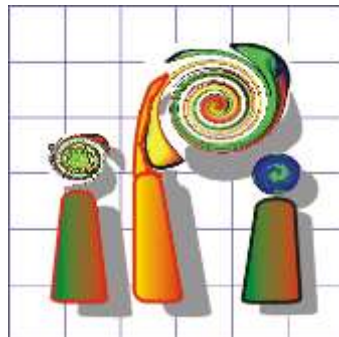


Cooperation between academia and industry in the pursuit of scientific excellence – a German example



Christian Heipke
IPI - Institut for Photogrammetry
and GeoInformation
Leibniz Universität Hannover

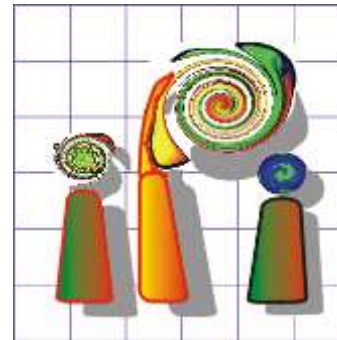


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- **IPI – who we are and what we do**
- **Research strategy and funding**
- **Cooperation with industry**



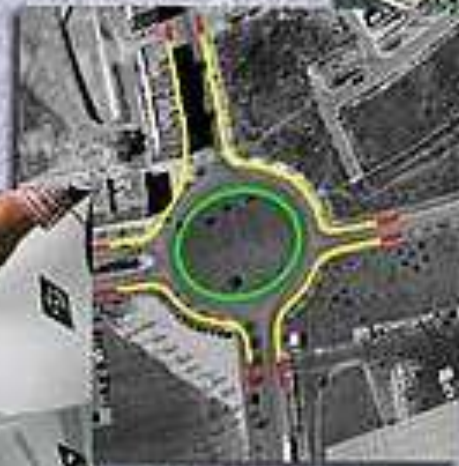
IPI - Who we are and what we do



Hannover



Welcome to the Institute of Photogrammetry and GeoInformation



Nienburger Straße 1
D-30167 Hannover

Tel.: +49 511 762 2482
Fax: +49 511 762 2483

www.ipi.uni-hannover.de

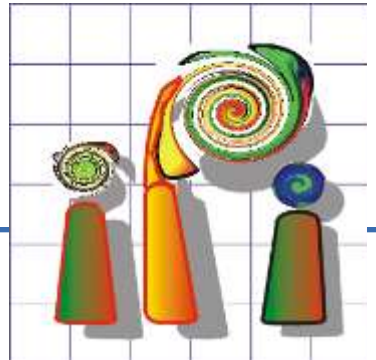
IPI at Leibniz Universität Hannover

- A **university institute** in the faculty of civil engineering and geodetic sciences
- **Research** in Ph & RS and connections to GI and CV
 - A team of approx. 25 scientists, many of them funded externally
- Involved in **university teaching**
 - Geodesy and Geoinformatics
 - Navigation and Field Robotics
- Experience in **industry cooperation**, e.g.
 - Mapping Leica (Zeiss, Intergraph), Vexcel, Rolta, ...
 - RS/Space EFTAS, Airbus (Infoterra), SpaceBel, ...
 - Automotive VW, Porsche, Audi, Daimler, Bosch, iav, ...
 - Ind. Measurement Aicon, GOM, Solving 3D, ...





metrie und GeoInformation



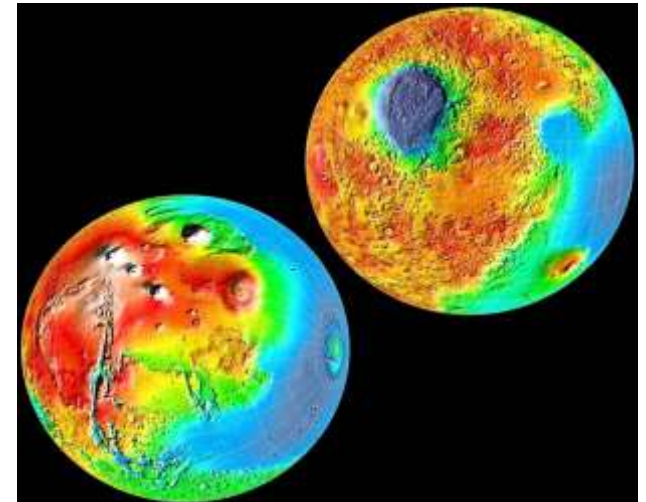
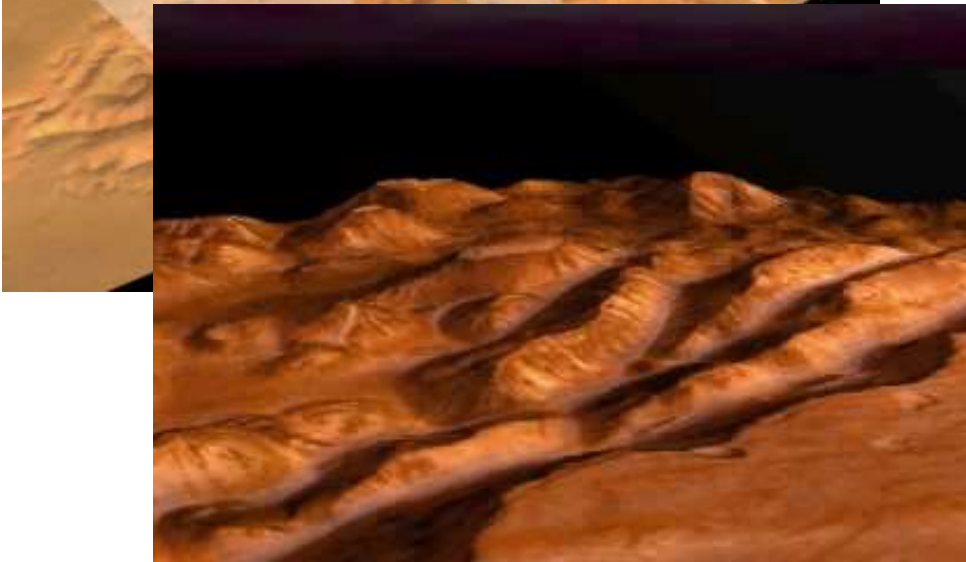
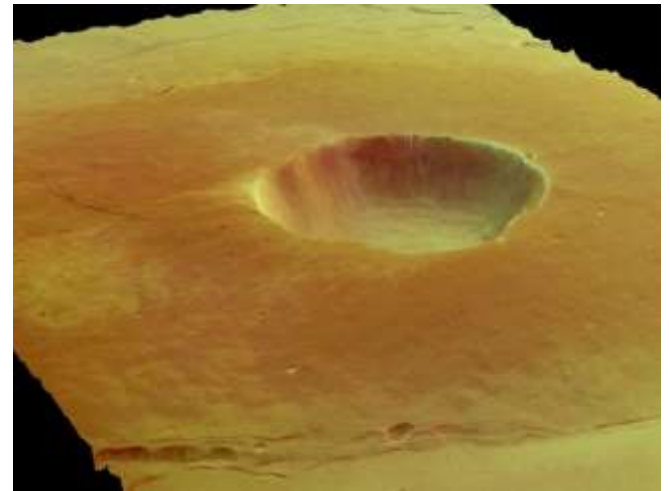
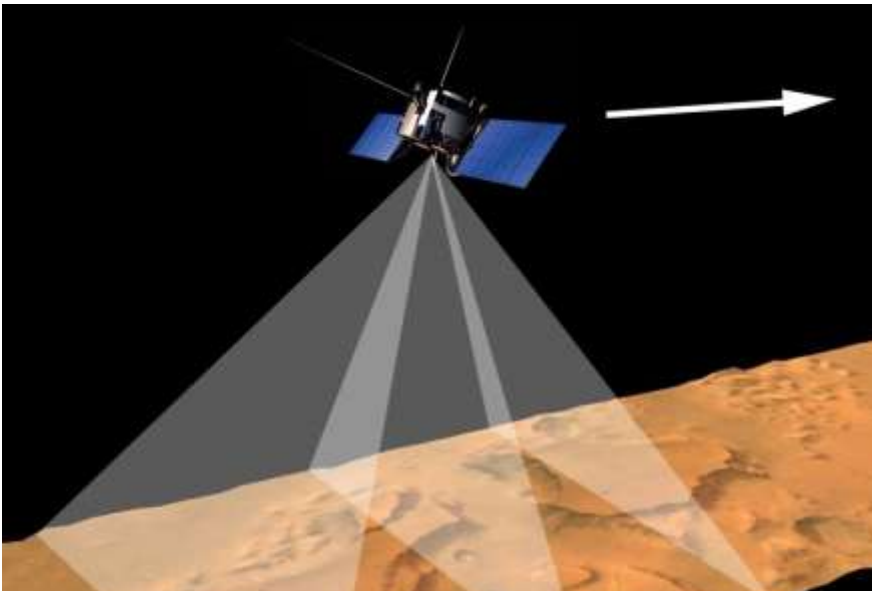
IPI – Research areas

Geometry	Christian Heipke	
Earth observation	Torge Steensen	
Photogrammetric image analysis	Franz Rottensteiner	
Close range	Manfred Wiggenhagen	



Orientation of UAV video sequences





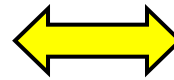
Automatic extraction of urban roads





Quality control and update of GI databases

geospatial data



reality
(orthophoto)



Automatic comparison

A project in cooperation with **BKG**





DeCOVER

Automatic updating of land cover data
for public tasks



Gefördert mit Mitteln des Bundesministeriums für Bildung und Forschung durch das Deutsche Zentrum für Luft- und Raumfahrt e.V. (DLR) unter dem Förderkennzeichen 50 EE 0513

Links Ausschnitt



Links Totale Sicherheit



Links vorne Totale Sicherheit



Vorne oben



Image sequences

1000 images / sec and camera

automatic processing



Rechts Ausschnitt



Rechts hinten Totale Sicherheit



Research strategy and funding



Aims in research and teaching

- new and useful **ideas and concepts** (products, services)
- support of (self-)critical and **independent thinking**
 - state-of-the-art knowledge as pre-requisite
 - new knowledge with as long a half-life as possible
 - openness towards new ideas (curiosity)
 - out-of-the-box thinking
- relevance for **society** (perhaps at long range only ...)
 - includes adequate communication of results
- goal: **relevance** at B.Sc., M.Sc. and PhD level
 - no desire to educate ‘geospatial turks’



Three levels of research

- Basic/fundamental research
 - a playing field to create new and useful ideas and concepts
 - supported by society (national science foundation)
- Applied research & development (e.g. prototype dev.)
 - a test bed of new concepts
 - cooperation between university, government and industry, often supported in part by society (EU, nat. funding, ...)
- Pilot projects (e.g. software dev., empirical studies)
 - direct link between government, industry and academia, often incl. NDA

-> successful research needs all three elements



Third party funding at IPI

- National and international **research organisations**
 - DFG, VW foundation, BMBF, EU, Nds. MWK, KFKI, ...
- **Space Agencies**
 - DLR, ESA, ...
- National **mapping agencies**
 - LGN, LVA SH, BKG, ZGeoBW, BSH, ...
 - IGN France, IGN Brussels, GSI Tokyo, ...
- **Private industry**
 - mapping, remote sensing, space, automobile, industrial measurement, ...



Cooperation with industry



Type of cooperation with industry

- Visits – exchange of ideas
 - invited presentation, round table, ...
- Student exchange
 - guest lectures at university
 - student excursion
 - internships, thesis work (partly carried out in industry)
 - employment options
- Partners in externally funded projects, e.g. EU
- University as contractor of industry
 - funding of PhD students (3 years)
 - pilot project (shorter)
- Consulting

**... in my experience
only 1 external PhD
student in 2
reaches his goal**



Some points for a successful cooperation

- Cooperation on a level playing field – from day 1
 - independence of university is holy grail
 - common selection of staff
 - contracts with different competitors must be possible
- Contract with clear rules (IPR, publications, NDA, ...)
 - university must be allowed publish
 - university defines amount of work necessary for PhD degree
- Clear understanding of terms
 - “research” means that result is unknown, not predictable
- Research needs research environment
 - at least one day per week at university
 - participation in international scientific meetings is a must



Conclusions

- + relevance of research is continually tested
- + access to/common use of expensive tools and data
- + technology transfer „by minds“
- + growing attractiveness of research
- innovative cycles in industry often incompatible with length of PhD thesis
- gap between PhD project result and marketable product/service
- **research and industry are two sides of the same coin, benefitting from a well designed cooperation**
- **academia must be acknowledged as independent actor**

