Innovations in Education at Faculty ITC and within Land Administration Programme

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dr. Dimo Todorovski, Course Coordinator Land Administration Programme
UNIVERSITY OF TWENTE.
HIGH TECH HUMAN TOUCH

• An entrepreneurial campus university established in 1961
• More than 10,000 students
• 3,300 staff members / 5 Faculties
  ▪ **BMS** Behavioural, Management and Social Sciences
  ▪ **ET** Engineering Technology
  ▪ **EEMCS** Electrical Engineering, Mathematics and Computer Science
  ▪ [ITC Geo-Information Science and Earth Observation](http://www.geospatialworldforum.org)
  ▪ **TNW** Science and Technology
Location

The Netherlands – in the cultural heartlands of Europe

Enschede:

• A distinctive modern and lively university town
• At the Eastern border of the Netherlands
• Surrounded by remarkable spots of natural beauty and tranquility
• Excellent connections to Amsterdam, Brussels, Paris, London, Zurich and Berlin
• An ideal center of operations
Faculty for Geo-Information Sciences and Earth Observations - ITC
“ITC is recognized worldwide for achievements in teaching, research and capacity development in the field of geo-information sciences and earth observation. We educate our students to be professionals, capable of acquiring knowledge and translating this into practical applications for solving real-world problems”
Six departments operating as centres of excellence

Covering the different fields of disciplinary interest that encompass ITC's core mission:

– Earth Observation Science
– Earth Systems Analysis
– Geo-information Processing
– Urban and Regional Planning and Geo-information Management
– Natural Resources
– Water Resources
Knowledge field

**DATA COLLECTION**
- Satellite data
- Aerial data
- Digital maps
- Field measurements
- Tabular data

**GIS**
- Modelling
- Internet GIS
- Processing
- Synthesis

**DISSEMINATION**
- Web portals
- Internet GIS

Knowledge field includes different stages: Collection of data through various methods (Satellite data, Aerial data, Digital maps, Field measurements, Tabular data) followed by GIS processing and synthesis. Results are then disseminated through Web portals and Internet GIS services.
GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

• Focus on tools and methods and on application of these in:
  – food security
  – water management
  – urban planning
  – land administration
  – disaster management
  – strengthening civil society
  – earth sciences
  – environmental management and biodiversity
SPECIALIZATIONS
IN THE DEGREE AND DIPLOMA PROGRAMMES

Geo-information science and earth observation for
• Applied Earth Sciences
• Geoinformatics
• Land Administration
• Natural Resources Management
• Urban Planning and Management
• Water Resources and Environmental Management
• NEW: Spatial Engineering
Land Administration Programme

dr. Dimo Todorovski, Course Coordinator Land Administration Programme

Faculty for Geo-Information Sciences and Earth Observation
Land / Land Administration

• Land is at the basis of all societies

• Land administration: a critical success factor for economic growth, food security, nature conservation and poverty reduction

• ‘the process of determining, recording and dissemination information about tenure, value and use of land when implementing land management policies’ (UN/ECE, 1996)

• A well-functioning land administration information system, is one of the main instruments for governments to implement their land policies
Land Administration in the World

• Only one quarter of the countries in the world maintain a complete land administration system – in regard of Land Tenure/Ownership, Land Use for Urban/Rural Planning and Land Value

• Conventional land titling programs incapable of bridging the gap; they fail to support the provision of a minimum form of land tenure security for
  – For all the citizens
  – Including vulnerable ones
Reality

Represent/Map/Document: People -> Land Relationship

Slides/pictures credit Dr. Mila Koeva
Reality is getting multi-dimensional

Slides/pictures credit Dr. Mila Koeva
Reality is getting multi-dimensional

(Stoter 2006, Stoter et al., 2012; Roic, 2012)
Reality is getting multi-dimensional

The 2D approach is not so efficient in complex, modern structures and also it’s hardly understandable.

Slides/pictures credit Dr. Mila Koeva
Cadastral survey and demarcation

Slides/pictures credit Dr. Mila Koeva
GNSS for LA

The Basics (GPS Segments, Signals, Clocks)

Accuracy aspects for LA

What application is most suitable? DGPS Receivers, quality and methods

Slides/pictures credit Dr. Mila Koeva
# Cadastral survey and demarcation

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<th>Speed</th>
<th>Cost</th>
<th>Accuracy</th>
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<tbody>
<tr>
<td>Chain and compass</td>
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<td>Plane table</td>
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<td>Total station</td>
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<td>Handheld GPS</td>
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<td>High Precision GPSS</td>
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<td>Imagery</td>
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<td>Note 1: many projects now combine ground and airborne tools</td>
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Slides/pictures credit Dr. Mila Koeva
The **multi-disciplinary approach** is not time-consuming compared with the past and is capable to provide data of very high accuracy and spatial resolution. This approach requires knowledge from different disciplines. For example geodesy, GNSS, GIS and photogrammetry are some of them.
DETAILED SENSOR COMPARISON FOR LA

• **Classification of sensors**
  – Depending of the platform (ground, airborne, spaceborne)
  – Depending of the type of energy (active, passive)
  – Depending of the way of measuring (analogue, digital)

• **Satellite characteristics**
  GSD, swath, sensor type, bands, type stereo, accuracy, price

• **Image characteristics**
  GSD, spatial, spectral, radiometric, temporal resolution

Slides/pictures credit Dr. Mila Koeva
1. technical concepts and tools
2. possibilities, but also the limitations
3. how to combine tools to create fit-for-purpose approaches
3D data challenges

- Scanning, digitizing, georeferencing
- Processing, storing, transferring, visualising, updating
- Quality
- Availability
- Metadata
- Automatization

“BIG DATA”
Advances in Responsible Land Administration

Jaap Zevenbergen, Walter de Vries, Rohan Mark Bennett

August 14, 2015 by CRC Press
Reference - 305 Pages - 24 B/W Illustrations
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For Librarians

Available on CRCnetBASE >>
Recap

Land
Land Administration
Represent/Map/Document

People -> Land Relationship

3D Challenges

International student life – Learn from each other

...
Fellowships

https://www.itc.nl/fellowships
Thank you for your attention!

Prof. Zevenbergen and dr. Dimo Todorovski