

Innovative Technologies of Automated Training of Using Technology GPS-GLONASS for Surveyors

Ass. Prof. Sergey ATAMANOV and Ass. Prof. Sergey GRIGORYEV, Russia

Key words: key word 1, key word 2

SUMMARY

Nowadays the use of satellite technology to determine the coordinates of real estate became more topical. The development of satellite positioning system GLONASS in Russia is aimed at increasing the efficiency of various tasks, including real estate cadastre. However, many surveyors are not trained to use GPS-GLONASS technology. The considered simulator enables automated remote training of surveyors to simulate the environment and satellite surveying equipment.

SUMMARY

В современных условиях использование спутниковых технологий при определении координат характерных точек объектов недвижимости является все более актуальным. Развитие системы спутникового позиционирования ГЛОНАСС в России направлено на повышение эффективности выполнения различных работ, в том числе и кадастровых. Однако многие кадастровые инженеры не обучены применению технологий GPS-ГЛОНАСС в своей деятельности. Предлагаемый эмулятор позволяет проводить автоматизированное дистанционное обучение кадастровых инженеров, моделируя окружающую среду и спутниковое геодезическое оборудование. При обучении претендентов на получение аттестата кадастрового инженера и повышения квалификации мы используем разработанный нами комплекс методических и программных средств. Разработанные сервисы в совокупности дают возможность получить знания, чтобы стать кадастровыми инженерами, а кадастровым инженерам постоянно повышать свою квалификацию, обсуждать текущие проблемы их деятельности и совместно искать решения возникающих проблем.

Innovative Technologies of Automated Training of Using Technology GPS-GLONASS for Surveyors

Ass. Prof. Sergey ATAMANOV and Ass. Prof. Sergey GRIGORYEV, Russia

State real estate cadastre is the public register that contains complex information about land parcels and buildings: location, ownership, its border settlements etc. Location and borders of real estate objects is determined by the surveying and cadastral works.

Recently in Russia new profession was adopted - Cadastral Engineer. In order information about the property fell into the inventory, the person concerned shall submit the required set of documents. Cadastral Engineer makes all surveying works and prepares juridical documents for registration in cadastre. Cadastral Engineer is a person with special education and which has passed a qualifying exam and has special certificate. The activities of cadastral engineer can be divided into two parts:

- First, specialist must be well educated in legal aspects and land law to justify real estate registration;
- Second, specialist must know technical aspects such as surveying and cadastre.

So, education of Cadastral Engineers is in high demand nowadays in Russia.

MIIGAiK trains such specialist using innovative educational methods. We use complex of methodological and software tools developed by Faculty of Economics and Land management. We provide training in both directions pointed above.

As a base it is used knowledge operations service "Neyro" (Neyro KOS) for training professional knowledge. The main purpose of the service is the creation, management and discussion of scientific, technical and legal literature on the Internet, as well as its editing and preparation for publication in print and electronic form.

Main features of the service:

- joint authorship;
- and the ability to edit the structural elements of the book "Drag-and-drop";
- online- text and tables editor, inserting pictures, import the text;
- history of editing paragraphs with the possibility of recovery;
- automatic numbering, and drawing on bibliographic standards drawings, formulas, tables to update cross-references;
- accumulation of databases of data sources with saving texts;
- indication of quotations from sources to paragraphs;
- calculation of the level of confidence in the data;
- setting access rights to the paragraphs, sections and books;
- public discussion of each paragraph;
- export of books to the generation of tables of contents, references and bibliography;
- automated filling of bibliographical descriptions using of customizable templates with preview of the result.

In addition to the above service options allows exporting the material to print copy and to create applications for mobile devices on the Apple and Android platforms.

Using service Neyro KOS we have written and published e-book "Inventory of real estate" for education and retraining specialist in the field of surveying and cadastral works. E-version of this book is available for the Apple devices. Now version for Android devices is being prepared. Educational materials are regularly updated in this book, including results of discussions in the professional social network - a Association of cadastral engineers (www.Cadastr.ru)

Site Cadastr.ru is a professional platform to discuss news and problems in the field of real estate cadastre. Its users are able to practice for the qualifying examination for the cadastral engineer's certificate, they could use online textbook and e-tests which simulating the qualifying examination.

Cadastral Engineer mainly prepares documents for real estate register. He is allowed not to carry out surveying but however, as mentioned above, Cadastral Engineer must have the necessary knowledge in the field of geodesy and surveying. The surveying using satellite positioning technology is widespread recently.

Students receive surveying skills on practical field studies using the real geodetic equipment. In addition we developed training simulator "Use of GLONASS to meet the challenges of Geodesy and Cartography."

It is designed to simulate most of the field surveying works with using satellite geodetic measurements.

The main purpose of the emulator is to enable students to perform practical work with software that simulates not only the work on the equipment and the process of post-processing data, but also the real environment.

The software allows to make:

1. choice of the location of the base station, taking into account factors of reducing the accuracy due to the presence of objects on the ground, preventing the measurement;
2. centering and leveling the tripod;
3. moving through built-up area with a mobile receiver;
4. work with the equipment:
 - a. management of the receivers;
 - b. communication between the controller and receiver, between the receivers;
 - c. configuration and management of data entry modes "static", "stop-go";
 - d. measurements in the regime of the kinematics in real time;
 - e. fixing points on the ground;
5. post-processing of data:
 - a. download of the data form receivers;
 - b. indication of base stations and input of coordinates;
 - c. compensation of errors and getting the coordinates of measured points.

As a result of this training the student receives both comprehensive knowledge and skills to work with satellite surveying equipment and became familiar with surveying technology for the cadastral purposes.

Thus, presented services which are developed in MIIGAiK in the aggregate provide an opportunity to train cadastral engineers and constantly retrain specialists to improve their qualifications, to discuss actual problems of their activities and work jointly.

REFERENCES

BIOGRAPHICAL NOTES

CONTACTS

Title Given name and family name

Ass. Prof. Sergey ATAMANOV and Ass. Prof. Sergey GRIGORYEV, Russia

Institution

Moscow State University of Geodesy and Cartography

Address

Gorokhovskiy pereulok, 4

City

Moscow

COUNTRY

Russian Federation

Tel. + 7 (499) 261 3152

Fax + 7 (499) 267 4681

Email: fut-office@miigaik.ru

Web site: <http://www.miigaik.ru>