Institut für Photogrammetrie und Kartographie

2013

Organisationsübersicht und Personal

Institutssprecher:
Studienjahr 2012/2013
    Univ.-Prof. Dr.-Ing. Uwe STILLA
Studienjahr 2013/2014
    Univ.-Prof. Dr.-Ing. Liqiu MENG

Fachgebiet Photogrammetrie und Fernerkundung

Univ.-Prof. Dr.-Ing. Uwe STILLA

Sekretariat:
Christine ELMAUER

Mitarbeiter:
Dipl.-Ing. (FH) Konrad EDER
Dipl.-Inf. Ludwig HOEGNER
M.Sc. Dorota IWASZCZUK
Dipl.-Ing. Oliver MAKSYMIUK
Dipl.-Ing. Michael SCHMITT
M.Sc. Sebastian TUTTAS

Stipendiaten:
M.Sc. Li FANG
M.Sc.Tessio NOVACK

Externe Doktoranden:
Dipl.-Ing. Tobias BECKER
Dipl.-Ing. Carsten GÖTZ
Dipl.-Math. Marcus HEBEL
Dipl.-Inf. Michael JENDRYKE
Dipl.-Ing. Markus KLEINERT
Dipl.-Phys. Thomas KRAUSS
Dipl.-Ing. Stephan PALM
M.Sc. Mattia PEDERGNANA
M.Sc. Przemyslaw POLEWSKI
M.Sc. Boris SELBY
Dipl.-Ing. Sebastian TÜRMER
Dipl.-Inf. Sebastian WUTTKE
B.Eng. Niclas ZELLER

Lehrbeauftragte:
Dr.- Ing. Günther STRUNZ, DLR
(Fach: Angewandte Fernerkundung)
Dr.-Ing. Markus ULRICH, MVTec GmbH
(Fach: Ingenieurphotogrammetrie)

Lehrstuhl für Methodik der Fernerkundung

Univ.-Prof. Dr.-Ing. habil. Richard BAMLER
Sekretariat:
Christine ELMAUER

Mitarbeiter:
Dr.-Ing. Stefan AUER
Dipl.-Ing. Janja AVBELJ
Dipl.-Ing. Florian BURKERT
Dipl.-Ing. Xiaoying CONG
Dipl.-Math. Moritz FISCHER
Dr.-Techn. Friedrich FRAUNDORFER
Dr.-Ing. Stefan GERNHARDT
Dipl.-Ing. Sebastian GIMENO-GARCIA
Dipl.-Phys. Anna GÖRITZ
M.Sc. Mattia PEDERGNANA
M.Sc. Olena SCHÜSSLER
M.Sc. Muhammad SHAHZAD
M.Sc. Yuanyuan WANG
Dipl.-Ing. Nestor YAGUE-MARTINEZ
Dipl.-Inf. Ke ZHU
Dr.-Ing. Xiaoxiang ZHU

Lehrbeauftragte:
Dr. Adrian DOICU
(Fach: Non-linear Optimization)
Prof. Dr.-Ing. Michael EINEDER
(Fach: Fernerkundung und Signalverarbeitung)

Lehrstuhl für Kartographie

Univ. Prof. Dr.-Ing. Liqiu MENG

Sekretariat:
Luise FLEIßNER

Mitarbeiter:
M.Sc. Juliane CRON
Dipl.-Ing. (FH) Theo GEIß
Dr.-Ing. Mathias JAHNKE
Dr. Jukka KRISP
Dr.-Ing. Holger KUMKE
Dipl.-Ing. Christian MURPHY
Dipl.-Ing. Stefan PETERS

Doktoranden und Stipendiaten:
M.Sc. Linfang DING
Dipl.-Inf. Andreas HACKELÖER
M.Sc. Hao LYU
M.Sc. Khatereh POLOUS
M.Eng. Jian YANG
M.Sc. Jiantong ZHANG

Gastwissenschaftler:

M.Sc. Alan Kwok Lun CHEUNG
M.Sc. Yanmin JIN
M.Sc. Lianhuan WEI

Lehrbeauftragte:

Dr. Christian Strobl (Fach: Geostatistik und Geomarketing, DLR)
Prof. William Cartwright (Fach: Cartography, RMIT University, Melbourne)

Fachgebiet Photogrammetrie und Fernerkundung

Forschungsprojekte

- Einsatz von Thermalkameras zur Detektion von Toteis- und Permafrostgebieten (Kooperation mit der Kommission für Glaziologie der Bayerischen Akademie der Wissenschaften und dem Institut für Mathematik und Bauinformatik der Universität der Bundeswehr, München)
- Rekonstruktion urbaner Oberflächenmodelle aus flugzeuggetragenen InSAR-Aufnahmen unterschiedlicher Blickrichtungen (in Kooperation mit Fraunhofer-FHR)
- Fahrzeugdetektion und –verfolgung in Luftbildsequenzen (in Kooperation mit DLR-IMF)
- Fahrzeugdetektion in thermischen IR-Bild-folgen (in Kooperation mit Fraunhofer-IOSB)
- Änderungsdetektion in urbanen Gebieten durch strukturelle Analyse von Multi-Aspekt LiDAR Daten (in Kooperation mit Fraunhofer-IOSB)
- Extraktion urbaner Objekte durch Stereoauswertung hochaufgelöster Satellitenbilddaten (in Kooperation mit DLR-IMF)
- Anreicherung von Gebäudemodellen mit terrestrischen Infrarot-Bildsequenzen (DFG-Projekt in Kooperation mit TUM LFK)
- Automatische Texturierung von 3D Modellen städtischer Quartiere aus Bildsequenzen flugzeuggetragener Wärmebildkameras (in Kooperation mit Fraunhofer-IOSB)
- Objekterkennung durch kombinierte Auswertung von hoch aufgelösten SAR Daten unterschiedlicher Aufnahmerichtung (DFG)
- Entwicklung eines automatisierten Verfahrens zur Baufortschrittskontrolle auf Basis der Integration von Punktwolkeninterpretation und 4D-Bauwerksmodellierung (in Kooperation mit TUM CMS)
- Juneau Icefield Research Program - Untersuchung von Gletscherbewegungen aus TerraSAR-X Daten

Herausgeberschaften

Krisp J, Meng L, Pail R, Stilla U (2013) (eds): Earth Observation of Global Changes (EOGC). Lecture Notes in Geoinformation and Cartography. Springer, ISBN 978-3-642-32713-1

Veröffentlichungen

Avbelj J, Iwaszczuk D, Müller R, Reinartz P, Stilla U (2013): Automatic Line-Based Registration of DSM and Hyperspectral Images. ISPRS Hannover Workshop 2013

Darr T, Goetz C, Tuttas S, Becker T, Stilla U (2013): Fehlerabschätzung zur Positionsbestimmung durch ein Multi-Kamerasystem für die globale Vermessung von Fahrzeugteilen. Oldenburger 3D Tage 2013

Darr T, Goetz C, Tuttas S, Becker T, Stilla U (2013): Genauigkeit der inversen Navigation bei hoher Passpunktsichtbarkeit zur Absolutpositionierung eines geführten Messsystems. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 279-288

Fang L, Maksymiuk O, Schmitt M, Stilla U (2013): Improvement of motion estimation of the Taku Glacier using spaceborne SAR images. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 62-70

Fang L, Maksymiuk O, Schmitt M, Stilla U (2013): Determination of glacier surface area using spaceborne SAR imagery. ISPRS Hannover Workshop 2013

Hanel A, Goetz C, Tuttas S, Becker T, Stilla U (2013): Reduktion der Positionsfehler eines Multi-Kamerasystems durch Schleifenschluss unter beschränkten Sichtbedingungen im teilmontierten Fahrzeugrahmen.Oldenburger 3D Tage 2013

Hanel A, Goetz C, Tuttas S, Becker T, Stilla U (2013): Orientierungsgenauigkeit eines Multi-Kamerasystems bei Roboterbewegungen in einer Fahrzeugkarosserie. In: Seyfert H (Hrsg)

33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 298-307

Hebel M, Stilla U (2013): Automatische Änderungsdetektion beim vorwärtsblickenden Airborne Laser Scanning urbaner Gebiete. gis.SCIENCE; Die Zeitschrift für Geoinformatik, 2013(2): 51-56

Hebel M, Arens M, Stilla U (2013): Change detection in urban areas by object-based analysis and on-the-fly comparison of multi-view ALS data. ISPRS Journal of Photogrammetry and Remote Sensing 86 (2013): 52–64

Hoegner L, Weinmann M, Jutzi B, Hinz S, Stilla U (2013): Synchrone Koregistrierung von 3d Punktwolken und thermischen Infrarotbildern. Oldenburger 3D Tage 2013

Hoegner L, Weinmann M, Jutzi B, Hinz S, Stilla U (2013): Co-registration of Time-of-Flight (TOF) camera generated 3d point clouds and thermal infrared images (IR). In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 481-488

Iwaszczuk D, Helmholz P, Belton D, Stilla U (2013): Model-to-Image registration and automatic texture mapping using a video sequence taken by a mini UAV. ISPRS Hannover Workshop 2013

Iwaszczuk D, Hoegner L, Stilla U (2013): Zuordnung von 3D Gebäudemodellen und IR-Videosequenzen mit Linienverfolgung. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 220-227

Jendryke M, Balz T, Jiang H, Liao M, Stilla U (2013): Using open-source components to process interferometric TerraSAR-X spotlight data. International Journal of Antennas and Propagation, 2013, Article ID 275635

Maksymiuk O, Brenner A, Stilla U (2013): Detection of stationary vehicles in airborne decimeter resolution SAR intensity images using morphological attribute filters. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 391-400

Novack T, Maksysymiuk O, Stilla U (2013): A concept for guiding the learning of conditional random fields for the classification of urban areas in SAR Images. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 152-159

Palm S, Maresch A, Stilla U (2013): Investigation on circular mapping by FMCW-SAR on small airplanes. ISPRS Hannover Workshop 2013,

Schmitt M, Brueck A, Schoenberger J, Stilla U (2013): Potential of airborne single-pass millimeterwave InSAR data for individual tree recognition. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 426-436

Schmitt M, Magnard C, Stanko S, Ackermann C, Stilla U (2013): Advanced high resolution interferometry of urban areas with the airborne millimeter radar MEMPHIS.

Schmitt M, Maksymiuk O, Magnard C, Stilla U (2013): Radargrammetric registration of airborne multi-aspect SAR data of urban areas. ISPRS Journal of Photogrammetry and Remote Sensing, 86 (2013): 11–20

Schmitt M, Stilla U (2013): Compressive sensing based layover separation in airborne single pass multi-baseline InSAR data. IEEE Geoscience and Remote Sensing Letters 10 (2): 313-317

Stilla U, Hebel M (2013): Änderungsdetektion beim vorwärtsblickenden Airborne Laser Scanning urbaner Räume. In: Hanke K, Weinold T (Hrsg) 17. Internationale Geodätische Woche Obergurgl 2013. Berlin: Wichmann, 228-237

Tuttas S, Stilla U (2013): Rekonstruktion von Fenstern aus Schrägsicht-ALS Punktwolken zur Anreicherung von Gebäudemodellen. In: Seyfert H (Hrsg) 33. Wissenschaftlich-Technische Jahrestagung der DGPF, 22: 363-372

Tuttas S, Stilla U (2013): Reconstruction of façades in point clouds from multi aspect oblique ALS. ISPRS Annals, II-3/W3: 91-96

Wissenschaftliche Vorträge

02-13 Hoegner L: Synchrone Koregistrierung von 3D Punktwolken und thermischen Infrarotbildern.12. Oldenburger 3D-Tage: Optische 3D-Messtechnik - Photogrammetrie - Laserscanning. Oldenburg

02-14 Darr T: Fehlerabschätzung zur Positionsbestimmung durch ein Multi-Kamerasystem für die globale Vermessung von Fahrzeugteilen.12. Oldenburger 3D-Tage: Optische 3D-Messtechnik - Photogrammetrie - Laser-scanning. Oldenburg

02-14 Hanel A: Reduktion der Positionsfehler eines Multi-Kamerasystems durch Schleifenschluss unter beschränkten Sichtbedingungen im teilmontierten Fahrzeugrahmen.12. Oldenburger 3D-Tage: Optische 3D-Messtechnik - Photogrammetrie - Laserscanning. Oldenburg

02-21 Stilla U: Änderungsdetektion beim vorwärtsblickenden Airborne Laser Scanning urbaner Räume. Internationale Geodätische Woche Obergurgl 2013. Austria, Obergurgl

02-28 Hoegner L: Co-registration of Time-of-Flight (TOF) camera generated 3d point clouds and thermal infrared images (IR). 33. Wissenschaftlich-Technische Jahrestagung der DGPF. Freiburg

02-28 Fang L: Improvement of motion estimation of the Taku Glacier using spaceborne SAR images. 33. Wissenschaftlich-Technische Jahres-tagung der DGPF. Freiburg

02-28 Hanel A: Orientierungsgenauigkeit eines Multi-Kamerasystems bei Roboter-bewegungen in einer Fahrzeug-karosse-rie. 33. Wissenschaftlich-Technische Jahrestagung der DGPF. Freiburg

02-28 Novack T: A concept for guiding the learning of conditional random fields for the classification of urban areas in SAR Images. 33. Wissenschaftlich-Technische Jahrestagung der DGPF. Freiburg

02-28 Iwaszczuk D: Zuordnung von 3D Gebäudemodellen und IR-Video-sequenzen mit Linienverfolgung. 33. Wissenschaftlich-Technische Jahres-tagung der DGPF. Freiburg

03-01 Darr T: Genauigkeit der inversen Naviga-tion bei hoher Passpunktsicht-barkeit zur Absolut-positionierung eines geführten Messsystems. 33. Wissenschaftlich-Tech-nische Jahres-tagung der DGPF. Freiburg

03-01 Maksymiuk O: Detection of stationary vehicles in airborne decimeter resolution SAR intensity images using morpho-logical attribute filters. 33. Wissenschaft-lich-Technische Jahres-tagung der DGPF. Freiburg

03-01 Tuttas S: Rekonstruktion von Fenstern aus Schrägsicht-ALS Punktwolken zur Anreicherung von Gebäudemodellen. 33. Wissenschaftlich-Technische Jahres-tagung der DGPF. Freiburg

03-01 Schmitt M: Potential of airborne single-pass millimeterwave InSAR data for individual tree recognition. 33. Wissen-schaftlich-Technische Jahres-tagung der DGPF. Freiburg

04-30 Stilla U: 3D Fernerkundung. 3D Kollo-quium: Verabschiedung von Prof. Dr. Maurus Tacke. Ettlingen: Fraunhofer Institut für Optronik , Systemtechnik und Bildauswertung (IOSB) (eingeladener Vortrag)

05-22 Fang L: Determination of glacier surface area using spaceborne SAR imagery. ISPRS Hannover Workshop 2013

05-22 Iwaszczuk D: Model-to-Image registration and automatic texture mapping using a video sequence taken by a mini UAV. ISPRS Hannover Workshop 2013

11-12 Tuttas S: Reconstruction of façades in point clouds from multi aspect oblique ALS. CMRT13 - CityModel, Roads and Traffic 2013. Antalya, Turkey

Bachelorarbeiten

Piper R (2013): Flugplanung und Simulation für die Datengewinnung zur automatischen Texturierung. Betreuer: Dorota Iwaszczuk, Konrae Eder

Pimpi J (2013): Auswertung historischer Luftbilder zur Dokumentation der Entwicklung des Schneeferners von 1892 bis 1915. Betreuer: Konrad Eder

Fu D (2013): Untersuchung zur Wirkungsweise und Kompatibilität unterschiedlicher Modelle der inneren Orientierung und deren Verzeich-nungsmodellen. Betreuer: Konrad Eder, Sebastian Tuttas

Schoenberger J (2013): Fusion of multi-base-line-multi-aspect InSAR data for urban surface model reconstruction. Betreuer: Michael Schmitt

Masterarbeiten

Talay AH (2013): Quantitative validation of simulated infrared scenes. Betreuer: Hoegner L, Stilla U, Gosling A (INSYEN AG)

Brueck A (2013): Extraktion von Einelbaeumen in Single Pass Millimeterwellen InSAR Daten. Betreuer: Schmitt M

Promotionen

Selby PB (2013): Bildgestuetzte 3D Vermessung von Patienten zur Positionierung für die radiologische Krebstherapie. Betreuer: Stilla U

Mitarbeit in Gremien

Stilla U

- Prodekan der Fakultät für Bauingenieur- und Vermessungswesen

- Studiendekan der Studiengänge Geodäsie und Geoinformation (G&G) und ESPACE

- Mitglied des Fachbereichsrates der Fakultät Bauingenieur- und Vermessungswesen

- Mitglied der Studienkommission Geodäsie und Geoinformation (G&G) der Fakultät Bau-ingenieur- und Vermessungswesen

- Vorsitzender der Eignungsfeststellungskom-mission des Masterstudienganges G&G der Fakultät Bauingenieur- und Vermessungswe-sen

- Mitglied im Prüfungsausschuss der Studien-gänge „Geodäsie und Geoinformation" und „Landmangement and Land Tenure" der Fa-kultät für Bauingenieur- und Vermessungs-wesen

- Mitglied im Prüfungsausschuss des Studien-gangs „Earth Oriented Space Science and Technology (ESPACE) der Fakultät für Bau-ingenieur- und Vermessungswesen

- Mitglied der Studienkommision „Earth Oriented Space Science and Technology (ESPACE) der Fakultät für Bauingenieur- und Vermessungswesen

- Vorsitzender des Ausschusses zur Prüfung der Zulassung zur Promotion von FH-Absol-

venten in der Fakultät für Bauingenieur- und Vermessungswesen

- Mitglied des Steering and Advisory Board des Studiengangs Land Management and Land Tenure
- Principal Investigator of International Graduate School of Science and Engineering (IGSSE)
- Mitglied in Berufungskommissionen TUM Professur für Bodenordnung und Landentwicklung, TUM Professur IAPG, TUM Professur GIS, TUM Juniorprofessur ESPACE, TUM Juniorprofessur MobilTUM
- Vizepräsident der Deutschen Gesellschaft für Photogrammetrie, Fernerkundung und Geoinformation
- Mitglied der Sektionen Geoinformation und Lehre der Deutschen Geodätischen Kommission
- Mitglied im wissenschaftlichen Ausschuss der Deutschen Geodätischen Kommission
- Mitglied des Wissenschaftlichen Beirates beim Amt für Geoinformationswesen der Bundeswehr
- Mitglied der Kommission für Glaziologie der mathematisch-naturwissenschaftlichen Klasse der Bayerischen Akademie der Wissenschaften

- Chair of ISPRS Working Group III/5 „Image Sequence Analysis" (2008-2012), Chair of ISPRS Intercommission Working Group III/VI "Pattern Analysis in Remote Sensing" (seit 2012)
- Mitglied "Atmospheric Sciences and Geophysics Panel", Academy of Finland, Helsinki
- Mitglied Editorial Board of Italian Journal of Remote Sensing

Hoegner L

- Mitglied der Studienkommission Geodäsie und Geoinformation
- Stellv. Studienfachberater Geodäsie und Geoinformation (Bachelor und Master)
- Secretary of ISPRS Intercommission Working Group III/VI "Pattern Analysis in Remote Sensing" (seit 2012)
-
Iwaszczuk D

- Secretary of ISPRS Working Group I/2 "LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms" (seit 2012)
- Stellv. Doktorandenvertreterin des Graduiertenzentrums Bau-Geo-Umwelt

Lehrstuhl für Methodik der Fernerkundung

Forschungsprojekte

- Forschungs- und Entwicklungsarbeiten für TerraSAR-X SAR-Prozessor (DLR)
- 4D-SAR: Lernmethoden auf der Grundlage von Radar-Tomographie und Radar-Simulation (DFG)
- Hochauflösende Simulation von Persistent Scatterer auf Basis von Objektmodellen (DLR)
- 3D Lokalisierung und Bewegungsschätzung von langzeitstabilen Streuern in hochaufgelösten, interferometrischen SAR-Daten
- 4D City: Erweiterung von 3D Stadtmodellen durch eine Verknüpfung mit zeitlichen Deformationssignalen, die aus hochaufgelösten Radardaten abgeleitet werden (TUM International Graduate School of Science and Engineering, Exzellenzinitiative des Bundes und der Länder)
- Tomopolis: Einbindung von TanDEM-X Daten in SAR Tomographie und Persistent Scatterer Interferometrie für die Verbesserung der Lokalisierung und Deformationsmessung für Einzelobjekte in Stadtgebieten

- Entwicklung interferometrischer Methoden zur Fusion von bistatischen TanDEM-X Multi-Aspekt-Daten (DLR)
- Hochauflösende geodätische Erdbeobachtung mit TerraSAR-X / TanDEM-X: Korrekturverfahren und Validierung (Munich Aerospace)
- Interpretation von Trajektorien generiert durch Personentracking aus Bildsequenzen (DLR)
- Echtzeitnahe 3D-Rekonstruktion aus Bildsequenzen (DLR)
- Safe Earth: Multisensorial Remote Sensing Techniques for Supporting Natural Disaster Management and Hazard Preparedness (TUM International Graduate School of Science and Engineering, Exzellenzinitiative des Bundes und der Länder)
- Forschungs- und Entwicklungsarbeiten für die Atmosphärenprozessoren von GOME-2 und Sentinel 5 Precursor (DLR)
- Einsatz von neuronalen Netzen für das Spurengas-Retrieval (DLR)

Veröffentlichungen

Auer S, Gernhardt S, Eder K (2013): Evaluation of Persistent Scatterer Patterns at Building Facades by Simulation Techniques. ISPRS Hannover Workshop 2013, 7-12.

Avbelj J, Iwaszczuk D, Müller R, Reinartz P, Stilla U (2013): Line-Based Registration of DSM and Hyperspectral Images. ISPRS Hannover Workshop 2011: High-Resolution Earth Imaging for Geospatial Information Hannover, Germany - May 21 - 14, 2013.

Avbelj J, Müller R, Reinartz P (2013): Fusion of Hyperspectral Images and Height Models Using Edge Probability. Proceedings of the 5th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Gainesville, Florida, USA.

Berger C, Voltersen M, Eckardt R, Eberle J, Heyer T, Salepci N, Hese S, Schmullius C, Tao J, Auer S, Bamler R, Ewald K, Gartley M, Jacobson J, Buswell A, Du Q, Pacifici F (2013): Multi-Modal and Multi-Temporal Data Fusion: Outcome of the 2012 GRSS Data Fusion Contest. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 6(3), 1324-1340.

Bieniarz J, Aguilera E, Mueller R, Zhu X, Reinartz P (2013): Application of Distributed Compressive Sensing in Hyperspectral Image Unmixing. Proceedings of the 8th EARSeL Imaging Spectrometry Workshop, Nantes, France

Bieniarz J, Zhu X, Mueller R, Reinartz P (2013): Sparse Spectral Unmixing with Endmember Groups Pre-Selection. Proceedings of the 5th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Gainesville, Florida, USA.

Ding L, Zhu X, Meng L (2013): Scientific Visualization for 4-D Building Deformation Data Analysis. Proceedings of the 26th International Cartographic Conference, Dresden, Germany.

Eineder M, Bamler R, Cong XY, Gernhardt S, Fritz T, Zhu XX, Balss U, Breit H, Adam N, Floricioiu D (2013): Globale Kartierung und lokale Deformationsmessungen mit den Satelliten TerraSAR-X und Tandem-X. Zeitschrift für Geodäsie, Geoinformation und Landmanagement (zfv), pp. 75-84, Heft 1, 2013.

Grohnfeldt C, Zhu X, Bamler R (2013): Jointly Sparse Fusion of Hyperspectral and Multispectral Imagery. Proceedings of IGARSS'13 Conference, 2013, Melbourne.

Shahzad M, Zhu X (2013): Building Façades Reconstruction Using Multi-View TomoSAR Point Clouds. In: Proceedings of Joint Urban Remote Sensing Event (JURSE) 2013, 163-166.

Shahzad M, Zhu X (2013): Reconstruction of building facades using spaceborne multiview TomoSAR point clouds. Proceedings of IGARSS'13 Conference, 2013, Melbourne.

Shahzad M, Zhu X (2013): Robust Building Façade Reconstruction From Spaceborne TomoSAR Points. Proceedings of Object Extraction for 3D City Models, Road Databases and Traffic Monitoring - Concepts, Algorithms, and Evaluation (CMRT 2013), Antalya, Turkey.

Tao J, Auer S, Reinartz P, Bamler R (2013): Object-based Change Detection for Individual Buildings in SAR Images Captured with Different Incidence Angles. Proceedings of IGARSS'13 Conference, 2013, Melbourne.

Shi Y, Zhu X, Ellero M, Adams NA (2013): Analysis of Interpolation Schemes for the Accurate Estimation of Energy Spectrum in Lagrangian Methods. Computers & Fluids 82(8), pp.122-131.

Szottka I, Butenuth M (2013): Advanced Particle Filtering for Airborne Vehicle Tracking in Urban Areas. IEEE Geoscience and Remote Sensing Letters, 11(3), 686-690.

Wang Y, Zhu X, Bamler R (2013): Feature-Based Fusion of TomoSAR Point Clouds from Multi-view TerraSAR-X Data Stacks. Proceedings of IGARSS'13 Conference, 2013, Melbourne.

Wang Y, Zhu X, Bamler R, Gernhardt S (2013): Towards TerraSAR-X Street View: Creating City Point Cloud from Multi-aspect Data Stacks. In: Proceedings of Joint Urban Remote Sensing Event (JURSE) 2013.

Zhu X, Bamler R (2013): A Sparse Image Fusion Algorithm with Application to Pan-sharpening. IEEE Transactions on Geoscience and Remote Sensing 51 (5), 2827-2836.

Zhu X, Wang Y, Gernhardt S, Bamler R (2013): Tomo-GENESIS: DLR's Tomographic SAR Processing System. In: Proceedings of Joint Urban Remote Sensing Event (JURSE) 2013.

Zhu X, Shahzad M (2013): Façade Reconstruction Using Multi-View Spaceborne TomoSAR Point Clouds. IEEE Transactions on Geoscience and Remote Sensing, in press.

Zhu X, Bamler R (2013): Sparse Reconstruction techniques for Tomographic SAR Inversion. Proceedings of the 2013 European Signal Processing Conference (EUSIPCO-2013), Marrakech, Morocco.

Zhu X, Grohnfeldt C, Bamler R (2013): Collaborative Sparse Image Fusion with Application to Pan-Sharpening. Proceedings of the International Conference on Digital Signal Processing (DSP2013), Santorini, Greece.

Zhu K, Neilson D, d'Angelo P (2013): Confidence-Based Surface Prior for Energy-Minimization Stereo Matching. German Conference on Pattern Recognition (DAGM), LNCS 8142, 91-99.

Zhu X, Grohnfeldt C, Bamler R (2013): Collaborative Sparse Reconstruction for Pan-

Sharpening. Proceedings of IGARSS'13 Conference, 2013, Melbourne.

Zhu X., Bamler R., Wang Y., Shahzad M. (2013): Tomographic Urban Imaging using TerraSAR-X High Resolution Spotlight Data Stacks. ESA Living Planet Symposium 2013, Edinburgh, United Kingdom.

Wissenschaftliche Vorträge

04-01 Zhu X: Exploiting Sparsity in Remote Sensing and Earth Observation, Invited Seminar, Purdue University, IN, US

04-21 Wang Y: Towards TerraSAR-X Street View: Creating City Point Cloud from Multi-aspect Data Stacks, JURSE 2013, Sao Paulo, Brazil

05-22 Avbelj J: Line-Based Registration of DSM and Hyperspectral Images, conference poster, ISPRS Workshop, Hannover, Germany

04-22 Gernhardt S: Evaluation of Persistent Scatterer Patterns at Building Facades by Simulation Techniques, ISPRS IPI Workshop, Hannover, Germany

04-23 Zhu X: Building Façades Reconstruction Using Multi-View TomoSAR Point Clouds, 2013 Urban Remote Sensing Joint event, Sao Paulo, Brazil

04-23 Zhu X, Tomo-GENESIS: DLR's Tomographic SAR Processing System, 2013 Urban Remote Sensing Joint event, Sao Paulo, Brazil

06-10 Cong X: Detection and Monitoring of Volcanic Deformation Using Advanced Interferometric SAR Techniques, TerraSAR-X Science Meeting 2013, Oberpfaffenhofen, Germany

06-11 Auer S: Facade structures in High Resolution SAR Images - Interpretation and Characterization, TerraSAR-X Science Team Meeting, Oberpfaffenhofen, Germany

06-11 Gernhardt S: Cities in Motion - TerraSAR-X Reveals Deformation of Single Buildings, TerraSAR-X Science Team Meeting, Oberpfaffenhofen, Germany

06-11 Zhu X: Tomographic Urban Mapping and Object Reconstruction Using TerraSAR-X Spotlight Data Stacks, 5th TerraSAR-X Scientific Meeting, Oberpfafenhofen, Germany

06.12 Zhu X: Towards a 6m TanDEM-X DEM: Non-local Methods for InSAR Filtering, 4th TanDEM-X Scientific Meeting, Oberpfafenhofen, Germany

06-26 Avbelj J: Fusion of Hyperspectral Images and Height Models Using Edge Probability, Florida, USA

07-03 Zhu X: Collabrative Sparse Image Fusion with Application to Pan-Sharpening, The 18th International Conference on Digital Signal Processing (DSP2013), Santorini, Greece

07-22 Auer S: Simulation-based Characterization of SAR Image Signature Patterns Related to Building Facades, IGARSS 2013, Melbourne, Australia

07-22 Auer S: Object-based Change Detection for Individual Buildings in SAR Images Captured with Different Incidence Angles, IGARSS 2013, Melbourne, Australia

07-22 Shahzad M: Reconstruction of building façades using spaceborne multiview TomoSAR point clouds, IGARSS 2013, Melbourne, Australia

07-22 Wang Y: Feature-Based Fusion of TomoSAR Point Clouds from Multi-view TerraSAR-X Data Stacks, IGARSS 2013, Melbourne, Australia

09-04 Burkert F: UAV-based monitoring of pedestrian groups, UAV-g 2013, Rostock, Germany

09-05 Zhu K: Confidence-Based Surface Prior for Energy-Minimization Stereo Matching, GCPR 2013, Saarbrücken, Germany

09-11 Zhu X: Sparse Reconstruction techniques for Tomographic SAR Inversion, 2013 European Signal Processing Conference (EUSIPCO), Marrakech, Morocco

09-12 Bamler R: Tomographic Urban Imaging using TerraSAR-X High Resolution Spotlight Data Stacks, ESA Living Planet Symposium 2014, Edinburgh, UK

09-12 Gernhardt S: Persistent Scatterers from TerraSAR-X Data Stacks: Localization Precision and Deformation Regimes in Urban Areas, ESA Living Planet Symposium, Edinburgh, United Kingdom

09-11 Avbelj J: Probabilistic approach for data fusion of Hyperspectral images and DSMs. Tel Aviv University, The Remote Sensing and GIS laboratory

10-09 Zhu X: Exploiting Sparsity for Remote Sensing, Keynote Tutorial, University of Siegen, Germany

10-28 Avbelj J: Fusion of Hyperspectral images and height data, Research Centre of the Slovenian Academy of Sciences and Arts, Institute of Anthropological and Spatial Studies

11-12 Shahzad M: Robust building façades reconstruction from spaceborne TomoSAR points, CMRT13 - City Models, Roads and Traffic, Antalya, Turkey

12-11 Cong X: InSAR Techniques for Reliable Deformation Estimation in Volcanic Areas and A First Glance of TanDEM-X DEM Accuracy –Test Site El Hierro Island, AGU Fall Meeting 2013, San Francisco, USA.

12-23 Zhu X: Exploiting Sparsity in Remote Sensing for Earth Observation, Invited Seminar, IECAS, Beijing, China

12-27 Zhu X: Exploiting Sparsity in Remote Sensing for Earth Observation, Open Lecture,

Harbin Institute of Technology, Harbin, China

12-28 Zhu X: Exploiting Sparsity in Remote Sensing for Earth Observation, Invited Seminar, SPOC 2013 (Int. Conf. Signal Processing, Optimization and Compressed Sensing), Harbin, China

Masterarbeiten

Hanrieder B (2013): Hochwasser in Thailand-Erstellung und Validierung von Flutmasken aus HR- und VHR- Daten zur Abschätzung monetär bewertbarer ökonomischer Verluste, Betreuer: Stefan Auer, Joachim Post (DLR)

Fischer P (2013): Evolutionary Algorithms for Remote Sensing of the Atmosphere, Betreuer: Stefan Auer, Diego Loyola (DLR)

Meßner M (2013): Robust and Efficient Monocular SLAM, Betreuer: Stefan Auer, Markus Ulrich (MVTec)

Alexy M (2013): Synergetische Nutzung von solaren und thermischen Kanälen zur Fernerkundung von Zirruswolken, Betreuer: Stefan Gernhardt, Luca Bugliaro (DLR)

Auszeichnungen

Avbelj J, Bieniarz J, Cerra D, Makarau A, Müller R (2013), Third prize of the IEEE Data Fusion Contest 2013, Topic: Evaluation of Multispectral Classification based on Ground Truth

-

Mitarbeit in Gremien

Bamler R

- Mitglied in Berufungskommissionen Honorarprofessur Radarfernerkundung (TU München) und Optische Systeme (Humboldt Universität Berlin)
- Programmausschuss EO der DLR-Agentur
- Programmthemensprecher Erdbeobachtung DLR
- Vorsitzender IT-Lenkungsausschuss des DLR
- Führungskreissprecher OP
- Standortleitung OP
- Vorstandsmitglied Munich Aerospace e.V.
- Experte für Remote Sensing Technology, Den Haag Permanent Court of Arbitration
- Mitglied HGF Think Tank
- Member Board of the Information Engineering Doctorate at the University of Naples
- Scientific/Technical Committee member for EUSAR 2014, IGARSS 2013, Living Planet Symposium 2013, SPIE 2013
- Reviewer Natural Sciences and Engineering Research Council of Canada (NSERC)
- Mitglied Expertenkreis zur EU-Förderung in den Bereichen Meereswissenschaften, Erdbeobachtung und Naturgefahren (BMBF)

Fraundorfer S

- Scientific Committee Member for UAVG-2013

Auer S

- Mitglied der Studienkommissionen der Studiengänge Geodäsie und Geoinformation und ESPACE, TUM

Lehrstuhl für Kartographie

Forschungsprojekte

- **Geographic Knowledge Discovery in Large Transportation Network**

The aim of the thesis is to explore the geographic knowledge from nationwide railway network in terms of its geometric design of route alignment. Geometric design for transportation facilities includes the design of geometric cross sections, horizontal alignment, vertical alignment, intersections, and various design details. These basic elements are common to all linear facilities, such as roadways, railways, and airport runways and taxiways. Although the details of design standards vary with the mode and the class of facility, most of the issues involved in geometric design are similar for all modes. In all cases, the goals of geometric design are to maximize the comfort, safety, and economy of facilities, while minimizing their environmental impacts. With the help of the thesis work, knowledge on how the geographic context in terms of terrain, land property, demographic, etc affect the design of the transportation alignment during the early stages of route planning are to be identified and with further validation by domain experts trivial patterns of the design can be eliminated. The developed method aims to transfer the knowledge in the actual verified cases to the new ones by investigating the sensitive geometric data of the existing transportation alignment, which may be used as a diagnosis tool to expose pitfall as well as assistant software to facilitate transportation planning. The challenge of the work includes three folds. First, what data source need to be investigated as many criteria are involved in transportation route planning so that corresponding data are needed; Second, how to identify non-trivial pattern of the design? Third, how to maximize the efficiency of the knowledge transfer process by leverage the power of HCI and machine learning technique. For now, we are designing a cluster analysis process to explore similarity of the geometric design patterns of horizontal alignment of railway routes in Bavaria state in Germany.

- **Comparative Study of Thematic Mapping and Scientific Visualization**

With the ever growing volume of large datasets, visual exploration of huge amount of data in information space becomes a necessity. Thematic mapping and scientific visualization are two dedicated areas for visualizing a wide range of domain-specific datasets. Since pre-digital era, thematic mapping has been the most popular means with well-established cartographical principles that supports our understanding of the geographical reality. As an outcome from computer technology, scientific visualization, which still lack sound design theories, has become an active and vital area to explore large volume of scientific data. Based on diverse historical developments and discipline focuses, thematic mapping has its unique series of concerns from data sources, data processing to thematic map design principles, which may be totally different from those in scientific visualizations, and vice versa. However, from a general perspective, thematic mapping and scientific visualization have large overlaps in terms of visualization methods. Although some interdisciplinary researches have been done between cartography and scientific visualization, there are still no comprehensive comparative studys on thematic mapping and scientific visualization. This research work concentrates on a systematical comparative study between these two disciplines to bridge the existing gaps and achieve a synergetic effect to visualize and explore large geospatial datasets.

- **Event Detection and Visualization of Volunteered Geographic Information (VGI)**

The aim of the joint project between TUM and Tongji University China is to detect and visualize events from Volunteered Geographic Information (VGI). This project focuses on the identification of location-based semantic events in Volunteered Geographic Information. Evolving datasets of VGI - OpenStreetMap and Geo tagged Google My Maps- will be continuously monitored to extract the occurred events. After event detection, patterns of individual events are mathematically modeled to classify the events. Finally, various geo-visualization and analytical methods will be modified or developed for the detected events.

- **Efficient graphic design and usability of image maps**

Image maps are widely used cartographic products which substitute or complement topographic maps. One significant application area is related with disaster management where a fast provision of updated maps is urgently needed. Image maps emerge when cartographic map elements are added to a rectified remote sensing image. To reduce the visual confusion of the map user, a visual hierarchy has to be introduced to the image map. According to conventional thematic map design principle, the base map should be kept homogenous and visually arranged in the background. However, the rectified image naturally has a very heterogeneous appearance and a heavy visual weight which may inhibit the visual figure-ground segregation. Although image maps are ubiquitous, little research work has been conducted in the scientific cartographic community on the question of how to enable efficient graphic design for the best visual perception of image maps.

This works develops design guidelines for image maps that allow users an efficient visual processing of the depicted geographic informa-

tion. Usability-driven geovisual highlighting of interactive elements play hereby a crucial role. Innovative and media-aware design principles will be developed and implemented within selected test scenarios to evaluate the usability of image maps.

Furthermore an interlace method of rectified remote sensing image and cartographic map elements for creating image maps will be investigated to substitute the established superimposetion process. This approach can reduce spatial information redundancy and make the contents of image maps more easily accessible as web map services.

- **Map matching for embedded car navigation systems**

  As a joint effort with BMW Group Research and Technology, Munich, this PhD project is dedicated to the development and refinement of mapmatching approaches for the efficient referencing and transformation of geodata, topologic and metric comparison of different maps as well as the fusion of digitalized maps and digital geodatabases. A particular emphasis is laid on the evaluation and quality assurance of the growing open-source datasets, especially, the road and navigation-related information provided by volunteered car drivers.

  In addition to geometric information, semantic attributes describing road segments, actual traffic situation and traffic signs as Point of Interest are also used to enhance the matching performance.

  The existing matching algorithms from previous PhD theses at the Chair of Cartography as well as methods introduced by georeferencing standards such as OpenLR will be elaborated and extended to satisfy new constraints such as the hardware capacity of an embedded infotainment system, incremental computation, and energy-efficient driving which needs the integration of terrain profiles in the road data base. The enriched road data will be used to guide the development of smart car navigation systems and design of real-time routing instructions in audio visual form.

  This project also aims to raise the awareness of data quality required by the industry partner and bridge the gaps among public, private and crowdsourcing data.

- **Spatial data adjustment theory and algorithms in automatic map generalization**

  This project mainly focused on two aspects:
  1) Research on the theory and algorithms of spatial data adjustment. Spatial data adjustment theory can be used in precision improvement of spatial data and map generalization. The total least squares method is an optimization technique that can obtain an optimized solution with various constraints. The total least squares method, which attracted many attentions recently, takes into account the errors both in the observations and the design matrix of the adjustment model.

  2) Research on auto map generalization using the adjustment theory. The adjustment theory and methods are used to model the constraints in map generalization. The area, topology relation, conflicts between objects can be constructed as constraints in the simplification process. The total least squares method which is an optimization technique can produce an optimized simplification result based on all the constraints.

- **Geo-visualization on PS-InSAR and TomoSAR results**

  The research topic is Geo-visualization on multi-dimensional PS-InSAR and TomoSAR results. Synthetic Aperture Radar (SAR) is the only remote sensing method to assess deformation in the order of centimeters and millimeters due to its coherent nature, using Persistent Scatterer SAR Interferometry (PSI) and Tomographic SAR (TomoSAR). Changes and deformation of different parts of individual buildings will be accessible for different types of users, e.g. geologists, civil engineers, decision makers, etc. To make full use of the available information, for example assisting geologists and urban planners in using the results, appropriate visualization is necessary. It is the goal of the proposed research project to use radar remote sensing for deformation measurements and to develop methods for the Geo-visualization and presentation of the multi-dimensional PS-InSAR and TomoSAR results in a user-friendly way.

- **Forecast analysis and visualization of lightning data**

  To generate knowledge from patterns and benefit from human cognitive abilities, meaningful visualizations of spatial data are essential. One general aim is to detect clusters of any kind in a dataset. This research focuses on a cluster analysis of complex dynamic point datasets that involve the both the space and the time.

  Investigations in this research also aim to assist visual analytical approaches. The concepts of visual analytics originate from the fields of information visualization or scientific visualization. Visual analytics focuses on analytical reasoning facilitated by interactive visual interfaces. In this research new algorithms will be developed to identify dynamic patterns from the data and visualize the interpreted patterns for different user groups.

  This research project focuses on a specific point dataset - lightning data. Using LINET, an European lightning sensor system, the position (x,y,z) and the exact time of each lightning can be detected. A dynamic 3D point clustering will be developed on these data whereby the determined clusters represent lightning cells (thunders). Appropriate visualizations of these dynamic lightning cells will also be investigated.

  The cluster analysis will provide further information about the lifetime of individual lightning cells, rising and sinking trends etc. In a second step a forecast about the change of lightning clusters will be conducted with the aim to provide reliable information as well as an appropriate visualiza-

tion about the movement and extension of lightning cells in 3D for the upcoming half an hour.

- **Indoor Location-based Services (LBS)**

With the growing of building size as well as interior complexity, it's difficult for people to get to know a very complicated overall structure. Even persons who think they are familiar with the building are likely to get lost when searching for a particular room or path. Since the rapid development of GPS positioning technology and ubiquitous computing device, Geographic Information System (GIS) based services are greatly involved in people's daily life and successfully improve people's understanding of outdoor environment, but face challenges when moving indoor. My research is focused on mapping and modeling indoor spatial objects for GIS that provide general indoor services such as indoor route planning.

At first stage indoor spatial objects' semantic information and relationships between these objects are studied. As a result of the study a model which integrates 2D indoor map data and 3D CityGML data and enriched with semantic information is built. Then several different data sources are examined and fused under the proposed model. For indoor routing purpose, routing method based on the model will be implemented; ways of interactively communicating routes with users will be studied.

Herausgeberschaften

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Veröffentlichungen

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Meng L (2013): Cartography and Maps beyond Discipline, Kartographische Nachrichten, Sonderheft Juni 2013, 115-122

Meng L, Yang J, Jahnke M, Murphy C, Freudenstein S and Nottbeck A (2013): ProZeit: Programm zur Fahrzeitoptimierung von Eisenbahn-Infrastruktur (German) Publication Technical University of Munich, 2013

Murphy C (2013): Space-Time Mapping of Mass Event Data, in Krisp J M (ed.) Progress in Location-Based Services, p. 45-55.

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Peters S, Meng L, Krisp J M, Gartner G, Ortag F, Buchroithner M. Burghardt D and Prechtel N. (2013): First conclusion of the new international Master of Science in Cartography From Pole to Pole, 26th International Cartographic Conference (ICC) Dresden, Germany, 25.-30.08.2013.

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Wissenschaftliche Vorträge

03-04 Polous K (2013) Mining Spatio-temporal Change-patterns from VGI History; A Case study on OpenStreetMap, Analysis & Visualization of MOVEment: Focus on Tangible

Results. HafenCity University, Hamburg, Germany. March 4-5, 2013

03-06 Krisp J M (2013) Visual clustering of spatio-temporal hotspots for taxi activity in Shanghai, GeoViz, Hamburg, 06.-08.03.2013

08-26 Peters S (2013) Visual Analysis of Lightning Data Using Space–Time-Cube, Dresden, 26th International Cartographic Conference 25.-30.8.2013

08-27 Ding L (2013) Visual Analysis of Large Amounts of 4-D Building Deformation Data,26th International Cartographic Conference 2013, Dresden, Germany, 25-30 August 2013

08-27 Jahnke M (2013) Typification of Facade Elements for Virtual Three-Dimensional City Models, 26th International Cartographic Conference 2013, Dresden, Germany 25-30 August 2013

08-29 Peters S (2013) First conclusion of the new international Master of Science in Cartography, Dresden, 26th International Cartographic Conference 25.-30.8.2013

09-24 Jahnke M (2013) Präsentation und Kommunikation von Indoor Routing Informationen, Arbeitsgruppe Automation in Kartographie, Photogrammetrie und GIS, Frankfurt am Main, 22.-24.09.2013

Posterpräsentationen

08-27 Wei L (2013) Urban Subsidence Surveillance combining PS-InSAR and Visual Analytics, 26th International Cartographic Conference 2013, Dresden, Germany, 25-30, August 2013

08-28 Peters S (2013) Building up an Archeological GIS based on the excavation of the Diana sanctuary in Nemi, 26th International Cartographic Conference, Dresden, 25.-30.8.2013

Promotionen

Jahnke M (2013) Nicht-Photorealismus in der Stadtmodellvisualisierung für mobile Nutzungskontexte

Zhang J (2013) A Congruent Hybrid Model for Conflation of Satellite Image and Road Database

Habilitationen

Krisp J M (2013) Geovisualization and Exploratory Spatial Data Analysis (Geovisualisierung und Explorative Analyse Räumlicher Daten)

Bachelorarbeiten

Frank P (2013) Nutzerfreundliches Design von 3D-Symbolen in Bildkarten. Betreuer: Christian Murphy

Zeidler C (2013) Vergleich von Open-Source Portalen zur Bereitstellung, Visualisierung und interaktiven Nutzung von Geodaten. Betreuer: Stefan Peters

Masterarbeiten

Keler A (2013) Visual analysis of traffic congestion on Shanghai FCD. Betreuer: Stefan Peters

Valkova K (2013) Modellierung und Visualisierung von einem Planungsprozess von Windkraftanlagen. Betreuer: Stefan Peters

Zhang P (2013) 3D Modeling and Visualization of Archaeological Data. Betreuer: Stefan Peters

Zhao L (2013) Visualization of trends and tendencies based on a spatial analysis as a demonstrator for a Local Information System (LIS) based on a sample region. Betreuer: Holger Kumke

Mitarbeit in Gremien

Meng L
– Geschäftsführende Vizepräsidentin Technische Universität München
– Mitglied des Senats DLR
– Mitglied des Kuratoriums des Deutschen Forschungszentrums
– Mitglied des Board of Trustees, Max-Planck-Institute of Biochemistry and Neurobiology
– Mitglied des Hochschulrats der Tongji Universität, Shanghai
– Mitglied des Ausschusses „Klimaschutzstipendien", Alexander von Humboldt Stiftung
– Lecture notes - Geoinformation and Cartography, Springer (Series Editor)
– Annals of GIS (International Editorial Board)
– Kartographische Nachrichten (International Editorial Board)
– Mitglied des Hochschulrats der Aalto-Universität in Helsinki