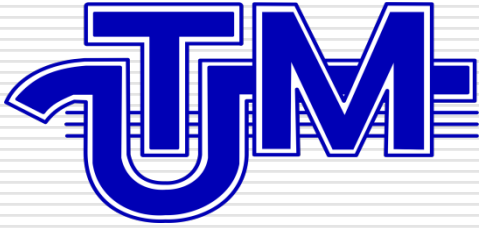


TECHNICAL UNIVERSITY OF MOLDOVA



**United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the
Applications of Global Navigation Satellite Systems,
Trieste, Italy, 1 – 5 December 2014**



MODERNIZATION AND DEVELOPMENT NEW CURRICULA ON GNSS-RELATED GEODETIC INFRASTRUCTURES, MOBILE IT AND PRECISE NAVIGATION TECHNOLOGIES FROM TECHNICAL UNIVERSITY OF MOLDOVA ACCORDING TO EUROPEAN COUNTRIES. PRESENT AND FUTURE

**Ass. Prof. Dr. Livia Nistor- Lopatenco
Head of Geodesy, Cadastre and
Geotechnics Department, TUM**

PRESENTATION OBJECTIVES...

After signing the Association Agreement between the Republic of Moldova and the European Union, on 27 June 2014 in Brussels, in Moldova began changes - creating European standards of democracy and prosperity, including higher education .

Creation of new curricula, at the specialty Geodesy, Topography and Cartography, by 2016 at the latest.

Encourage the involvement and motivation of students in scientific research.

SUBJECTS...

**MODERNIZATION OF EDUCATIONAL SYSTEM IN
MOLDOVA**



**CURRICULUM DEVELOPMENT OF THE TUM, GTC
SPECIALITY**



CADASTRAL WORKS, MINICAD VIA SMARTPHONES

VERY IMPORTANT STRIDES...

1. Approve Code of Education
 2. Approve Education Strategy – 2020
 3. Create National Agency for Quality Assurance in Vocational Education – NAQAVE
 4. European Agency will evaluate I cycle programs, and Cycle II; Master Programs in Law
 5. German Accreditation Agency AQAS will evaluate 3 programs of I study cycle, in 2015, for **accreditation** of the TUM;
 - a) Electro mechanics;
 - b) Geodesy, Topography and Cartography;
 - c) Engineering of textile
-

STRATEGIES FOR NEW EDUCATION CODE...

Level 0 level 5
secondary education
post-secondary technical professional



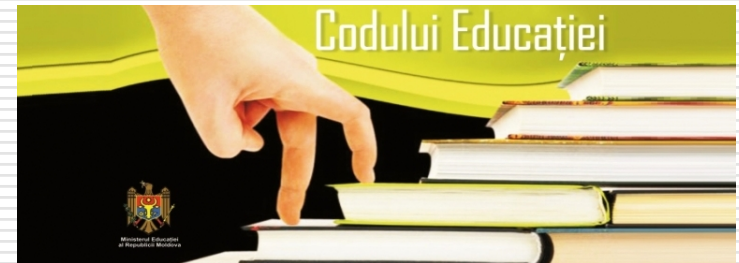
Level 6
higher education, first cycle:
license higher education



Level 7
higher education, second cycle:
masters higher education



Level 8
higher education, third cycle:
PhD higher education



SECTORIAL STRATEGY OF DEVELOPMENT

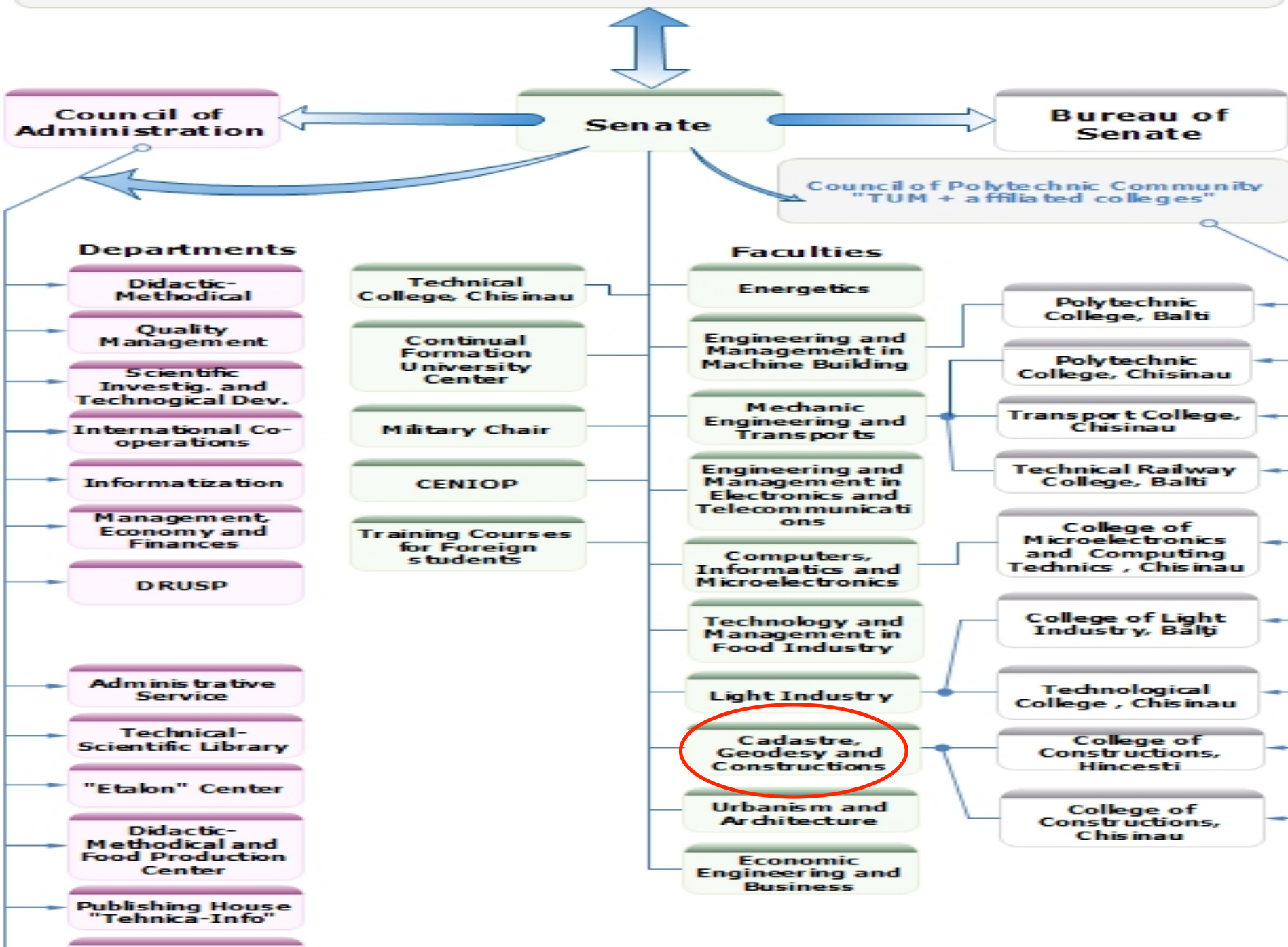
"Education - 2020" ...

The strategy is structured on three pillars - **access, relevance, quality** - and includes strategic vision for each component, general and specific objectives, priority actions, funding mechanisms and costs of actions to be taken

NATIONAL AGENCY FOR QUALITY ASSURANCE IN VOCATIONAL EDUCATION – NAQAVE ...

- ❑ 10 members, collaborators from various state universities in Moldova;
 - ❑ 1 student;
 - ❑ chosen through open competition of the Ministry of Education of the Republic of Moldova;
 - ❑ Democratic contest.
-

TECHNICAL UNIVERSITY OF MOLDOVA



HISTORY



1964-2014
50 years TUM

INTERNATIONAL
DECORATION
“EUROPEAN QUALITY”
FOR TECHNICAL
UNIVERSITY OF



HISTORY

The training of those about 11570 students at the full time and part time sections is supervised by a teaching staff of 700 persons, two thirds of them having scientific degrees of Academician, Professor, Associate Professor, Doctor of Science, Philosophy Doctor.



TUM offers courses at about 64 specialties and specializations - cycle I (Bachelor), 62 - cycle II (Master) and 63 - Doctorate, preparing engineers for almost all branches of the national economy.



University studies at TUM are organized on the basis of the European system of transferable academic credits (ECTS). This system permits the diplomas to be compatible with those of the European countries. As a result, the students and the specialists have the possibility to activate in the European area.

THE BOLOGNA PROCESS...

Bachelor Degree – 3/4 years (240/180 ECTS)

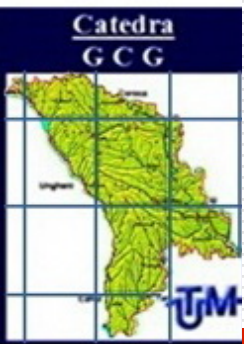


Master Degree – 2/1.5 years (120/90 ECTS)



PhD – 3 year (240 ECTS)





DEPARTMENT OF GEODESY, CADASTRE AND GEOTECHNICS...

I CYCLE

- Geodesy, Topography and Cartography

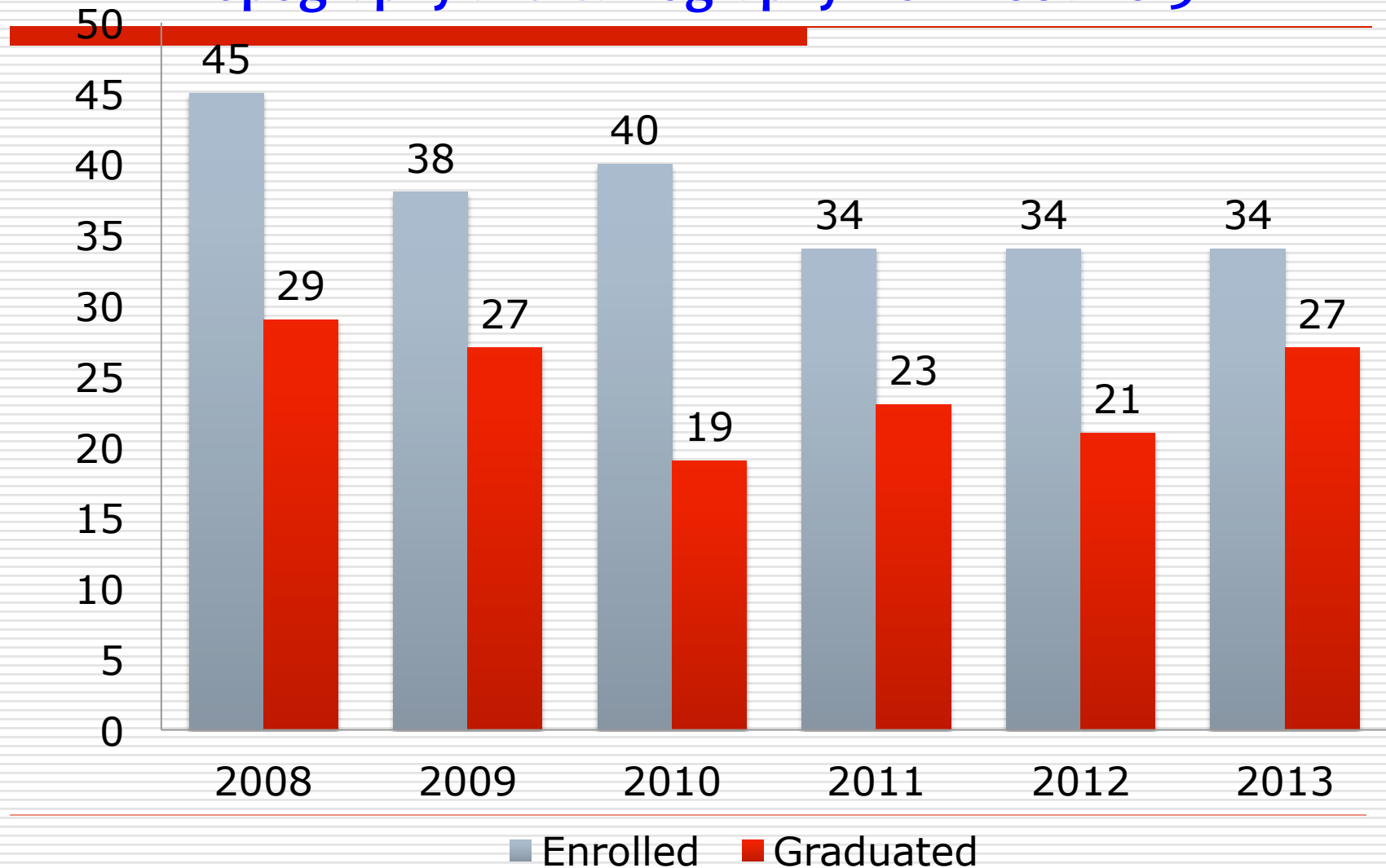
II CYCLE

- Cadastre and Real Estate Development

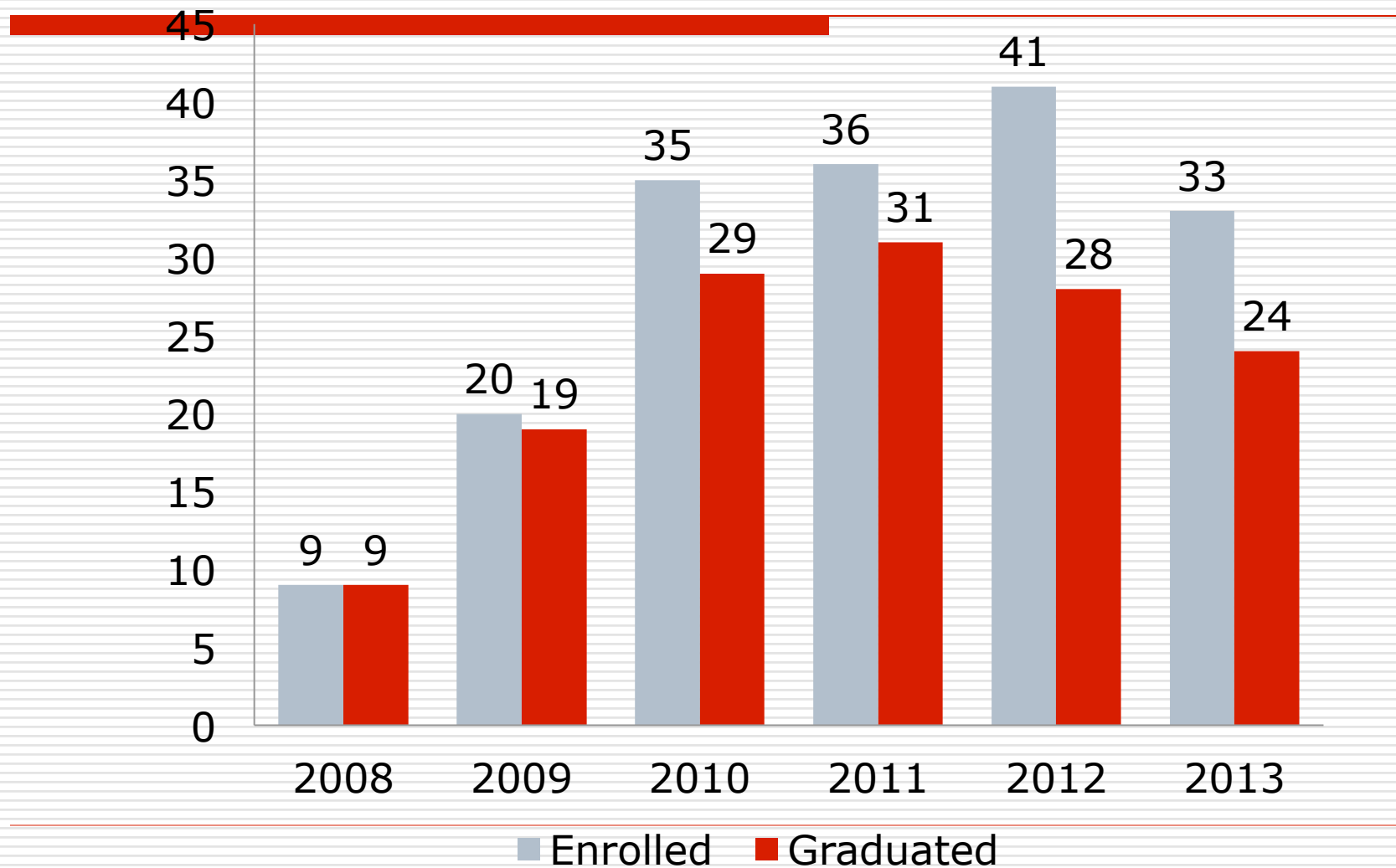
III CYCLE

- Geodesy
-

Dynamics of students and graduates for specialty Geodesy, Topography and Cartography from 2008-2013



Dynamics of students and graduates for Master program «Cadastre and Real Estate Development» from 2008-2013



DEVELOPMENT OF NEW CURRICULA...

**Business environment
involvement in education**



**Using new educational
methods and resources**



**Motivating students by
providing their employment**



Ministerul Educației al Republicii Moldova
Universitatea Tehnică a Moldovei
Facultatea Cadastru, Geodezie și Construcții

PLANUL DE ÎNVĂȚĂMÂNT
pentru ciclul I (studii superioare de licență)

Domeniul general de studii: **58 - Arhitectură și Construcții**
Domeniul de formare profesională: **584 - Cadastru și organizarea teritoriului**
Specialitatea: **584.2 - Geodezie, topografie și cartografie**
Numărul total de credite de studiu: **240**
Titlul obținut la finele studiilor: **inginer licențiat**
Baza admiterii: **Studii liceale, studii medii de specialitate și studii superioare**
Învățământ cu frecvență la zi

DISCIPLINES...

Topography,
Geodesy ellipsoidal, physical,
GNSS ON GNSS-RELATED GEODETIC
INFRASTRUCTURES, MOBILE IT AND PRECISE
NAVIGATION TECHNOLOGIES,
Geoinformatics,
Photogrammetry,
Remote Sensing,
Cadastre,
Engineering Surveying ,
Survey,
GIS,
Cartography

E-LEARNING PROCESS...

Firefox E-Learning UTM

elearning.utm.md/moodle/?lang=en

translate

UTM

moodle

CRUN

You are logged in as Livia Nistor-Lopatenco (Logout)

English (en)

Home

Navigation

- Home
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 - My profile
 - My courses

Main menu

- Site news

Settings

- Front page settings
 - Question bank
- My profile settings
 - Edit profile
 - Change password
 - Messaging
 - Blogs
- Site administration
 - Users
 - Courses
 - Grades

Site news

Subscribe to this forum

Chestionare calitate curs online
by Secieru Nicolae - Wednesday, 5 June 2013, 7:58 PM

Model chestionar curs.xls

Creatorii de cursuri, care necesita chestionarea studentilor pentru a aprecia calitatea cursului puteti accesa mai jos modelul de chestionar.

Un exemplu de aplicare a chestionarului puteti vedea la cursul "Conversia energie" din categoria "Cursuri in dezvoltare".

In caz de probleme apelati la ajutor.

Discuss this topic (2 replies so far)

Ghidul studentului pe platforma Moodle
by Secieru Nicolae - Saturday, 19 January 2013, 4:34 PM

Ghid student.pdf

Chidul studentului pe platforma Moodle poate fi accesat aici.

Ghidul creatorilor de curs
by Secieru Nicolae - Saturday, 19 January 2013, 4:31 PM

ghid creator.pdf

Ghidul creatorului de curs poate fi accesat de aici.

Elearning UTM site ...

Calendar

September 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Community finder

Search

Upcoming events

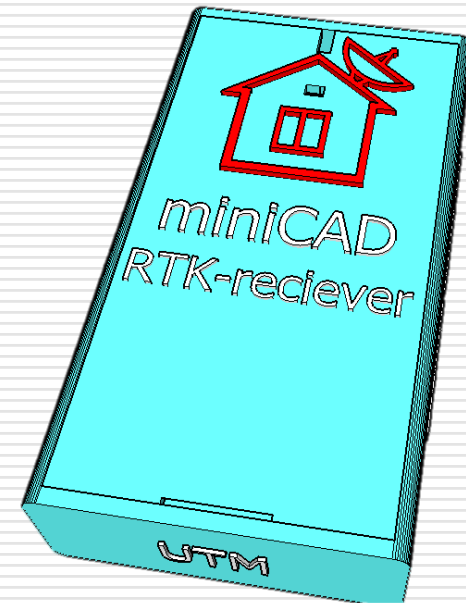
There are no upcoming events
Go to calendar...
New event...

Messages

No messages waiting

CADASTRAL WORKS EXECUTED MINICAD VIA SMARTPHONES

- ❑ Collecting data on global positioning systems GPS / GLONASS and augmentation systems
- ❑ Defining an inductive data analysis algorithm on the basis of the main indicators
- ❑ Determination of coordinates of points using Smartphone with an higher accuracy
- ❑ Creating software and deciphering navigating code received by the prototype receiver
- ❑ Connect the receiver to SBAS augmentation systems



STAGES OF WORK ...

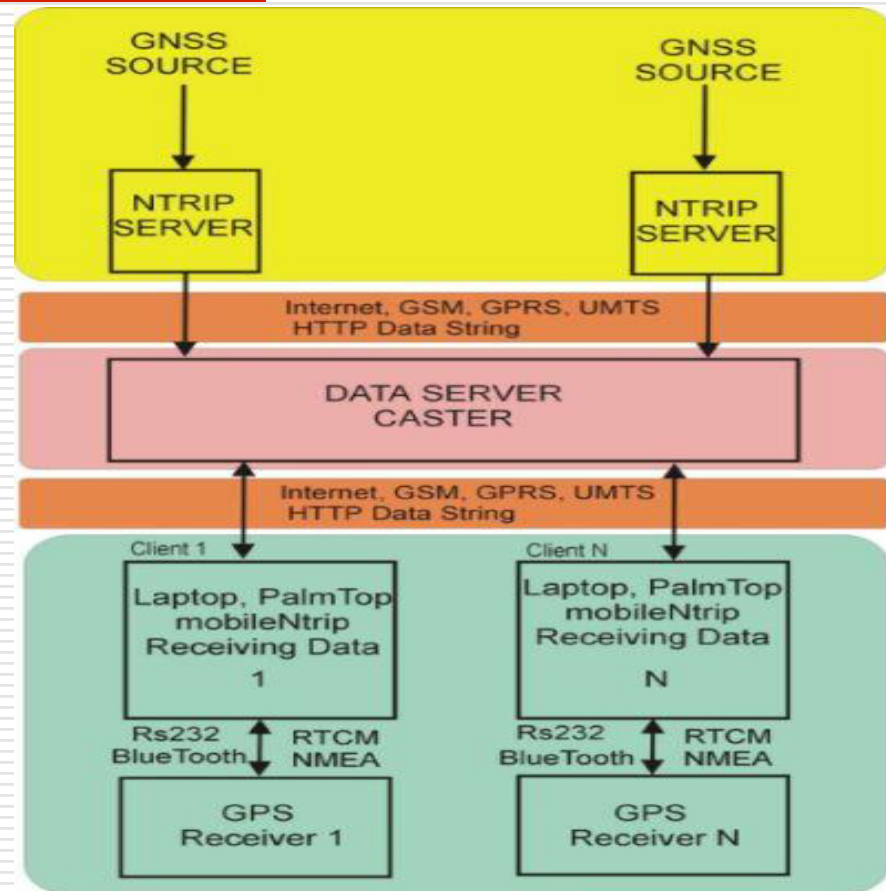
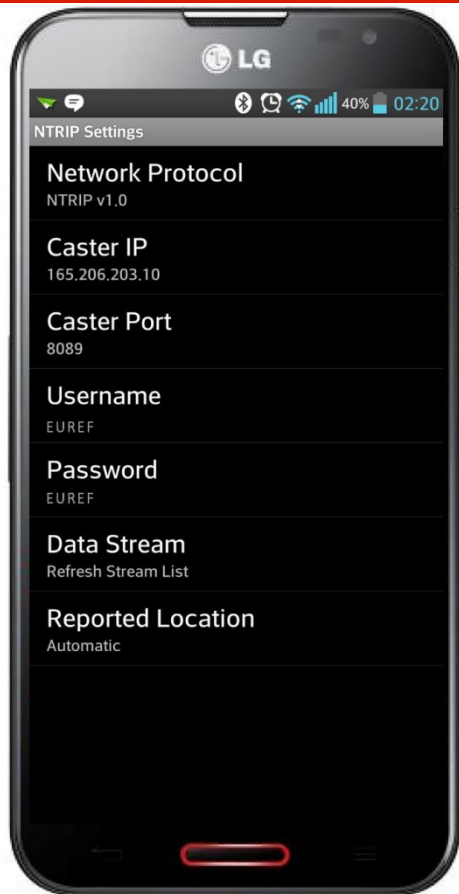
- ❑ Collection of data is to capture the signals emitted by the satellites (in the frequency bands L1C, L2C and L5) with the help of a prototype receiver and receiving corrections from the SBAS augmentation systems
 - ❑ Data analysis which includes the study of navigation message aggregation or segregation of the data depending on the need of required accuracy imposed on the type of works or frequency of the phenomenon.
 - ❑ Creating software includes a programming language and operating system, Windows or Android
 - ❑ Receptor signal transmission to the EUPOS permanent stations and receiving corrections from them, with this stage ends the realization of cadastral measurements using Smartphone and MiniCad.
-

CONNECTION TO EUREF PERMANENT STATIONS ...

- ❑ In order for Smartphones to have the capacity to access EUREF permanent stations, there was made a research in the field of programming.
- ❑ As an operating system Android was chosen because of prevailing market weight.
- ❑ In the app has been made option to obtain data correction.
- ❑ Due to the platform and technical parameters of smartphones has been used an helpful antenna manufactured by GARMIN for improving the properties of signal reception, and the universality of the final product.



The example of connection of the app to EUREF services and the operation scheme



CONNECTION TO EUREF PERMANENT STATIONS



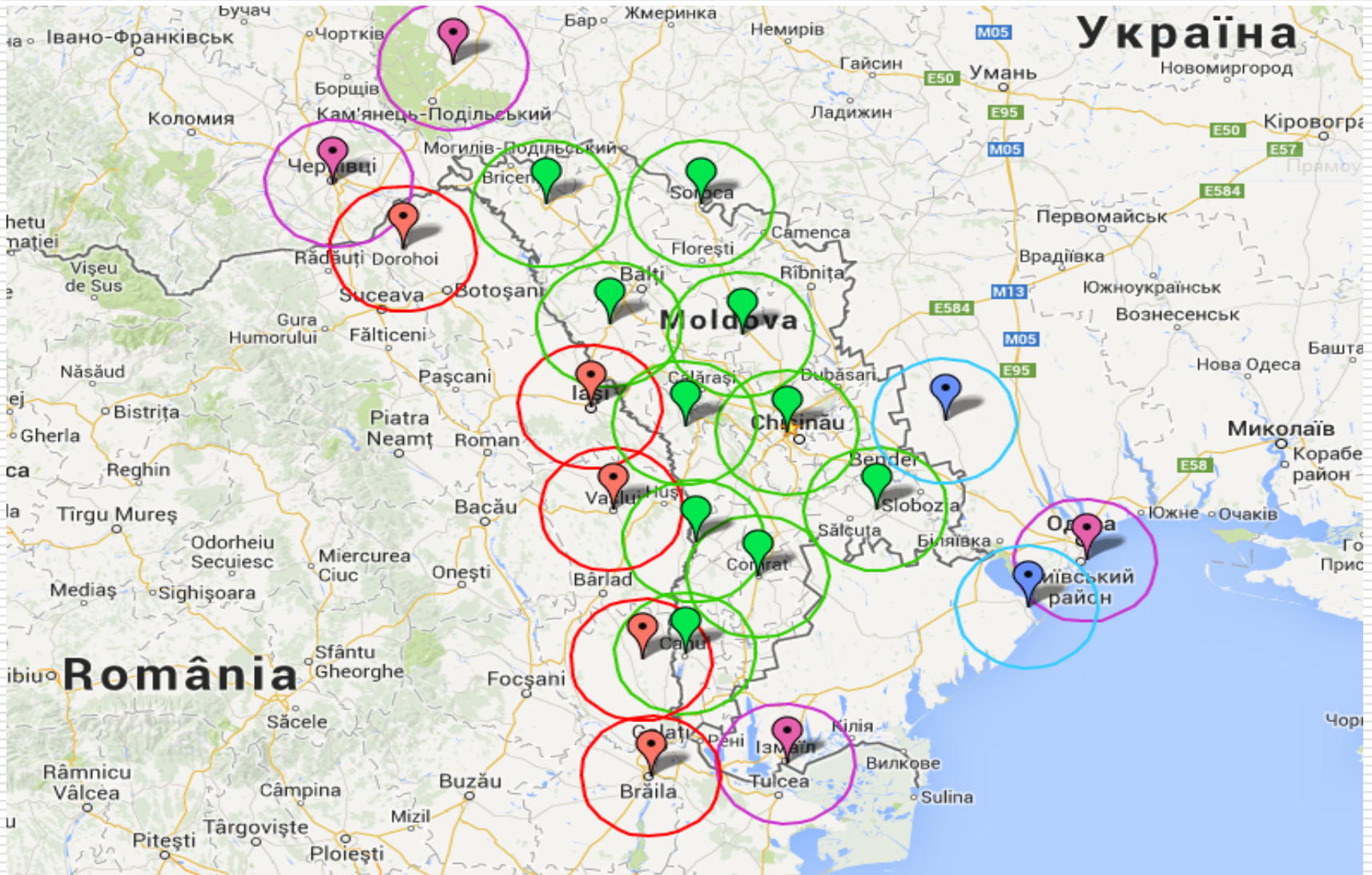
CONNECTION TO EUREF PERMANENT STATIONS ...



- As a result of tests on points with known coordinates on the faculty territory was estimated positioning accuracy of 30-40 cm, this tolerance is sufficient according to perform cadastral works outside town.

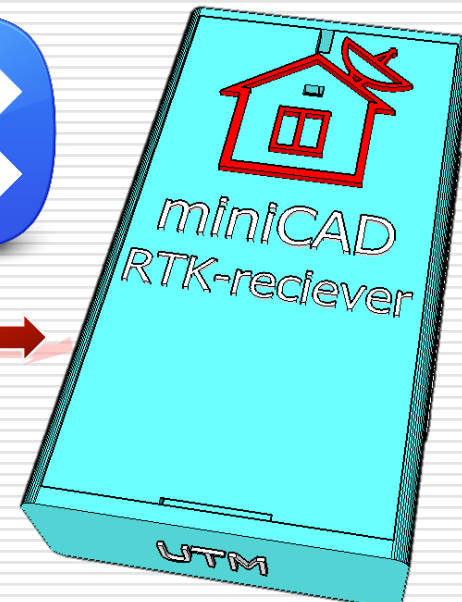
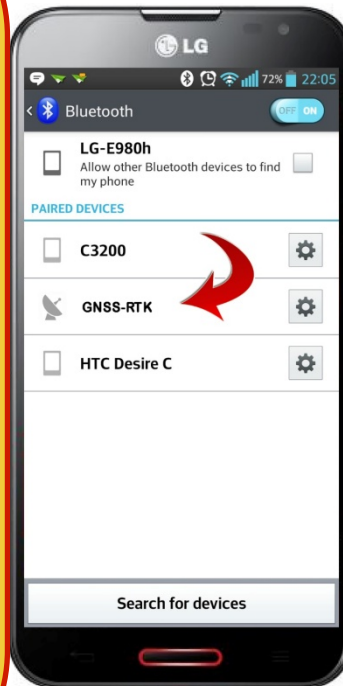
GNSS-GTC App interface

THE MOLDPOS SYSTEM ...

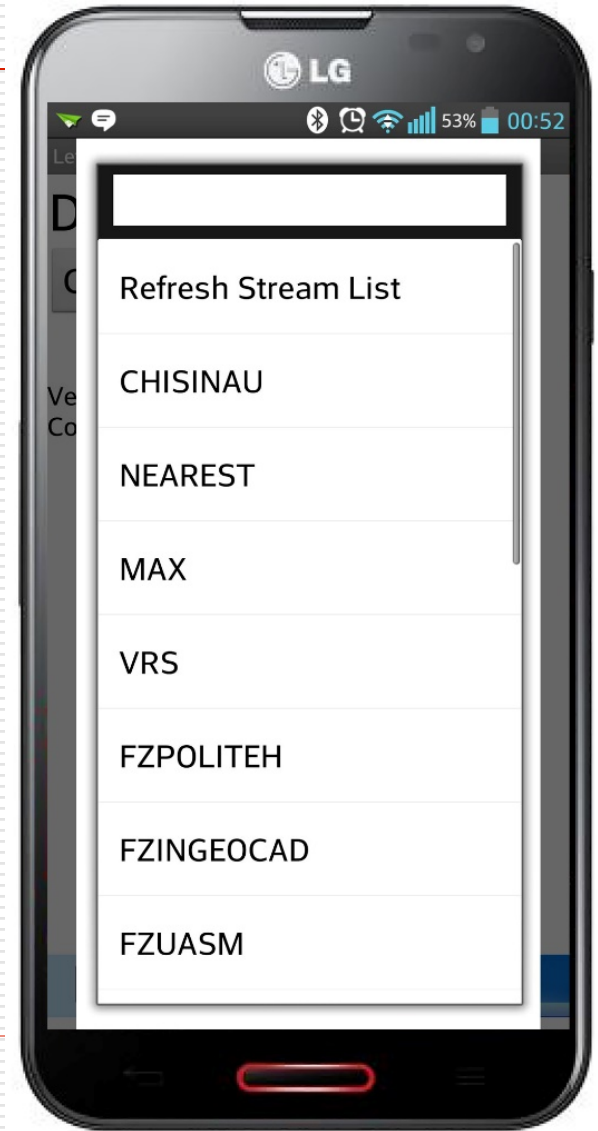
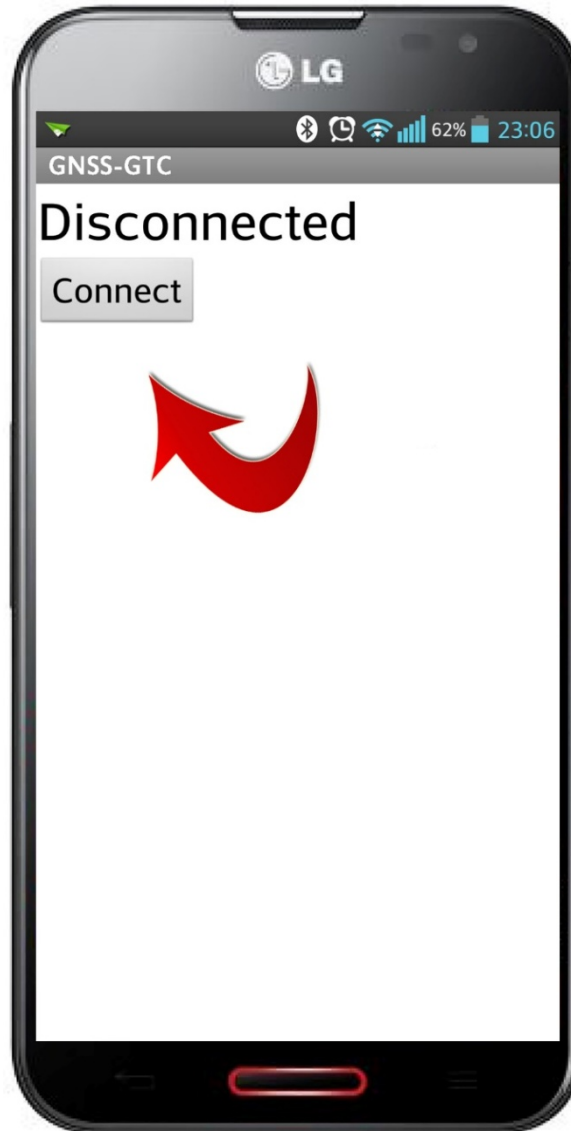


CONNECTION TO MOLDPOS PERMANENT STATIONS ...

- In order for small precision devices such as smartphones to have the ability to connect to MoldPos permanent stations, there was made a research in the field of programming.
- As an operating system Android was chosen because of prevailing market weight.
- In the app has been made option to obtain data correction.
- Due to the platform and technical parameters of smartphones has been used a GPS / GLONASS receiver developed in the thesis of improvement of signal reception properties, and the universality of the final product.



CONNECTION TO MOLDPOS PERMANENT STATIONS ...



CONNECTION TO MOLDPOS PERMANENT STATIONS ...



GNSS-GTC App interface

- As a result of tests on points with known coordinates on the faculty territory was estimated positioning accuracy of up to 20 cm, this tolerance is sufficient according to perform cadastral works in town.

SWOT ANALYSIS ...

☐ The strong points :

- Very small size, do not take up much space on transport or storage.
- Provides high accuracy in a fast time

☐ The weak points :

- Internet is required for access.

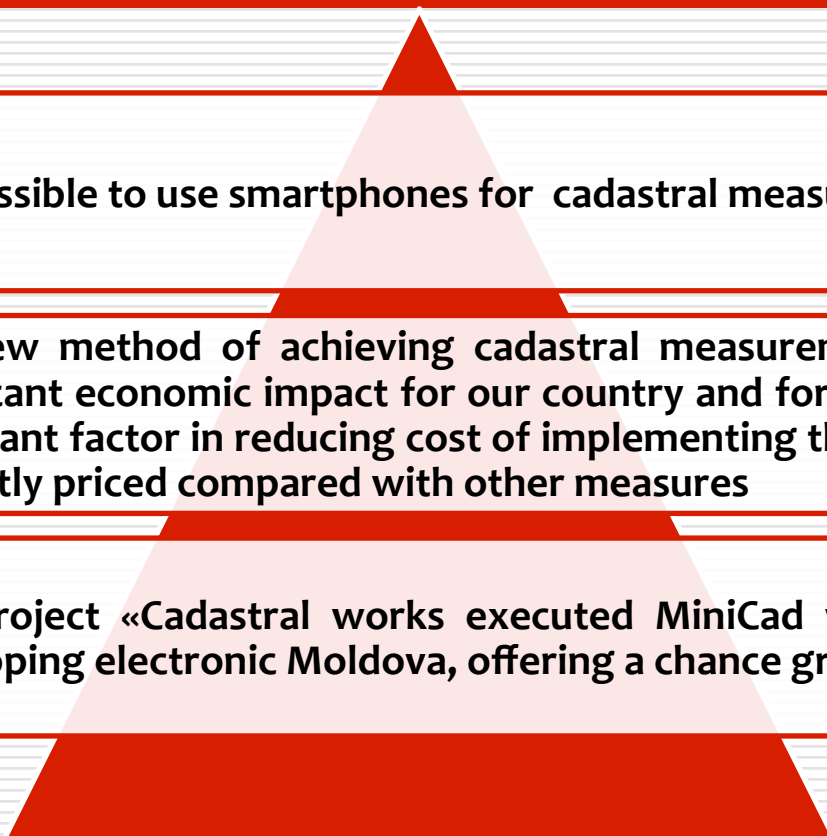
☐ Opportunities:

- Installation in each car / vehicle to monitor its activity.
- Offering much better corrected by EUREF project

☐ Threats:

- Disappearance from the market of the EUREF system.
-

CONCLUSIONS ...



It is possible to use smartphones for cadastral measurement.

The new method of achieving cadastral measurements via smartphones will have a significant economic impact for our country and for those in developing countries, is an important factor in reducing cost of implementing the cadastral measurements, which is modestly priced compared with other measures

The project «Cadastral works executed MiniCad via smartphones» is a new step in developing electronic Moldova, offering a chance gratitude country worldwide.

CONCLUSIONS ...

It is necessary to continue transforming Moldova into a modern European country

THANK YOU FOR ATTENTION!

For more information please visit:

www.utm.md

Email: nistor.livia@gmail.com

