



**Belarusian State University  
of Informatics and Radioelectronics**

R&D Department  
BSUIR, 6, P. Brovki Str., Minsk 220013, Republic of Belarus

## Announcement XXVIII International Forum on Information and Communication Technologies "TIBO-2022"

June 6 – 10, 2022  
Minsk, Belarus

### [About the exhibition](#)

TIBO-2022 is a unique platform for the exchange of advanced international experience, generation of innovative knowledge and discussion of mechanisms for introducing the latest technological trends in various spheres of the economy, society, and government management.

#### Thematic topics of the exhibition:

- modern technology trends;
- digital economy;
- infrastructural projects of informatization.

In the frames of the business program the Eurasian Digital Forum, Belarusian ICT Summit, and forum "Digital Economy" would take place. In order to support and develop young specialists' initiatives the organizers of "TIBO", on par with "Belagroprombank", would conduct an Open Public Republican Case-Competition "AGRO 4.0".

**BSUIR will showcase high-tech developments, youth projects, and educational services:**

#### 1. [Wireless environmental temperature and humidity monitoring system.](#)

The system is designed to remotely measure the environmental temperature and humidity with the help of radio-frequency identification technology of the UHF band (860...960) MHz. The system is represented by a unique hardware and software complex that includes: sensor RFID tags, RFID readers with an antenna, and original software for processing and indication of air temperature and humidity parameters in real time. Passive sensor nodes are based on inexpensive NMV2D CAB0 ISO17025 chips and a microstrip antenna. Relative humidity measurement is based on the psychrometric method. To ensure coverage of a large area, it is possible to install additional antennas and sensor nodes with their integration into a single monitoring system.

## Advantages:

- monitoring of temperature and humidity in real time;
- wireless data transfer system;
- high accuracy of temperature and humidity measurement;
- wide range of temperature measurement;
- reading range of sensor nodes exceeds the reading range of analogs twice;
- battery-free sensor tags;
- the possibility of using the monitoring system over large areas;
- the possibility to mount sensors on any surface;
- low net cost.

## About the developer

### 2. "EMC-Analyzer" - a specialized expert system for solving problems of electromagnetic compatibility in airborne and local ground systems of radio electronic equipment

EMC analysis and EMC support in local airborne and ground radioelectronic systems, generation of specifications for airborne and ground radioelectronic complexes, taking into account EMC requirements, modeling of radio reception in a complex electromagnetic environment.

## Advantages:

- significantly surpasses analogs in terms of the capability to simulate nonlinear effects in a radio receiver when operating in a complex electromagnetic environment;
- the possibility of simultaneous joint analysis of a huge number of spurious electromagnetic connections of various nature in the frequency band 0.1 MHz-40 GHz with a dynamic range of up to 300 dB;
- EMC analysis based on a system criterion that takes into account the combined effect of spurious electromagnetic connections of all types in the on-board group of RES.

## About the developer

### 3. ADFTS is an automated dual-frequency sensing system for measuring and simulating EMC parameters of radio receivers.

The device is designed for detection, identification (recognition), and measurement of the characteristics of all possible channels and the effects of a radio receiver interfered at the antenna input.

The system was tested and now it is successfully used for the design of radio receivers and systems in different wavelengths ranges, as well as for the design of components of

RF systems for various services (radar, stationary and mobile communications, radio navigation, etc.), for civil and military aviation, satellite, ship and radar systems.

**Advantages:**

informative, convenient, and effective technology for EMC testing and measuring the characteristics of radio receivers;  
compatible with devices operating in various wavelengths ranges such as HF, VHF, UHF, UHF and EHF.

**About the developer**

**4. EMC VTA - technology as well as hardware and software complex for the analysis of electromagnetic compatibility in complex territorial groupings of radio systems of various services**

Efficient and inexpensive EMC analysis for a variety of operating frequency assignments and radio site installations on the terrain, based on the augmented reality technology and half-sized modeling technique.

**Advantages:** highly objective modeling of the electromagnetic environment by using modern geoinformation systems and models of radio wave propagation recommended by the International Telecommunication Union.

**About the developer**

**5. DNA-EMC - technology and software for discrete nonlinear simulation of the behavior of radio receivers in a complex electromagnetic environment**

DNA has ultra-high computational efficiency that does not depend on the complexity of the electromagnetic environment and takes into account the main types of non-linear effects (intermodulation, blocking, cross modulation, conversion of local oscillator noise, amplitude-phase conversion, receiving side channels).

**Advantages:**

- supports wide bandwidth and high dynamic range simulations;
- allows to automatically identify sources of non-linear interference (for example, intermodulation interference).

**About the developer**

**6. GIS-RF – specialized geoinformation technology.**

Specialized geoinformation technologies and software for frequency planning of radio

systems and system design, analysis, and simulation of system-level EMP using geoinformation technologies and digital (electronic) maps of the area under research.

The software tools are used to develop complex distributed and local terrestrial radio systems for various radio services: fixed and mobile communications, radars, navigation, radio broadcasting at frequencies of 30-40 MHz.

### About the developer

## 7. EMC - a technique for analyzing electromagnetic ecology and electromagnetic safety of the population in the conditions of massive use of cellular communications

The technique allows to assess the electromagnetic ecology in densely populated areas in conditions of mass radio means use of various services; electromagnetic safety of the population during the mass use of cellular communications in the presence of an electromagnetic background formed by electromagnetic radiation from radio transmitters for various purposes, which is extremely important in the context of the intensive development of wireless services, technologies, systems, and 4G/5G mobile communication networks.

The technique was used by the State Establishment "Republican Scientific and Practical Center for Hygiene" of the Ministry of Health of the Republic of Belarus during the development of sanitary norms, rules, and hygienic standards "Hygienic requirements for the installation and use of cellular communication systems".

Original scientific results were scientifically acknowledged around the world as well as published in the leading scientific journals of the USA, Russia, and Belarus.

### About the developer

## 8. Children's educational web-portal for life safety training.

The web-portal was developed by the students of the BSUIR branch "Minsk Radio Engineering College" in order to attract the attention of children and their parents to the problem of handling fire and the death of children in fires, as well as to lower the number of emergencies that involve children and to ensure their overall safety (at home, on the street, on holidays, on the water, etc.). The portal is an adaptive and cross-platform site with educational content, quest rooms, and test tasks.

### **Advantages:**

- unique content;
- playing form of education;
- compatible with all mobile devices.

### About the developer

## 9. Telegram-bot for studying the discipline "Databases and Database Management Systems".

Telegram-bot was developed by the students of the BSUIR branch "Minsk Radio Engineering College" as a learning helper of the discipline "Databases and Database Management Systems". The program of the Telegram-bot includes: basic terms and concepts, brief theoretical information on sections of the discipline, tasks to test the acquired knowledge and mini-quests to update knowledge. The program is written in the universal language "Python". A wide range of in-built libraries allows to implement a large set of useful functions and features.

### **Advantages:**

- high performance;
- structured curriculum;
- fast, simple, secure and free service;
- easily synchronizes across all devices.

### **About the developer**

## 10. Telegram-bot for Minsk Radio Engineering College applicant.

Telegram-bot was developed by the students of the BSUIR branch "Minsk Radio Engineering College" as a college applicant helper. The telegram-bot program includes: information on the order of admission, as well as answers to the most popular questions of applicants. The program is written in the universal language "Python". A wide range of in-built libraries allows to implement a large set of useful functions and features.

### **Advantages:**

- high performance;
- fast, simple, secure and free service;
- easily synchronizes across all devices.

### **About the developer**

## 11. Distance learning system: technologies, equipment, electronic resources

Electronic interactive educational content for remote use. It can be used both as part of an e-learning system and autonomously.

BSUIR uses it to provide a distance learning model and an experimental mixed learning model.

### **About the developer**

## 12. IMS "BSUIR: University"

The system ensures the completion of the following tasks:

- drawing up curricula for specialties, curricula for groups, as well as forming a single database to ensure the management of the educational process;
- automating the work of dispatchers when scheduling training sessions in educational establishments on the basis of working curricula for specialties and curricula for groups;
- automation of management activities of educational establishments for solving problems of accounting and management of students, as well as planning and analyzing the course of the educational process.

IMS "BSUIR: University" includes the subsystems such as "Dean's office", "Schedule", "Current academic performance record book" and "Curator's record book".

### About the developer

## 13. BSUIR, Information Technology Institute, and BSUIR branch "Minsk Radio Engineering College" educational services.

The University offers educational programs at the level of secondary-professional, higher, and postgraduate education, as well as certified IT courses, retraining and advanced training programs, additional education for children and youth in the areas such as:

- IT;
- AI;
- Cyber Security;
- Nanotechnology;
- IoT;
- Game Design;
- Business Analyses;
- Radioinformatics;
- Cloud Technology;
- Digital Economy;
- medical electronics, etc.

More at:

<https://www.bsuir.by/en/>

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