



The GE-UZ

Geoinformatics: enabling sustainable development in Uzbekistan www.geuz.eu & www.geoinformatics.uz

Highlights

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WORKSHOP AND REVIEW-MEETING IN SZÉKESFEHÉRVÁR

Training course was organized within the project from 13 October till 12 of November in 2013. Ten Project Advisory Board participants and 15 teachers from Uzbek partner universities came to review current situation of the project and participate in the training course that consist of various fields of Geoinformatics.



The Project Advisory Board participants from Uzbekistan and other EU delegation from EU partner universities had one week meeting to review current situation of the project such as results, problems, standard which should meet the national and EU standards, curriculum, accreditation and module development.

Meanwhile, fifteen teachers from four partner universities had participated in the training course which includes Geographical Information Systems, Remote Sensing, Project Management, Laser Scanning, Photogrammetry, GNSS Technologies, Cartography and Geovisualization and Database Management. The course was very interesting and intensive, because of the modern technologies and methods which can be used to develop textbooks for master program and can be applied to Uzbek

education system. Also the teachers collected a lot of literature and materials that will be helpful to develop master program and teach expected master students. There were several discussions about various topics and Uzbek teachers exchanged ideas related to teaching methods and skills with professors of the University of West Hungary and University of Salzburg. The module developers of master program had a chance to meet European professional teachers and discuss module content, take comments and recommendations. The Uzbek teachers finalized the chapter level descriptions and started to write textbooks.

They also visited to the Land Office in Szekesfehervar which is responsible for land use and land cadastre of Fejér country. Members of the office presented their

work process and databases which uses advanced technologies to store, analyse, control and retrieve spatial data. Land use management using internet was also introduced which is helpful for people to obtain data easily about specific land parcels through internet.

On another day they visited the Institute of Geodesy and Remote Sensing (FOMI) to get acquainted with work process and modern technologies. FOMI colleagues presented the use of Laser Scanning, Remote Sensing and Photogrammetry at their office. There were lot of discussions and questions from both sides. Uzbek participants also visited Photogrammetric labs and map archives where they had a chance to get knowledge about the evolution of mapping technologies in Hungary.

WORKSHOP IN SALZBURG

Work package 4 of the GE-UZ project aims to train teachers from the academic partner institutions in the discipline of GIS, Geodesy, and educational methods. Sixteen teachers from four Uzbek universities have been trained in spatial analysis methods and techniques during a four-week workshop at the University of Salzburg (PLUS), Department of Geoinformatics (Z_GIS), Austria from November 10 – December 7, 2013.

Several Z_GIS experts provided the most recent technological and methodological background to 16 Uzbek teachers, made them capable to sustain the MSc course after the project will be finished, and taught them the relevant knowledge of the academic content based on blended learning (using Moodle as LMS) with available e-learning materials supported with tutoring and field courses. A well-balanced workshop programme ranged from

Teaching Methods, the Bologna framework and ECTS, Overview of Map Algebra, Distance Analysis, Interpolation using Geostatistics, visit of the Global GIS DAY, a Field Trip “Urban Development in Salzburg” to GIScience Teaching Methods was held.

The outcomes of the training:

- ❖ 16 trained staff members; 4 staff members from each academic partner institutions from Uzbekistan; trainers from PLUS, UWH and UoG.
- ❖ certificate of attendance for each participant
- ❖ finalized versions of chapter level descriptions uploaded to Moodle platform

Workshop Topics:

- ❖ Spatial Analysis: Map Algebra, Distance Analysis, graphical modelling, Shapes and patterns, Network analysis, Interpolation – Deterministic methods, Interpolation using Geostatistics, Surface and DEM Analysis, Overlay Analysis
- ❖ Cartography & Geovisualization: Data dependent aggregation, classification & visualization, visual variables, Visual data exploration, Typography, map elements, Visual hierarchy, map layout, map dissemination

- ❖ Teaching Methods: Bologna / ECTS, Teaching Methods GIScience, Advanced Moodle Training
- ❖ Lesson and Chapter Level Descriptions
- ❖ Project Management and Organisation
- ❖ Competence Matrix
- ❖ Stakeholder Management
- ❖ Excursions: (BEV) Federal Office of Metrology and Surveying, Global GIS DAY, PLUS university library, National Park Berchtesgaden “Haus der Berge”, Field Trip “Urban Development in Salzburg”, guided city tour of Salzburg



INTRODUCTION ABOUT THE EQUIPMENT

The Tempus project finances the purchasing of 8 Total Stations, 4 GNSS rovers and base stations, several handheld GPS, 1 laser scanner with joint usage, 8 automatic levels and 8 laser distance measurer. We would like to introduce here some of the equipment:



Trimble M3 Servo and Mechanical Total Stations:

- ❖ One of the most Reliable Crew Members, Lightweight, compact and streamlined, the Trimble® M3 Total Station provides everything

one needs to get the job done right in demanding situations.

- ❖ Trimble Access Field Software On-board. Combine trusted mechanical total station reliability with the powerful, functional and modular software that modern users need today. Familiar, easy-to-use interface. Powerful data collection and calculation tools for fast results in the field. The Optional roads module provides streamlined workflows. Import road definitions from third-party resources. Key in a complete road definition that includes horizontal and vertical alignments, templates, and super elevation and widening records. Guides through fast offsets, slope staking, real-time design, and real-time quality control
- ❖ Trimble DR Technology included in it: Save time by reducing instrument setups to reach your desired measurement points. High-accuracy EDM provides fast, reliable measurements.
- ❖ It has bright and colourful QVGA touchscreen.
- ❖ Runs Windows Embedded CE 6.0 operating system, optimizes graphical-rich features of Trimble Access. Improved readability and menu navigation and Ergonomic controls plus integrated screen and keyboard streamline inputs



GNSS rover- Trimble R4

- ❖ A Complete GNSS System
- ❖ Lightweight, convenient and cable free
- ❖ Dual-frequency antenna enhances tracking capacity
- ❖ Delivers sub-millimetre phase centre stability
- ❖ Internally powered with removable batteries
- ❖ Comes standard with GPS L1, L2, L2C and QZSS
- ❖ Choose the level of GNSS support you require with flexible upgrade options including GLONASS, Galileo and BeiDou (COMPASS)
- ❖ Advanced Trimble R-Track Technology
- ❖ Integrated in to the Trimble R6, Trimble R-Track technology delivers:
 - ❖ Reliable, precise positioning performance
 - ❖ Signal Prediction compensates for intermittent or marginal RTK correction signals

- ❖ CMRx communications protocol provides correction compression for optimized bandwidth and full utilization of all the satellites in view
- ❖ Functions as a VRS Rover, RTK Rover or Field Base Station
- ❖ Use as a lightweight rover for static surveying or RTK
- ❖ Compatible with Trimble VRS solutions
- ❖ Built-in 450 MHz receive only radio or a fully integrated GSM/GPRS radio
- ❖ Integrated UHF transmit option



The Trimble® TX5 3D laser scanner is a revolutionary and highly versatile 3D scanning solution for a broad variety of scanning applications. The compact and lightweight design provides unmatched mobility at the job site, increasing field productivity. The intuitive and easy to use on-board interface allows new users to quickly get up to speed.

- ❖ Versatile and cost-effective
- ❖ Compact and portable
- ❖ Integrated colour camera for creating photorealistic scenes
- ❖ Intuitive touch screen interface ideal for new users

The Trimble TX5 is a revolutionary versatile scanning solution applicable to a broad array of applications:

- ❖ *Surveying*: Capture high resolution data for topographical maps, generating 2D and 3D CAD views, measure distances, areas, and volumes
- ❖ *Building Information Modelling - BIM*: Efficiently capture As-built and As-Is conditions for MEP or Structures contractors working on virtual design and construction (BIM) projects
- ❖ *Industrial Facilities*: Capture accurate as-built documentation of a facility for redesign and revamp projects or for updating existing plant documentation in 3D

- ❖ *Inspection/Reverse Engineering:* Extract measurements and create 3D models when there is no existing CAD data available. Perform detailed inspections and comparisons to existing models, surfaces and point clouds
- ❖ *Tunnelling:* Capture tunnel profiles and centrelines for comparison with design, measuring undercut/overcut and volumes of extracted materials
- ❖ *Crime Scene & Forensic:* Quickly and thoroughly document accident and crime scenes including colour for real world visualization

TRAINING IN TASHKENT

From 24th March until 4th April, in this year the Uzbek teachers will participate on a training titled as “Field Training Course on New Technologies”. The training will be led by Dr. Huaan Fan, KTH and his colleagues from Sweden. The aim of the training is to help teachers to acquire knowledge of new GNSS and GPS technology, usage of photogrammetric workstation and laser scanner. Sixteen teachers will participate.



- ❖ Geodetic reference systems: international and Uzbek systems
- ❖ Coordinate transformations

During the training the Uzbek teachers will participate in a project work called: Laser scanning and 3D modelling of a building in Tashkent. On a one-day field exercise they will gain knowledge about operation of a GNSS receiver. They will familiarise with Field survey of a small GPS network. On another field trip they will learn about how to survey using modern total stations and do a survey with modern levels.

At the end of the training a seminar will be organized, where the Uzbek colleagues will present the new technologies and make demonstrations about the usage of the new equipment and technologies.

Each Uzbek partner institution will establish a GIS lab due the support of the TEMPUS GE-UZ project. During the two week training the Opening Ceremony of each 4 GIS Lab will happen.



During these two weeks long training Uzbek colleagues will have the opportunity to learn and make experiences with the above outlined newly purchased equipment. Connecting to the equipment trainers will give lectures and practice on the following topics:

- ❖ Overview of new trends & new technologies in geodesy
- ❖ Laser scanning -principle and applications
- ❖ Operation of a laser scanner
- ❖ Processing and visualization of laser scanning data
- ❖ GNSS systems, signals and atmospheric effects
- ❖ GNSS observables. DGPS. Real-Time kinematic (RTK) survey
- ❖ Post-processing of GPS data
- ❖ RTK survey using a base and a rover
- ❖ Processing of measurements from total stations and levels

For more information or to send your comments on GE-UZ please contact:

Prof Dr Bela Markus,
GE-UZ TEMPUS Project Manager
Faculty of Geoinformatics,
University of West Hungary
Pirosalma u 1-3.
Székesfehérvár H-8000
Email: ge-uz@geo.info.hu

Or
Odil Akbarov
GE-UZ TEMPUS National Coordinator
Tashkent Institute of Irrigation and Melioration
Qori Niyoziy 39,
Tashkent UZ-100000
Email: odilxon@yahoo.com