and augmented worlds
- Personal navigation assistance (Google maps, Yahoo maps, Microsoft Maps.Live, TomTom , Garmin, etc.)
- Broadband Internet access (WI-FI, WIMAX)
- Human Computer interaction and user generated content (YouTube - MySpace – Flikr – Digg - Facebook/StudiVZ/Xing)

51. Photogrammetric Week – 3rd Topic Virtual Earth „versus“ Google Earth Stuttgart data

Image contents – satellite & aerial

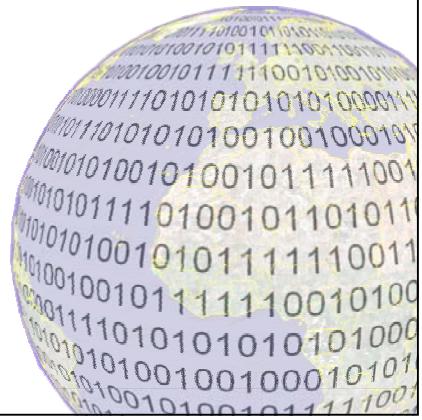


51. Photogrammetric Week Tutorial Towards a 3D Digital Globe - Technologies, Projects and Niches

ifp

**“World Class” Lecture notes (hardcopy,
softcopy) available at the Registration Desk!**

- Eds. D. Fritsch, M. Cramer, N. Haala, M. Kada and V. Walter



51. Photogrammetric Week - Come together in Bad Cannstatt *Kursaal*

ifp



Universität Stuttgart

51. Photogrammetric Week ...



Einladung

51st

Photogrammetric
Week

www.ifp.uni-stuttgart.de/phowo

... is now opened!!!