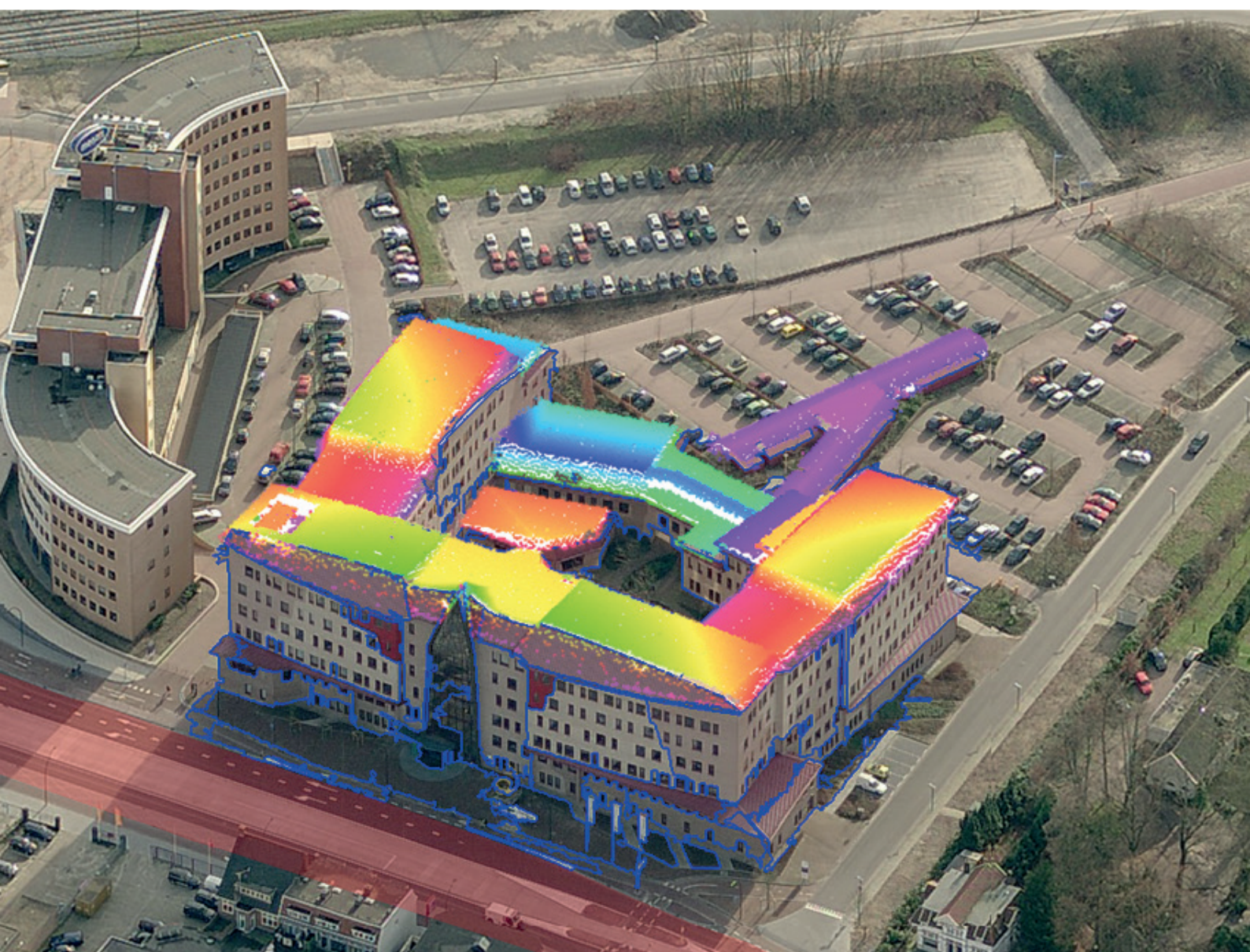


GEOBIA2016

SOLUTIONS & SYNERGIES

ENSCHDE 14-16 SEPTEMBER



PROGRAM



UNIVERSITY
OF TWENTE.

MY TOUCH SOLVING LAND PROBLEMS



PETER FOSUDO,
MASTER'S STUDENT GEO-INFORMATION SCIENCE AND EARTH OBSERVATION AT ITC

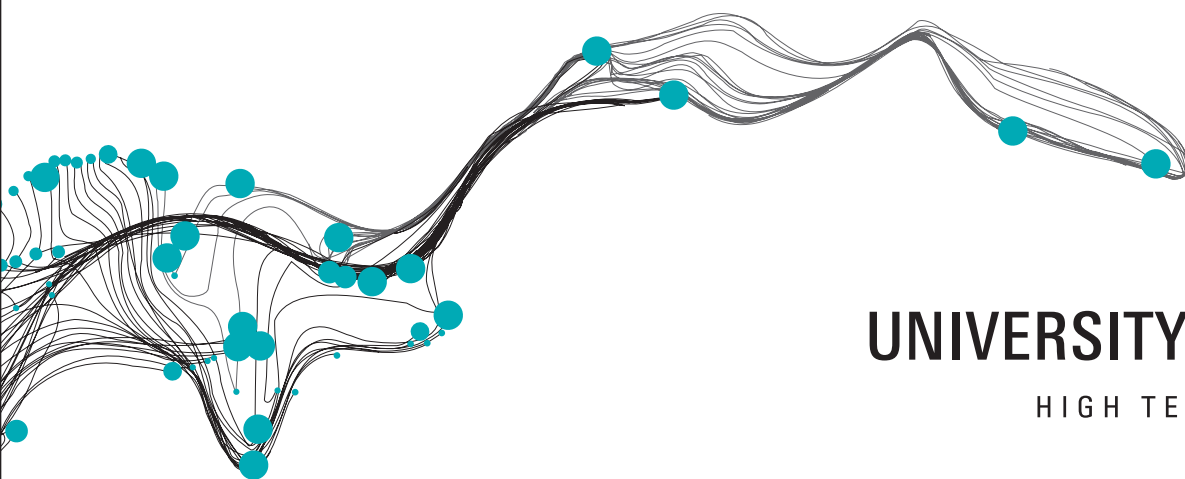
"I decided to study at ITC in order to obtain more knowledge and skills to be able to share with others. I want to be able to make even better use of my professional and scientific expertise. I opted for ITC because of its good reputation in the field of geo-information sciences and remote sensing. I eventually want to help solve problems in the field of land usage."

As Peter Fosudo has discovered, the faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente in Enschede, the Netherlands, is one of the world's foremost education and research establishments in the field of geo-information science and earth observation. We offer a wide range of the world's best degree courses in the following fields:

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- LAND ADMINISTRATION
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UNIVERSITY OF TWENTE.

HIGH TECH HUMAN TOUCH

Welcome

Dear delegates, colleagues and friends,

10 years have passed since the first GEOBIA in Salzburg, and since then the community has met in Calgary, Ghent, Rio de Janeiro and Thessaloniki. It is now our pleasure, on behalf of ITC/ the University of Twente, to welcome you to the 6th GEOBIA conference, themed (*Solutions & Synergies*).

As a research domain GEOBIA has undergone a tremendous development. What started out as a workshop of a relatively small group of researchers, has been drawing from the sustained enthusiasm of a growing community, resulting in a distinct sub-discipline of the GISciences. At the same time object-based analysis approaches have become common in many fields, such as computer vision and machine learning. To connect more with colleagues from those domains, with this conference we focus on how the different fields that use GEOBIA can better learn from each other.

Given ITCs mandate of technological capacity development, especially in economically less developed countries, we also wanted to use the conference to address the limited operational use of GEOBIA solutions, in governments, industry, NGOs etc. For that reason we included a benchmarking effort aimed at stimulating the development of

optimized, generic and transferable methods for standard GEOBIA problems, and arranged a plenary discussion with experts from different regions, to identify challenges in operationalization.

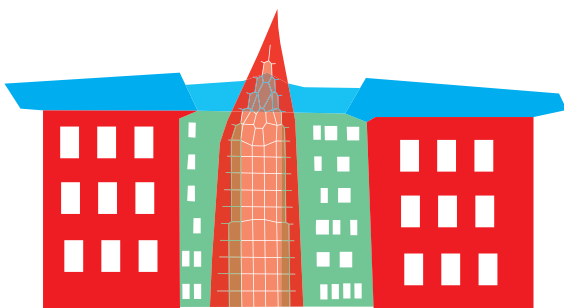
We are now looking forward to 3 days of exciting and stimulating presentations and posters, insightful keynotes and discussions, after already having had several days of advanced software training and a colloquium for young researchers. We have also scheduled a range of social events we hope you will enjoy.

Many people contributed to the planning of this event, and we especially acknowledge the input of the local and the international scientific organization committees, the support by the ITC local organization committee, the volunteers, as well as the sponsors of this conference.

We wish you an interesting and memorable time in Enschede.

On behalf of the organizing committee,

Norman Kerle, Markus Gerke and Sébastien Lefèvre,
chairs GEOBIA 2016



GEOBIA 2016

SOLUTIONS & SYNERGIES

Program at Glance

Day 01 Monday, 12 September 2016, ITC Building

13:30 - 17:00 PhD Colloquium

Day 02 Tuesday, 13 September 2016, ITC Building

09:00 - 17:00 Trimble eCognition Training

09:00 - 17:00 PhD Colloquium

17:30 - 19:00 Icebreaker

Day 03 Wednesday, 14 September 2016, Waaier Building Campus UT

09:00 - 10:45 Opening and Keynote Ed Parsons (Waaier 2)

10:45 - 11:15 Coffee

11:15 - 13:00 Trimble Session (Waaier 2)

13:00 - 14:15 Lunch

14:15 - 16:00 Technical Session: Segmentation (Carre 2M)

14:15 - 16:00 Technical Session: Solutions & Operationalization (Carre 2K)

14:15 - 16:00 Technical Session: Vegetation (Carre 2L)

16:00 - 16:30 Coffee

16:30 - 18:00 Poster Session: Classification & Change Detection (Poster Area 1)

16:30 - 18:00 Poster Session: Segmentation (Poster Area 2)

16:30 - 18:00 Poster Session: Solutions & Operationalisation (Poster Area 3)

19:00 - 21:00 Reception (Design Lab)



Day 04 Thursday, 15 September 2016, Waaier Building Campus UT

- 09:00 - 10:45 Keynotes Wolfgang Förstner and Lorenzo Bruzzone (Waaier 2)
- 10:45 - 11:15 Coffee
- 11:15 - 13:00 Technical Session: Classification (Carre 2M)
- 11:15 - 13:00 Technical Session: Machine Learning & Automation (Carre 2K)
- 11:15 - 13:00 Technical Session: Urban (Carre 2L)
- 13:00 - 14:15 Lunch
- 14:15 - 16:00 Technical Session: Accuracy & Time Series (Carre 2M)
- 14:15 - 16:00 Technical Session: Semantics (Carre 2K)
- 14:15 - 16:00 Technical Session: UAV Data & Point Clouds (Carre 2L)
- 16:00 - 16:30 Coffee
- 16:30 - 18:00 Poster Session: Novel OBIA applications (Poster Area 1)
- 16:30 - 18:00 Poster Session: UAV and Lidar Point Clouds (Poster Area 2)
- 16:30 - 18:00 Poster Session: Urban (Poster Area 3)
- 19:30 - 22:00 Conference Dinner (Faculty Club)

Day 05 Friday, 16 September 2016, Waaier Building Campus UT

- 09:00 - 09:45 Keynote Giles Foody (Waaier 2)
- 09:45 - 10:45 Plenary session Solutions & Synergies (Waaier 2)
- 10:45 - 11:15 Coffee
- 11:15 - 13:00 Poster Session: Machine Learning & Automation (Poster Area 1)
- 11:15 - 13:00 Poster Session: Vegetation (Poster Area 2)
- 11:15 - 13:00 Poster Session: Water (Poster Area 3)
- 13:00 - 14:15 Lunch
- 14:15 - 16:00 Technical Session: Machine Learning & Automation (Carre 2M)
- 14:15 - 16:00 Technical Session: Multi-Scale Analysis (Carre 2K)
- 14:15 - 16:00 Technical Session: Vegetation (Carre 2L)
- 16:00 - 16:30 Coffee
- 16:30 - 18:00 Closing session (Waaier 2)

Committees

Chairs

- Norman Kerle
- Markus Gerke
- Sébastien Lefèvre – University of Bretagne Sud

Local scientific committee

- Victor Jetten
- Freek van der Meer
- Francesco Nex
- Sander Oude Elberink
- Valentyn Tolpekin
- Tom Veldkamp
- Anton Vrieling
- Harald van der Werff

International scientific organization committee

- Elisabeth Addink - Utrecht University
- Cláudia Maria de Almeida - National Institute for Space Research
- Niels Anders - University of Amsterdam
- Paul Aplin - Edge Hill University (UK)
- Jagannath Aryal - University of Tasmania
- Christoph Aubrecht - Austrian Institute of Technology & The World Bank
- Thomas Blaschke - University of Salzburg
- Gilson Alexandre Ostwald Pedro da Costa - Pontifical Catholic University of Rio de Janeiro
- Lucian Drgu - West University of Timisoara
- Raul Queiroz Feitosa - Pontifical Catholic University of Rio de Janeiro
- Jorge Fernandez-Galarreta - Pix4D
- Ioanis Gitas - Aristotle University of Thessaloniki

- Richard Gloaguen - TU Bergakademie Freiberg
- Geoffrey Hay - University of Calgary
- Christian Heipke - University of Hannover & ISPRS
- Martin Herold - Wageningen University
- Peter Hofmann - University of Salzburg
- Kasper Johansen - University of Queensland
- Steven de Jong - Utrecht University
- Stefan Lang - University of Salzburg
- Jan de Leeuw - World Agroforestry Centre & Consultative Group on International Agricultural Research
- Marguerite Madden - University of Georgia
- Clément Mallet - IGN
- Tapas Martha - National Remote Sensing Centre Hyderabad
- Franz Rottensteiner - University of Hannover
- Martin Rutzinger - Institute for Interdisciplinary Mountain Research, Austrian Academy of Sciences
- Harry Seijmonsbergen - University of Amsterdam
- André Stumpf - University of Strasbourg
- Dirk Tiede - University of Salzburg
- Angelos Tzotsos - National Technical University Athens
- Fieke Van Coillie - Ghent University

Local organization committee

- Saskia Tempelmann
- Jorien Terlouw
- Laurens van der Velde
- Kim Hovestad – Bekmann
- Casper Rossing

Sponsor acknowledgement

We gratefully acknowledge the support by our sponsors.

Gold sponsors

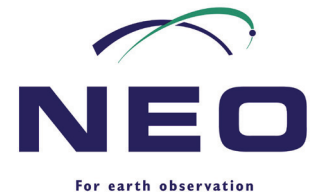


UNIVERSITY
OF TWENTE.

Trimble eCognition – From Geospatial Data to Information

The Trimble eCognition software suite is the original and most complete object-based image analysis package in the market. Trimble is happy to support the 6th GEOBIA conference as Gold sponsor, and the eCognition team is looking forward to demonstrate the latest eCognition features to improve, accelerate and automate the interpretation of geospatial data. By participating the conference and the pre-event training attendees will bring the latest OBIA techniques back to their organizations to solve even the most challenging image analysis tasks.

Bronze Sponsors



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Key Note Speakers

Ed Parsons,
Geospatial Technologist, Google

Wednesday, 14.9.2016, 9:30-10:30

Ed Parsons is the Geospatial Technologist of Google, with responsibility for evangelising Google's mission to organise the world's information using geography. In this role he maintains links with Universities, Research and Standards Organisations which are involved in the development of Geospatial Technology. He is currently co-chair of the W3C/OGC Spatial Data on the Web Working Group.

Ed was the first Chief Technology Officer in the 200-year-old history of Ordnance Survey, and was instrumental in moving the focus of the organisation from mapping to Geographical Information. He came to the Ordnance Survey from Autodesk, where he was EMEA Applications Manager for the Geographical Information Systems (GIS) Division. He earned a Masters degree in Applied Remote Sensing from Cranfield Institute of Technology and holds a Honorary Doctorate in Science from Kingston University, London and is a fellow of the Royal Geographical Society.

The focus of his presentation will be the Terra Bella project (<https://terrabella.google.com/>).



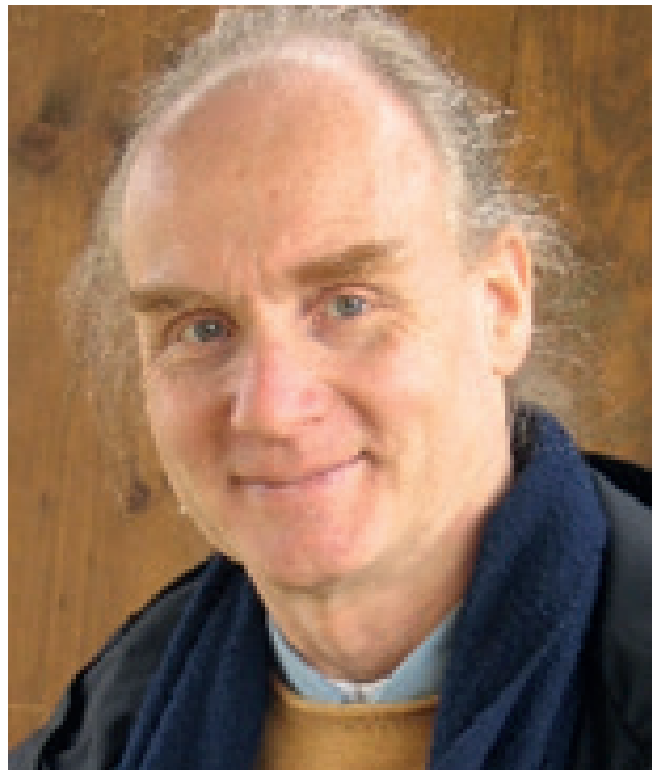
**Prof. Wolfgang Förstner,
University of Bonn (Germany)**

Thursday, 15.9.2016, 9:00-9:45

Wolfgang Förstner is Professor for Photogrammetry at the University of Bonn. His main research interests are statistical methods for image analysis, semantic modeling, and machine learning. He published around 200 scientific papers and supervised more than 30 PhD students. Wolfgang has been co-editor of the Zeitschrift für Photogrammetrie, Fernerkundung und Geoinformation (1990-1996) and associated editor of the IEEE Transactions on Pattern Analysis and Machine Intelligence (2006-2010). He chaired several ISPRS Working Groups and was President of the ISPRS Commission III (2004-2008). In 2016 he received the Brock Gold Medal Award for his outstanding contribution to the development in the fields of photogrammetry, remote sensing and spatial information sciences.

On Semantic Segmentation for Image Interpretation

Automatic interpretation of intensity or range images aims at deriving a rich semantic description of the scene solving a user specified task. The gap between the gridded or irregular structure of the measured data and the user's semantic model is classically bridged by supervised classification applied to the original data or to adequately aggregated data. Segmentation has played a key role for finding such aggregates and often can be interpreted as unsupervised clustering in some feature space. In order to overcome the disadvantages this two-step strategy, where the classification has no influence onto the segmentation, the concept of semantic segmentation has been propagated, which is kind of supervised clustering. In the talk we will discuss the progress in semantic segmentation and discuss its role for the interpretation of complex images.



Key Note Speakers

Prof. Lorenzo Bruzzone,
University of Trento (Italy),

Thursday, 15.9.2016, 9:45-10:30

Lorenzo Bruzzone received the Laurea (M.S.) degree in electronic engineering (summa cum laude) and the Ph.D. degree in telecommunications from the University of Genoa, Italy, in 1993 and 1998, respectively. He is currently a Full Professor of telecommunications at the University of Trento, Italy, where he teaches remote sensing, radar, pattern recognition, and electrical communications.

Dr. Bruzzone is the founder and the director of the Remote Sensing Laboratory in the Department of Information Engineering and Computer Science, University of Trento. His current research interests are in the areas of remote sensing, radar and SAR, signal processing, and pattern recognition. He promotes and supervises research on these topics within the frameworks of many national and international projects. He is the author (or coauthor) of 161 papers in referred international journals (111 in IEEE journals), more than 220 papers in conference proceedings, and 17 book chapters. He is editor/co-editor of 16 books/conference proceedings.

His keynote presentation is entitled “Current scenario and challenges in classification of remote sensing images”



**Prof. Giles Foody,
University of Nottingham (UK)**

Friday, 16.9.2016, 9:00-9:45

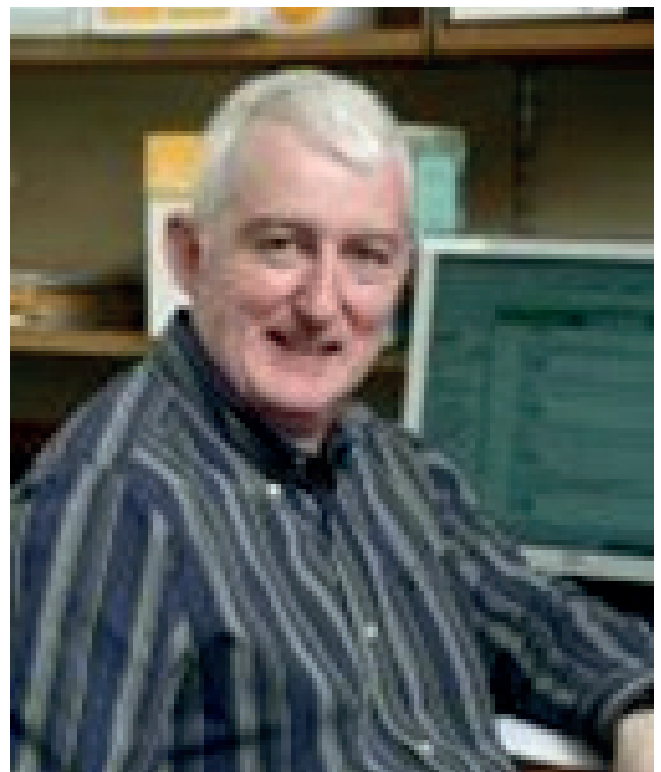
Giles M. Foody is Professor of Geographical Information Science at the University of Nottingham, UK. His main research interests focus on the interface between remote sensing, ecology, and informatics. Giles is founding editor-in-chief of Remote Sensing Letters and co-editor-in-chief of the International Journal of Remote Sensing, as well as a member of the editorial board of several other journals such as Remote Sensing of Environment, Landscape Ecology and Ecological Informatics. Topics of particular interest relate to image classification for land cover mapping and monitoring applications, addressing issues at scales ranging from the sub-pixel to global.

Observations on accuracy assessments of object-based image classifications

This presentation will focus on the assessment of the accuracy of object-based image classifications.

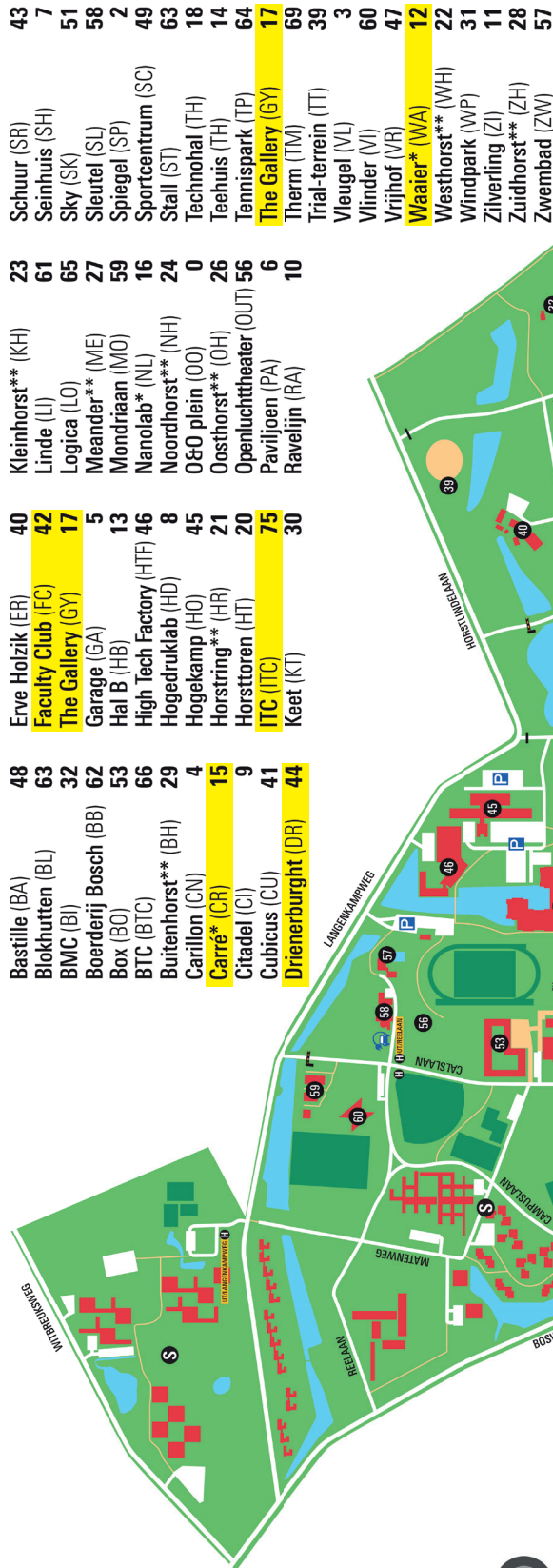
It will begin with an overview of the need for accuracy assessment. This will be followed by a summary of good practices for accuracy assessment, with particular regard to the three main stages encountered in traditional design-based assessments of accuracy: response design, sampling design and accuracy assessment.

Using an example from each stage some key issues in accuracy assessment of object-based classifications will be highlighted. The presentation will show that assessments of the accuracy of object-based classifications are often flawed but hopefully illustrate how they could be enhanced.



Location Map

MAP OF THE UNIVERSITY OF TWENTE



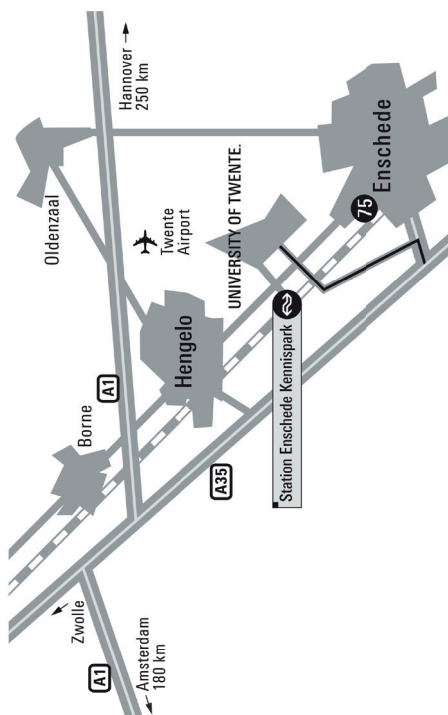
UNIVERSITY OF TWENTE.

Hengelo
Station Kennispark
Watersportcomplex
ITC 75
Enschede
A 35

This map is downloadable at
www.utwente.nl/campusmap
For a 3d-version see
maps.utwente.nl

Destination	Building number
FACULTIES	
Faculty of Behavioural, Management & Social Sciences (BMS)	10, 41
Educational Science and Technology; Psychology; Communication Studies; Philosophy of Science, Technology and Society; Teacher's training; Business Administration; Public Administration; European Studies; Industrial Engineering and Management	
Faculty of Engineering Technology (CTW)	20, 21, 22, 45
Civil Engineering; Industrial Design Engineering; Sustainable Energy Technology; Mechanical Engineering; Construction Management & Engineering	
Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS)	9, 11, 15
Electrical Engineering; Applied Mathematics; Business Information Technology; Creative Technology; Telematics; Computer Science; Embedded Systems; Mechatronics; Human Media Interaction; Systems and Control	
University College Twente (ATLAS)	9
Faculty of Science and Technology (TNN)	15, 20, 21, 24, 26, 27, 28
Advanced Technology; Biomedical Technology; Chemical Engineering; Health Sciences; Nanotechnology; Applied Physics; Technical Medicine	
Faculty of Geo-Information Science and Earth Observation (ITC)	75

Destination	Building number	Destination	Building number
INSTITUTES		Kennispark Twente (via parking Hengelosestraat)	17
CTIT Centre for ICT Research in Context	11	Library, IT & Archive (LISA)	47
ELAN	41	Mail room	5
IGS Institute for Governance Studies	10	Main Entrance	2, 3
ITC Faculty of Geo-Information Science and Earth Observation	75	Marketing & Communication Department (M&C)	2
MESA+ Institute for Nanotechnology	15, 16	Notebook Service Centre (NSC)	9
MIMIRA Institute for Biomedical Technology and Technical Medicine	28	O&O square	0
SERVICE DEPARTMENTS AND FACILITIES			
Acasa (student housing)	58	Physiotherapy (Topvorm Twente)	49
Admission Office	47	Professional Learning & Development (PLD)	10
Bicycle workshop 'De 2 ^e Versnelling'	53	Restaurants	12, 42, 47
Campus Company (reservations & events)	47	Science Shop (WeWi)	17
Central Student Administration (CSA)	47	Security & Info Centre	2
Centre for Educational Support (CES)	47	Shops (CINOP Supermarket)	51
Children's day care centre 'Vlinder' (Catalpa)	60	Sports centre	49
Culture centre, Vrijhof	47	Strategy & Policy (S&P)	2
Delivery	15	Student Counsellors, Counselling Service & Student Psychologists	47
DesignLab	17	Student Restaurant (Mensa)	12
Exam Hall (Therm)	69	Student Services & International Office	47
Executive Board (CvB)	3	Student Union	48
Facility Department (FB)	6	Studium Generale (SG)	47
Faculty Club	42	Study Information Office (SI)	2
Financial and Economic Affairs (FEZ)	2	Swimming Pool	49, 57
General Affairs (AZ)	2	TCP Language Centre (TCP)	47
General Practitioner & Dentist	58	Theatercafé Vrijhof	47
Hair Dresser (De Barreboeks)	51	Twente Academy (Young)	48
High Tech Factory	46	Twente Graduate School (TGS)	10
Hotel Drienerburgh	44	Unionshop	48
Hotel Logica	65	UT-Nieuws	47
Human Resources (HR)	2	UT Athletic Track	47
ICT Servicesdesk	9	Vestingbar	48
		Xerox Service Center	13



Visiting Address	ITC	Postal address
University of Twente	Hengelostraat 99	University of Twente
Orioneroilaan 5	7514 AE Enschede	Postbus 217
7522 NB Enschede		7500 AE Enschede

Route to the campus / University of Twente?

BY CAR

From the A1 motorway, take the A35 motorway in the direction of Enschede

Take exit 26: Enschede - West / Universiteit

Follow the signs 'Universiteit

BY TRAIN / BUS

From Enschede railway station:

line number 8 in the direction of Hengelo-Noord

line number 9 in the direction of Hengelo

From Enschede Kennispark railway station: line number 1 in the direction of 'Universiteit Twente', line number 3 in the direction of Hengelo

From Hengelo railway station:
line number 9 in the direction of Enschede

For more information, please visit www.9292.nl

Route to faculty ITC 75

Follow the route to the University

After the roundabout, turn right (follow 'Centrum')

After 3 km, you will find the ITC building at your right-hand side

General information

Registration desk

The registration desk is located near the central reception of the Waaier building, and will open daily at 8:00. Those who have not yet paid the registration fee can do so (in cash Euro). Alternatively, credit card-based payments can still be done via the University of Twente InternetKassa. Those joining a social excursion on Saturday, 17 September, can also pay at the registration desk.

Conference secretariat

The conference secretariat is located in Carré room 2N, near the parallel session rooms. It will also open daily at 8:00. Here speakers can upload their presentations to a central server, and presentations can then be accessed later in the parallel session rooms.

Information on bus schedules

There are a number of bus lines that connect the University campus

From Enschede railway station take either bus 1 to Kennispark/UT, or bus 8 or 9 to Hengelo, which stops on the main road close to the main entrance to the campus (see map)

From Enschede Kennispark railway station take bus 1 to Kennispark/UT.

From Hengelo railway station take either bus 8 or 9 to Enschede, which stops on the main road close to the main entrance to Kennispark/UT.

For all public transport schedules, see <http://9292.nl/en>

Emergency contact information

If you need assistance or have an emergency, best refer to the main Waaier reception desk.

Internet access information

Participants with an Eduroam account have internet access throughout campus. Those without can obtain login credentials at the reservation desk.

Printing facilities

There is a print shop in the Carré building (near the parallel session rooms) where prints of any kind (including posters) can be arranged.

Information for oral presentations

Speakers need to upload presentations in the conference secretariat as early as possible.

Reminder: presentations will be videotaped and later on placed on the website –speakers that do not agree with this need to inform the organizers.

Information for poster presentations

Poster boards are of A0 format (119 cm x 84 cm). Posters should be put up between 8:00 and 9:00, and taken down after 18:00 on the day the poster is scheduled. Posters submitted for printing can be picked up at the registration desk (the printing fee of 20 Euro per poster should be paid in cash at the registration desk).

Information about the reception by Enschede Municipality

The reception is co-hosted by Enschede Municipality, and will take place on Wednesday, 14 September, at 19:00, in the DesignLab (refer to map).

Information about the conference dinner (Thursday, 15 September, 19:30 Faculty Club, refer to map)

The conference dinner is included in the registration cost (for registered conference participants). It will take place on Thursday, 15 September, at 19:30, in the Faculty Club on campus (refer to map).

Social excursion

Please note that due to the low number of interested people the excursions may need to be cancelled. At press time we are still exploring options to have a sign-up sheet for still interested delegates at the registration desk.

Trip to Amsterdam

- Departure from University of Twente campus at 8:00 (departure location to be announced later)
- Arrival back in Enschede at around 22:00

Trip to Muenster

- Departure from campus at 8:00
- Arrival back in Enschede at around 18:00

For more details about the trips and visit itinerary see the Geobia website.



Detailed Program

Wednesday, 14 September 2016

9:00 - 10:45

Opening and Keynote

Ed Parsons

Location: Waaier 2

**Getting The Act Together:
Segmentation-Based Land Cover
Classification Using RapidEye
Imagery And Open Street Map
Ancillary Data**
Valozic, Luka

Veg-1: Vegetation I

Location: Carre 2L

Chair: Ioannis Gitas

11:15 - 13:00

Trimble Session

Location: Waaier 2

Sol: Solutions & Operationalization

Location: Carre 2K

Chair: Cláudia Maria Almeida

14:15 - 16:00

Seg: Segmentation

Location: Carre 2M

Chair: Jagannath Aryal

**InterSeg: A Distributed Image
Segmentation Tool**

Happ, Patrick Nigri; Ferreira, Rodrigo da Silva; Costa, Gilson Alexandre Ostwald Pedro da; Feitosa, Raul Queiroz; Bentes, Cristiana; Farias, Ricardo; Achancaray, Pedro...

**Segmentation Optimization In Object-
Based Image Analysis Through
Recognizing Patterns Between PSE-
NSR-ED2 Discrepancy Measure And
Scale Parameter**

Liu, Yong; Zhang, Yindan; Huang, Zhe; Wang, Miaomiao; Yang, Dong; Ma, Hongmei; Zhang, Yongxu; Li, Yanfu; Li, Hongwei; Hu, Xiaogang

**Automated Segmentation Parameter
Selection And Classification Of Urban
Scenes Using Open-Source Software**
Böck, Sebastian; Immitzer, Markus; Atzberger, Clement

**Adaptive Morphological
Segmentation - Concepts and Python
Implementations**

Herold, Hendrik; Meinel, Gotthard

**Agent Based Image Analysis (ABIA) –
preliminary research results from an
implemented framework**

Peter Hofmann, Vera Andrejchenko, Paul Lettmayer, Manuel Schmitzberger, Michael Gruber, Izzet Ozan, Mariana Belgiu, Thomas Josef Lampoltshammer, Roland Graf, Stefan Wegenkittl, Thomas Blaschke

**Enabling Reproducible OBIA with
Open-Source Software in Docker
Containers**

Knoth, Christian; Nüst, Daniel

Massive Dataset Processing

O'Neil-Dunne, Jarlath; MacFaden, Sean; Ahles, Noah

**DLM-Update - Integration of earth
observation technologies in IT
structures of the national mapping
authorities in an use case: Update of
the ATKIS®-DLM of the State Bureau
of Surveying and Geoinformation
Schleswig-Holstein**

Völker, Andreas; Gerschwitz, Andreas; Bicsan, Alexandra; Fischer, Michael; Klink, Adrian; Lucas, Christian; Müller, Sönke; Mütterthies, Andreas; Schmidt, Carsten; Stock...

**An Object-Based Image Interpretation
Application on Cloud Computing
Infrastructure**

Antunes, Rodrigo R; Happ, Patrick N; Bias, Edilson S; Brites, Ricardo S; Costa, Gilson A O P; Feitosa, Raul Q

**Comparison of Individual Tree
Delineation Using High Resolution
Multispectral Image and Lidar Data**
Xiao, Pengfeng; Kelly, Maggi; Guo, Qinghua; Ma, Qin

**Three-year assessment of the space-
time dynamics of burned forest in
the Brazilian Amazon, state of Mato
Grosso**

Souza, Eliana de; Beuchle, René; Grecchi, Rosana Cristina; Achard, Frédéric

**Object-based burnt areas detection
method based on Landsat images –
step forward automatic global high
resolution mapping**

Aleksandrowicz, Sebastian; Woniak, Edyta

**Agricultural Cropland Mapping Using
Conventional Black-and-white Aerial
Photography, Object-Based Image
Analysis And Random Forests**

Vogels, M.F.A.; de Jong, S.M.; Sterk, G.; Addink, E.A.

**Mapping Greenhouse Gas Emissions
and Removals From The Land Use,
Land Use Change, and Forestry
Sector at the Local Level**

Mitri, George; Karam, Jessica

16:30 - 18:00

**Poster-1-Class: Poster Session I
Classification & change detection
Location: Poster Area 1**

Quantifying Land Cover Change using an automated object-based workflow for the analysis of rainfall-induced shallow landslides

Kamps, Martijn; Zieher, Thomas; Seijmonsbergen, Arie Christoffel; Rutzinger, Martin

Susceptibility Mapping of Linear Erosion Processes Using Object-Based Analysis of VHR Images

Passo, Denilson P; Bias, Edilson S; Brites, Ricardo S; Costa, Gilson A O P; Antunes, Rodrigo R

Object-Based VHSR Image Classification Using Multiband Compact Texture Unit Descriptor

Djerriri, Khelifa; Safia, Abdelmounaime; Cheriguene, Rabia Sarah; Rahli, Hamida Samiha; Karoui, Moussa Sofiane

Application of object-based Accuracy Assessment for Land Cover Classification using RapidEye Images in the Southeastern Brazil

Prado, Daniel Fernando Costa; Carvalho, Luis Marcelo Tavares de Carvalho

Pairing Semantics and Object-based Image Analysis for National Terrain Mapping - A First-Case Scenario of Cirques

Arundel, Samantha

Landcover extraction using Landsat time series 1972-2014: application to the Syr-Daria Region (Uzbekistan)

Akmalov, Shamshodbek; Masson, Eric; Blanpain, Olivier

Object-oriented Land cover mapping in national geographical conditions census

Zhai, Liang; Sang, Huiyong; Qiao, Qinghua

Land Use/Cover Mapping By Hierarchical Object-Oriented Classification Of Hyperspectral And LiDAR Data fusion

Kiani, Kamel; Mojaradi, Barat; Esmaeily, Ali; Etesami, Nazanin

Multivariate Analysis in the selection of descriptors for classification oriented to geographic object

Antunes, Dinameres Aparecida; Ribeiro, Selma Regina Aranha

Characterization of the Land-cover and Land-use by Shape Descriptors in two areas in Ponta Grossa, PR, BR

Aranha Ribeiro, Selma Regina; Hamulak, Thays Marcela

Land Cover And Land Use Characterization With Geobia In The Pitangui River Basin Area, Paraná-Brazil

Prichoa, Carla Eva; Aranha Ribeiro, Selma Regina; Holgado, Pedro Molina

ArchaeOBIA: a quantitative image analysis of Palaeolithic artifacts

Masson, Eric; Lamotte, Agnès

**Poster-1-Seg: Poster Session I
Segmentation**

Location: Poster Area 2

Prediction of Optimal Segmentation Scale on a Per-Class Basis Using Combined Thematic and Spatial Metrics

Melville, Bethany; Lucieer, Arko; Aryal, Jagannath

Assessing Edge And Area Metrics For Image Segmentation Parameter Tuning And Evaluation

Meyer, Helgard; Van Niekerk, Adriaan

First experiments using the Image Foresting Transform (IFT) algorithm for segmentation of remote sensing imagery

Soares, Anderson Reis; Körting, Thales Sehn; Fonseca, Leila Maria Garcia

Multispectral Image Segmentation Based On Cartesian Complexes And Their Associated Oriented Matroids

Valero Medina, José Antonio; Lizarazo, Iván; Arbeláez, Pablo

Identifying Suitable Segmentation Parameters For An Object-based Image Classification

Atzberger, Clement; Immitzer, Markus; Böck, Sebastian; Schultz, Bruno; Vuolo, Francesco

Object-Based Image Analysis based on A Region-Line Primitive Association Framework

Wang, Min; Wang, Jie

Superpixels: The End of Pixels in OBIA. A Comparison of State-of-the-art Superpixel Methods for Remote Sensing Data

Csillik, Ovidiu

**Poster-1-Sol: Poster Session I
Solutions & operationalisation**

Location: Poster Area 3

Integration of Open-Source Tools for Object-Based Monitoring of Urban Targets

Antunes, Rodrigo R; Bias, Edilson S; Brites, Ricardo S; Costa, Gilson A O P

Supported mapping with multi sensor images through strategy focused on customization and integration of generalized classes by GEOBIA

Carla Bernadete Madureira Cruz, Paula Maria Moura de Almeida, Rafael Silva de Barros¹, Raúl Sánchez Vicens, Elizabeth Maria Feitosa da Rocha de Souza, Elisa Araújo Penna Caris, Manoel do Couto Fernandes¹, Paulo Márcio Leal de Menezes

An Object-Based Knowledge Model for a Distributed Image Interpretation Platform

Costa, Gilson A O P; Hofmann, Peter; Happ, Patrick N; Feitosa, Raul Q

How To Effectively Obtain Metadata From Remote Sensing Big Data?

Körting, Thales Sehn; Namikawa, Laercio; Fonseca, Leila; Felgueiras, Carlos

RSOBIA - A new OBIA Toolbar and Toolbox in ArcMap 10.x for Segmentation and Classification.

Le Bas, Tim

19:00 - 20:30

Reception

Location: Campus - Design Lab

Detailed Program

Thursday 15 September 2016

9:00 - 10:45

**Keynotes Wolfgang Förstner
and Lorenzo Bruzzone**

Location: Waaier 2

11:15 - 13:00

Class: Classification

Location: Carre 2M

Chair: Martin Weinmann

**Dynamic Objects: Unravelling
Vegetation Patterns In A Highly
Dynamic Fluvial Environment**

Addink, Elisabeth A; Douma, Harke;
Duindam, Yael T; Kleinhans, Maarten G

**Using Pure and Mixed Objects in
the Training of Object-Based Image
Classifications**

Costa, Hugo; Foody, Giles; Boyd, Doreen

**From Classification Results To
Topographic Maps**

Höhle, Joachim

**Object-based Integrated Landscape
Change Analysis: synergy of multi-
temporal LiDAR and very high
resolution orthophotos**

Kamps, Martijn; Seijmonsbergen, Arie
Christoffel; Bouten, Willem

**National Fuel Type Mapping
methodology using Geographic Object
- Based Image Analysis and Landsat
8 OLI imagery**

Tompoulidou, Maria; Stefanidou,
Alexandra; Grigoriadis, Dionysios;
Dragozi, Eleni; Stavrakoudis, Dimitrios;
Gitas, Ioannis

**Mach-1: Machine Learning &
Automation I**

Location: Carre 2K

Chair: Wolfgang Förstner

**DropBand: A Convolutional Neural Net-
work with Data Augmentation for Scene
Classification of VHR Satellite Images**

Yang, Naisen; Tang, Hong; Sun,
Hongquan; Yang, Xin

**On The Usability Of Deep Networks
For Object-Based Image Analysis**

Audebert, Nicolas; Le Saux, Bertrand;
Lefèvre, Sébastien

**Deep Learning for Superpixel-based
Classification of Remote Sensing
Images**

Gonzalo-Martín, Consuelo; Garcia-
Pedrero, Angel; Lillo-Saavedra, Mario;
Menasalvas, Ernestina

**Combining OBIA with Computer Vision
- How object-based image analysis
can be leveraged by pattern matching
techniques to find complex shape
objects.**

Jasvilis, Gediminas

**How To Get To The Most Accurate
Results With UAS - a System
Approach**

Hoffmann, Christian

Urban: Urban

Location: Carre 2L

Chair: Stefan Christian Lang

**Template Matching To Support
Earth Observation Based Refugee
Camp Analysis In Obia Workflows -
Creation And Evaluation Of A Dwelling
Template Library For Improving
Dwelling Extraction Within An Object-
Based Framework**

Krafft, Pascal; Tiede, Dirk; Füreder, Petra

**Scene Classification Of Urban Areas
Exploiting Multi-view High Resolution
Aerial Images**

Nex, Francesco; Dalla Mura, Mauro

**Uncertainties In Analysing The
Transferability Of The Generic Slum
Ontology**

Pratomo, Jati; Kuffer, Monika; Martinez,
Javier; Kohli, Divyani

**Detection of photovoltaic installations
in RGB aerial imaging: a comparative
study**

Puttemans, Steven; Van Ranst, Wiebe;
Goedemé, Toon

14:15 - 16:00

Acc: Accuracy & Time Series

Location: Carre 2M

Chair: Thomas Blaschke

**Map Legend And Response Design:
How Do They Affect Accuracy Of
GEOBIA Result**

Radoux, Julien; Bogaert, Patrick

**Assessing Downscaling Limits Of
Spatial Resolution For AWiFS And
LANDSAT 8 Data As Compared To
LISS IV**

Chauan, Akansha; Denis, Derrick Mario;
Kumar, Mukesh

**Assessing Uncertainties Associated
With Digital Elevation Models For
Object Based Landslide Delineation**

Feizizadeh, Bakhtiar; Blaschke, Thomas

**Towards a Typology of Land Cover
Evolutions Using High Resolution
Satellite Image Time Series:
Application to the Metropolitan Area
of Strasbourg (France)**

Guttler, Fabio Nor; Puissant, Anne;
Gańczarski, Pierre

Sem: Semantics

Location: Carre 2K

Chair: Peter Hofmann

Automated Near Real-Time Earth Observation Level 2 Product Generation for Semantic Querying

Baraldi, Andrea; Tiede, Dirk; Sudmanns, Martin; Belgio, Mariana; Lang, Stefan

3D Semantic Labeling of ALS Point Clouds by Exploiting Multi-Scale, Multi-Type Neighborhoods for Feature Extraction

Blomley, Rosmarie; Jutzi, Boris; Weinmann, Martin

Semantic Segmentation of Settlement Patterns in Gray-scale Map Images Using RF and CRF within an HPC environment

Schemala, Daniel; Schlesinger, Dmitrij; Winkler, Peter; Herold, Hendrik; Meinel, Gotthard

Semantic classification of urban buildings combining VHR images and GIS data

Du, Shihong

UAV: UAV Data & Point Clouds

Location: Carre 2L

Chair: Francesco Nex

Robust and Repeatable Ruleset Development for Hierarchical Object-Based Monitoring of Revegetation Using High Spatial and Temporal Resolution UAS Data.

Whiteside, Timothy; Bartolo, Renee

River floodplain vegetation classification using multi-temporal high-resolution colour infrared UAV imagery

van Iersel, Wimala; Addink, Elisabeth; Straatsma, Menno; Middelkoop, Hans

Small scale landform mapping by integrated optical (2D) and terrain (3D) UAV data

d'Oleire-Oltmanns, Sebastian; Gerasch, Simon; Tiede, Dirk; Lang, Stefan

Map Based Segmentation Of Airborne Laser Scanner Data

Wang, Yancheng; Oude Elberink, Sander

Aerial Image Based Geometric Refinement Of Building Models Derived From Airborne Lidar Data.

Jarzbek-Rychard, Małgorzata; Maas, Hans-Gerd

16:30 - 18:00

Poster-2-Novel: Poster Session II Novel OBIA applications

Location: Poster Area 1

Application Of GEOBIA To Map The Seafloor

Diesing, Markus

A Segmentation Approach to Delineate within-Field Zones for Differential Potash Interventions.

Oliveira, Ronaldo Pereira de; Benites, Vinicius de Melo

Using Object-Based Image Analysis to support crowdsourcing

Mihut, Emanuela; Dragut, Lucian

Local Climate Zone Mapping: A Case Study In Belgium

Verdonck, Marie-Leen; Van Coillie, Fieke

ATHENA: Center of Excellence in Cyprus in the Field of Remote Sensing for Cultural Heritage in the Areas of Archaeology and Cultural Heritage

Diofantos G. Hadjimitsis, Athos Agapiou, Kyriakos Themistocleous, Branka Cuca, Argyro Nisantzi, Rosa Lasaponara, Gabriele Nolle, Biagio Tucci, Nicola Masini, Thomas Krauss, Daniele Cerra, Ursula Gessner, Gunter Schreier

Applying Geobia method to analyze climate changes associated to energy generation - analysis about oil exploration onshore at Potiguar Basin

Alves, Agassiel de Medeiros; Amaro, Venerando Eustáquio

Poster-2-UAV: Poster Session II

UAV and lidar point clouds

Location: Poster Area 2

Synergy Between Aerial Imagery And Low Density Point Cloud For Automated Image Classification And Point Cloud Densification

Mohammed, Hani Mahmoud; Moussa, Adel; El-Sheimy, Naser

Gully Erosion Mapping With High Resolution Imagery And ALS Data By Using Tree Decision, Hierarchical Classification And OBIA

Tedesco, Andrea; Antunes, Alzir Felipe Buffara; Ribeiro, Selma Regina Aranha

Automatic Building Extraction from Airborne LiDAR Point Cloud Based on MeanShift Segmentation

Hui, Zhenyang; Hu, Youjian; Yevenyo, Yao Ziggah

Assessing The Capacity Of Point Cloud Analysis To Improve Object-Based Agricultural Land Cover Classification Using Discrete LiDAR Data In Cabadbaran, Agusan Del Norte, Philippines

Rollan, Therese Anne Montañez; Blanco, Ariel

Fusion Of Optical And Lidar Images For Urban Objects Recognition

Liao, Wenzhi; Coillie, Fieke; Zhang, Hongyan; Gautama, Sidharta; Philips, Wilfried

Using Spatial Point Pattern Analysis as Supplement for Object Based Image Classification of Trees

Tañada, Eric Luis Madamba; Blanco, Ariel

Automatic Recognition of Urban Objects using both Airborne LiDAR Points Cloud and Imagery

Zhao, Bing; Wang, Ruisheng; Cao, Jianzhong; Yang, Hongtao; Zhou, Zuofeng

Detailed Program

Thursday 15 September 2016

Fitting Point's Cloud From Laser Profiling To The Vectorization Of Buildings In Informal Settlements
Temba, Plinio; Botelho, Lucas Magno Rocha; Nero, Marcelo Antonio; Nogueira, Julia Couto

3-D object-based feature extraction from 3-stereo DSM in urban context
Kulesa, Kerstin; Lang, Stefan

Poster-2-Urb: Poster Session II Urban

Location: Poster Area 3

Robustness Of Rule Sets Using VHR Imagery To Detect Informal Settlements – A Case Of Mumbai, India
Naorem, Vichyson; Kuffer, Monika; Verplanke, Jeroen; Kohli, Divyani

Historic Aerial Photographs and Object-based Image Processing for a 3D Settlement Model Generation, Buildings Delineation and Landscape Change Analysis
Veljanovski, Tatjana; Kokalj, Žiga

Replacing The Use Of Texture And Sealed Area In Urban Fabric Classifications By Integration of Volume And Object Based Distance Calculations.
de Kok, Roeland; Wezyk, Piotr; Hejmanowska, Beata; Ksiek, Judyta

19:30 - 22:00

Conference Dinner

Location: Faculty Club

Friday 16 September 2016

9:00 - 9:45

Keynote Giles Foody

Location: Waaier 2

9:45 - 10:45

Plenary session

"Solutions & Synergies"

Location: Waaier 2

11:15 - 13:00

Poster-3-Mach: Poster Session III

Machine learning & automation

Location: Poster Area 1

A Pure Object-based Hierarchical Conditional Random Field Model for Semantic Classification of High Resolution Remote Sensing Imagery
Yang, Yun

Combining Feature-Space Euclidean Norm Transformation And Allometric Aggregation Data Analysis In Intensifying Machine Learning Algorithm For Classification Of Dominantly Agricultural Landcover
Pelayo, Jigg Lomarda; Villar, Ricardo

A Segmentation – Recognition Integrative Model For Classification By Fusing Both PAN And MS Images
Mao, Ting; Tang, Hong; Shu, Yang; Yang, Naisen

Comparing Machine Learning Classifiers for Object-Based Land Cover Classification Using Very High Resolution Imagery
Qian, Yuguo

An Object-based Semantic Classification Method of High Resolution Satellite Imagery Using Ontology
Gu, Haiyan; Li, Haitao; Yan, Li; Blaschke, Thomas

Poster-3-Veg: Poster Session III Vegetation

Location: Poster Area 2

Forest Cover Change Analysis by Object Based Method using SPOT and RapidEye Images

Gao, Yan; Gonzalez, Ignacio; Lopez-Sanchez, Jairo Gabriel; Skutsch, Margaret; Paneque-Galvez, Jaime; Mas, Jean Francois

Satellite Based Multi-scale Methods to support the governance of the Low-carbon Agriculture Plan (ABC Plan)
Simoes, Margareth; Ferraz, Rodrigo; Bégué, Agnes; Bellon, Beatriz

Mapping urban vegetation functional types integrating phenology-based classification with WorldView-2 imagery
Yan, Jingli; Zhou, Weiqi

Development of a knowledge driven Rule Set for Classification of Submerged Aquatic Vegetation (SAV) in a Clear Water Stream: Where do you draw the boundaries...?
Visser, Fleur; Buis, Kerst; Verschoren, Veerle; Schoelynck, Jonas

Detection And Monitoring Of Deforestation Objects In The Colombian Amazon Rainforest
Espejo, Javier; Lizarazo, Ivan; Galindo, Gustavo; Cabrera, Edersson

Value of Feature Reduction for Crop Differentiation Using Multi-Temporal Imagery, Machine Learning, and Object-Based Image Analysis
Gilbertson, Jason; Van Niekerk, Adriaan

Detecting Atlantic Forest Patches Applying GEOBIA And Data Mining Techniques

Girolamo Neto, Cesare Di; Pessôa, Ana Carolina Moreira; Körting, Thales Sehn; Fonseca, Leila Maria Garcia

Monitoring of Invasive Knotweeds (*Fallopia* sp.) Using UAV and Satellite Imagery

Brna, Josef; Vítková, Michaela;
Bartaloš, Tomáš; Dvoák, Petr;
Müllerová, Jana

Calibration and validation of vegetation height and canopy cover estimation with combination of PALSAR and Landsat imageries for a tropical upstream catchment in Indonesia

Rustanto, Andry; Booij, Martijn

Poster-3-Water: Poster Session III Water

Location: Poster Area 3

Mapping lakes on the Tibetan Plateau with LANDSAT imagery and object-based image analysis

Korzeniowska, Karolina; Korup, Oliver

Decision Tree Classification Model For Detecting And Tracking Precipitating Objects From Series Of Meteorological Images

Ramirez, Salomon; Lizarazo, Ivan

Coastal Changes And Movements On The Albanian Riviera

Kanjir, Ursa; Gregoric Bon, Natasa

Object Based Image Analysis Approach For Monitoring Snow Cover And Forecasting Water Discharge In Sahand Mountain, Iran

Feizizadeh, Bakhtiar; Seyfei, Hooshang;
Fatmei, Majid; Pourmoradian, Samereh

14:15 - 16:00

Mach-2: Machine Learning & Automation II

Location: Carre 2K

Chair: Sébastien Lefèvre

Web-based Platform for Remote Sensing Image Annotation through Active Learning Approach

Garcia-Pedrero, Angel Mario; Gonzalo-Martin, Consuelo; Lillo-Saavedra, Mario; Ortiz-Toro, César

A Deep Learning Approach for Urban Land Cover Classification from High-Spatial Resolution Imagery and Geomorphometric Variables

Lizarazo, Ivan; Ramirez, Salomon

Towards Automated Satellite Image Segmentation and Classification for Assessing Disaster Damage Using Data-specific Features with Incremental Learning

Vetrivel, Anand; Kerle, Norman; Gerke, Markus; Vosselman, George

An Open-Source Semi-Automated Processing Chain For Urban OBIA Classification

Grippa, Tais; Lennert, Moritz;
Beaumont, Benjamin; Vanhuysse, Sabine; Stephenne, Nathalie; Wolff, Eléonore

Automatic Detection of Landslides in Object-Based Environment Using Open Source Tools

Gorthi, Sai Subrahmanyam; Martha, Tapas Ranjan; Mishra, Deepak;
Nidamanuri, Rama Rao; V S, Veena

MultiSc: Multi-Scale Analysis

Location: Carre 2M

Chair: Lucian Dragut

Combining Multiple Resolutions into Hierarchical Representations for kernel-based Image Classification

Cui, Yanwei; Lefèvre, Sébastien;
Chapel, Laetitia; Puissant, Anne

Quantifying Bush Fire Mapping Uncertainty Using Multi-scale Approach: a Case Study from Tasmania, Australia

Aryal, Jagannath

Improving the Speed of Multiresolution Segmentation Using SLIC Superpixels

Csillik, Ovidiu; Lang, Stefan

Object-Based Symmetric Difference for Land Surface Segmentation Scale Parameter Optimisation

Louw, Gerrit Jacobus; van Niekerk, Adriaan; Rozanov, Andrei

Veg-2: Vegetation II

Location: Carre 2L

Chair: Frieke Marthe Bert Van Coillie

Using LIDAR And Aerial Photography To Build A Geographic Object Database Tuned For Ecological Model

Radoux, Julien; Defourny, Pierre

Detection, Segmentation and Localization of Individual Trees from MMS Point Cloud Data

Weinmann, Martin; Mallet, Clément;
Brédif, Mathieu

Modelling forest fire danger in Lebanon with the combined use of socio-economic and biophysical variables in object-based image analysis

Mitri, George; Antoun, Edward; Saba, Sabine; McWethy, David

Mangrove Classification Using Support Vector Machines and Random Forest Algorithm: A Comparative Study

Campomanes, Florencio V Puno; Pada, Ariadne Victoria Simbahon; Silapan, Judith Ramos

16:30 - 18:00

Closing session

Location: Waaier 2

Author Index

Achanccaray	Seg	Bias	Sol, Poster-1-Sol,
Achard	Veg-1		Poster-1-Class
Addink	Veg-1	Bicsan	Sol
Addink	UAV, Class	Blanco	Poster-2-UAV
Agapiou	Poster-2-Novel	Blanco	Poster-2-UAV
Ahles	Sol	Blanpain	Poster-1-Class
Akmalov	Poster-1-Class	Blaschke	Sol, Acc, Poster-3-Mach
Aleksandrowicz	Veg-1	Blomley	Sem
Almeida	Poster-1-Sol	Böck	Seg, Poster-1-Seg
Alves	Poster-2-Novel	Bogaert	Acc
Amaro	Poster-2-Novel	Booij	Poster-3-Veg
Andrejchenko	Sol	Botelho	Poster-2-UAV
Antoun	Veg-2	Bouten	Class
Antunes	Poster-2-UAV	Boyd	Class
Antunes	Poster-1-Class	Brédif	Veg-2
Antunes	Sol, Poster-1-Sol,	Brites	Sol, Poster-1-Sol,
	Poster-1-Class		Poster-1-Class
Aranha Ribeiro	Poster-1-Class,	Brna	Poster-3-Veg
	Poster-1-Class	Buis	Poster-3-Veg
Arbeláez	Poster-1-Seg	Cabrera	Poster-3-Veg
Arundel	Poster-1-Class	Campomanes	Veg-2
Aryal	Poster-1-Seg, MultiSc	Cao	Poster-2-UAV
Atzberger	Seg, Poster-1-Seg	Caris	Poster-1-Sol
Audebert	Mach-1	Carvalho	Poster-1-Class
Baraldi	Sem	Cerra	Poster-2-Novel
Barros	Poster-1-Sol	Chapel	MultiSc
Bartaloš	Poster-3-Veg	Chauan	Acc
Bartolo	UAV	Cheriguene	Poster-1-Class
Beaumont	Mach-2	Coillie	Poster-2-UAV
Bégué	Poster-3-Veg	Costa, A.O.P.	Seg, Sol, Poster-1-Sol,
Belgiu	Sol		Poster-1-Sol, Poster-1-Class
Belgiu	Sem	Costa, H.	Class
Bellon	Poster-3-Veg	Cruz	Poster-1-Sol
Benites	Poster-2-Novel	Csillik	Poster-1-Seg, MultiSc
Bentes	Seg	Cuca	Poster-2-Novel
Beuchle	Veg-1	Cui	MultiSc

d'Oleire-Oltmanns	UAV	Gautama	Poster-2-UAV
Dalla Mura	Urban	Gerasch	UAV
de Jong	Veg-1	Gerke	Mach-2
de Kok	Poster-2-Urb	Gerschwitz	Sol
Defourny	Veg-2	Gessner	Poster-2-Novel
Denis	Acc	Gilbertson	Poster-3-Veg
Diesing	Poster-2-Novel	Girolamo Neto	Poster-3-Veg
Djerriri	Poster-1-Class	Gitas	Veg-2
Douma	Class	Goedemé	Urban
Dragozi	Veg-2	Gonzalez	Poster-3-Veg
Dragut	Poster-2-Novel	Gonzalo-Martín	Mach-1, Mach-2
Du	Sem	Gorthi	Mach-2
Duindam	Class	Graf	Sol
Dvoák	Poster-3-Veg	Grecchi	Veg-1
El-Sheimy	Poster-2-UAV	Gregoric Bon	Poster-3-Water
Esmaeily	Poster-1-Class	Grigoriadis	Veg-2
Espejo	Poster-3-Veg	Grippa	Mach-2
Etesami	Poster-1-Class	Gruber	Sol
Farias	Seg	Gu	Poster-3-Mach
Fatmei	Poster-3-Water	Guo	Veg-1
Feitosa	Sol, Poster-1-Sol, Seg	Guttler	Acc
Feizizadeh	Acc, Poster-3-Water	Hadjimitsis	Poster-2-Novel
Felgueiras	Poster-1-Sol	Hamulak	Poster-1-Class
Fernandes	Poster-1-Sol	Happ	Sol, Poster-1-Sol, Seg
Ferraz	Poster-3-Veg	Hejmanowska	Poster-2-Urb
Ferreira	Seg	Herold	Seg, Sem
Fischer	Sol	Hoffmann	Mach-1
Fonseca	Poster-1-Sol	Hofmann	Sol, Poster-1-Sol
Fonseca	Poster-1-Seg	Höhle	Class
Fonseca	Poster-3-Veg	Holgado	Poster-1-Class
Foody	Class	Hu, X	Seg
Füreder	Urban	Hu, Y	Poster-2-UAV
Galindo	Poster-3-Veg	Huang	Seg
Gançarski	Acc	Hui	Poster-2-UAV
Gao	Poster-3-Veg	Immitzer	Seg, Poster-1-Seg
Garcia-Pedrero	Mach-1, Mach-2	Jarzbek-Rychard	UAV

Author Index

Jasvilis	Mach-1	Li, Y.	Seg
Jutzi	Sem	Liao	Poster-2-UAV
Kamps	Poster-1-Class, Class	Lillo-Saavedra	Mach-1, Mach-2
Kanjir	Poster-3-Water	Liu, Y.	Seg
Karam	Veg-1	Lizarazo	Poster-1-Seg, Poster-3-Veg, Poster-3-Water, Mach-2
Karoui	Poster-1-Class	Lopez-Sanchez	Poster-3-Veg
Kelly	Veg-1	Louw	MultiSc
Kerle	Mach-2	Lucas	Sol
Kiani	Poster-1-Class	Lucieer	Poster-1-Seg
Kleinhans	Class	Ma, H.	Seg
Klink	Sol	Ma, Q.	Veg-1
Knoth	Sol	Maas	UAV
Kohli	Urban, Poster-2-Urb	MacFaden	Sol
Kokalj	Poster-2-Urb	Mallet	Veg-2
Körting	Poster-1-Seg, Poster-1-Sol, Poster-3-Veg	Mao	Poster-3-Mach
Korup	Poster-3-Water	Martha	Mach-2
Korzeniowska	Poster-3-Water	Martinez	Urban
Krafft	Urban	Mas	Poster-3-Veg
Krauss	Poster-2-Novel	Masini	Poster-2-Novel
Ksieik	Poster-2-Urb	Masson	Poster-1-Class, Poster-1-Class
Kuffer	Urban, Poster-2-Urb	McWethy	Veg-2
Kulesa	Poster-2-UAV	Meinel	Seg
Kumar	Acc	Meinel	Sem
Lamotte	Poster-1-Class	Melville	Poster-1-Seg
Lampoltshammer	Sol	Menasalvas	Mach-1
Lang	UAV, Sem, Poster-2-UAV, MultiSc	Menezes	Poster-1-Sol
Lasaponara	Poster-2-Novel	Meyer	Poster-1-Seg
Le Bas	Poster-1-Sol	Middelkoop	UAV
Le Saux	Mach-1	Mihut	Poster-2-Novel
Lefèvre	Mach-1, MultiSc	Mishra	Mach-2
Lennert	Mach-2	Mitri	Veg-1, Veg-2
Lettmayer	Sol	Mohammed	Poster-2-UAV
Li, Haito	Poster-3-Mach	Mojaradi	Poster-1-Class
Li, Hongwei	Seg	Moussa	Poster-2-UAV

Müller	Sol	Rollan	Poster-2-UAV
Müllerová	Poster-3-Veg	Rozanov	MultiSc
Müterthies	Sol	Rustanto	Poster-3-Veg
Namikawa	Poster-1-Sol	Rutzinger	Poster-1-Class
Naorem	Poster-2-Urb	Saba	Veg-2
Nero	Poster-2-UAV	Safia	Poster-1-Class
Nex	Urban	Sang	Poster-1-Class
Nidamanuri	Mach-2	Schemala	Sem
Nisantzi	Poster-2-Novel	Schlesinger	Sem
Nogueira	Poster-2-UAV	Schmidt	Sol
Nolle	Poster-2-Novel	Schmitzberger	Sol
Nüst	Sol	Schnur	
O'Neil-Dunne	Sol	Schoelynck	Poster-3-Veg
Oliveira	Poster-2-Novel	Schreier	Poster-2-Novel
Ortiz-Toro	Mach-2	Schultz	Poster-1-Seg
Oude Elberink	UAV	Seijmonsbergen	Poster-1-Class, Class
Ozan	Sol	Seyfei	Poster-3-Water
Pada	Veg-2	Shu	Poster-3-Mach
Paneque-Galvez	Poster-3-Veg	Silapan	Veg-2
Passo	Poster-1-Class	Simoes	Poster-3-Veg
Pelayo	Poster-3-Mach	Skutsch	Poster-3-Veg
Pessôa	Poster-3-Veg	Soares	Poster-1-Seg
Peterson		Souza	Veg-1
Philips	Poster-2-UAV	Souza	Poster-1-Sol
Pourmoradian	Poster-3-Water	Stavarakoudis	Veg-2
Prado	Poster-1-Class	Stefanidou	Veg-2
Pratomo	Urban	Stephenne	Mach-2
Prichoa	Poster-1-Class	Sterk	Veg-1
Puissant	Acc, MultiSc	Stock	Sol
Puttemans	Urban	Straatsma	UAV
Qian	Poster-3-Mach	Strunck	Sol
Qiao	Poster-1-Class	Sudmanns	Sem
Radoux	Acc, Veg-2	Sun	Mach-1
Rahli	Poster-1-Class	Tañada	Poster-2-UAV
Ramirez	Poster-3-Water, Mach-2	Tang	Mach-1, Poster-3-Mach
Ribeiro	Poster-1-Class, Poster-2-UAV	Tedesco	Poster-2-UAV

Author Index

Temba	Poster-2-UAV	Xiao	Veg-1
Themistocleous	Poster-2-Novel	Yan, J.	Poster-3-Veg
Tiede	Urban, UAV, Sem	Yan, L.	Poster-3-Mach
Tompoulidou	Veg-2	Yang, D.	Seg
Tucci	Poster-2-Novel	Yang, H.	Poster-2-UAV
Valero Medina	Poster-1-Seg	Yang, N.	Mach-1, Poster-3-Mach,
Valozic	Seg		Mach-1
Van Coillie	Poster-2-Novel	Yang, Y.	Poster-3-Mach
van Iersel	UAV	Yevenyo	Poster-2-UAV
Van Niekerk	Poster-1-Seg, Poster-3-Veg,	Zhai	Poster-1-Class
	MultiSc	Zhang, H.	Poster-2-UAV
Van Ranst	Urban	Zhang, Yindan	Seg
Vanhuyse	Mach-2	Zhang, Yongxu	Seg
Veljanovski	Poster-2-Urb	Zhao	Poster-2-UAV
Verdonck	Poster-2-Novel	Zhou, W.	Poster-3-Veg
Verplanke	Poster-2-Urb	Zhou, Z.	Poster-2-UAV
Verschoren	Poster-3-Veg	Zieher	Poster-1-Class
Vetrivel	Mach-2		
Vicens	Poster-1-Sol		
Villar	Poster-3-Mach		
Visser	Poster-3-Veg		
Vítková	Poster-3-Veg		
Vogels	Veg-1		
Völker	Sol		
Vosselman	Mach-2		
Vuolo	Poster-1-Seg		
Wang, J.	Poster-1-Seg		
Wang, Miaomiao	Seg		
Wang, Min	Poster-1-Seg		
Wang, R.	Poster-2-UAV		
Wang, Y.	UAV		
Wegenkittl	Sol		
Weinmann	Sem, Veg-2		
Winkler	Sem		
Wolff	Mach-2		
Woniak	Veg-1		

MY TOUCH CONTRIBUTING TO URBAN PLANNING DECISION PROCESSES



JOSE ANDRES MORALES,
MASTER'S STUDENT GEO-INFORMATION SCIENCE AND EARTH OBSERVATION AT ITC

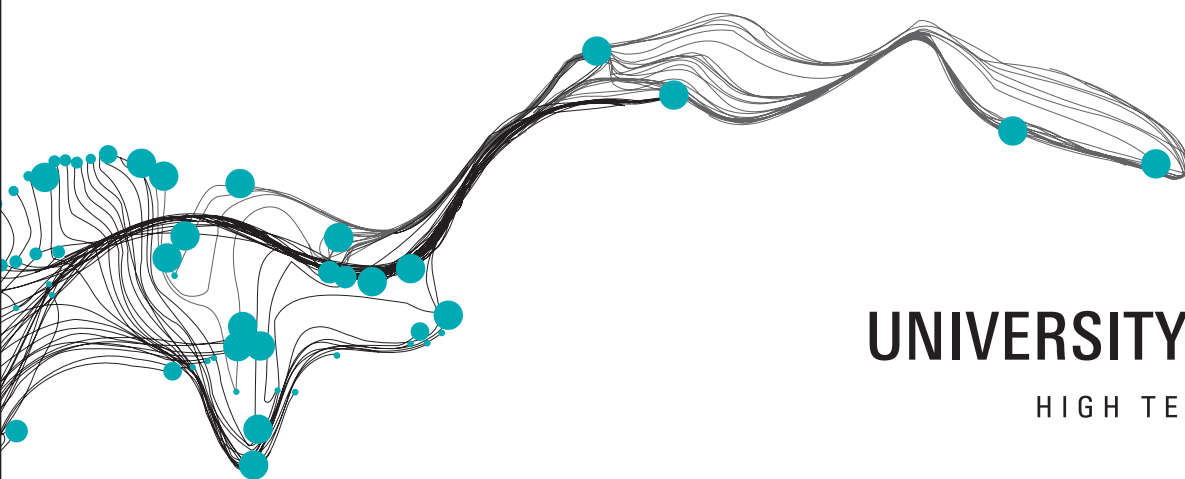
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