



**Belarusian State University  
of Informatics and Radioelectronics**

R&D Department

BSUIR, 6, P. Brovki Str., Minsk 220013, Republic of Belarus

# Announcement

## XXVII International Exhibition TIBO-2021

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### About

TIBO-2021 is a unique platform for the exchange of advanced international experience, presentation of modern trends in the information sphere, generation of innovative knowledge and discussion of mechanisms for introducing the latest technological trends in various spheres of the economy, business and modern life.

TIBO is traditionally attended by the largest domestic and foreign manufacturers of telecommunications equipment, hardware and software, mobile and fixed-line operators, developers and suppliers of high-tech products, security systems, intelligent solutions and services for the mass and corporate segment, and cable operators.

### BSUIR will showcase high-tech developments

#### 1. Application software "ALS Expert" for the diagnosis and assessment of the voice function state (speech disorders) in patients with amyotrophic lateral sclerosis.

Mobile application focused on performing two main functions: early diagnosis of amyotrophic lateral sclerosis (hereinafter referred to as ALS) and monitoring the state of the speech apparatus of patients with ALS in dynamics.

The research procedure is performed on the basis of a test for the extended pronunciation of the vowel sound "a". The result is recorded using the app using the smartphone's built-in microphone or headset microphone. Then the analysis of the made record is started. After processing the recording, the calculated values of the acoustic parameters are displayed on the smartphone screen, which are then analyzed by the doctor.

**Features and Benefits:** the main advantages of mobile application form for diagnosing the disease, monitoring and evaluating are ease of use, no need to use complex technical equipment, and the widespread use of smartphones. Also, the mobile application does not impose strict restrictions on the place of testing and does not require it to be carried out in a specially equipped room. This allows you to test, diagnose, and monitor the patient's condition both directly by the doctor and by the patient themselves.

## 2. Application software "Ritor" for the treatment of stuttering with the help of special exercises.

Mobile application that implements original methods of eliminating the gap in the auditory circle based on audio feedback – DAF (output of the user's speech to headphones with adjustable delay) and FAF (adjustable shift in the frequency of the main tone of the user's voice). As an addition, a visual indication is used, which allows you to control the process of performing exercises.

**Features and Benefits:** ability to change the tone of the voice, which allows you to stimulate the effect of relaxing the ligaments. The person tries to adjust to his own voice, which he hears with a delay. The speech becomes continuous and smooth. Regular classes can significantly reduce stuttering and develop the habit of smooth, calm speech.

## 3. Hardware complex for protecting a personal computer against unauthorized access to information

Designed for the implementation of physical differentiated access to information stored on internal storage devices, control of the connection of external storage devices.

All functions are performed by the hardware resources of the complex, without using the resources of the personal computer.

### **Features and Benefits:**

- physical differentiation of access to non-removable media;
- control of the connection of USB devices;
- control of the integrity of the system unit of a personal computer;
- each user is assigned his own non-removable data carrier with an operating system.

## 4. Locator for detecting devices of unauthorized information collection

Purpose: detection of devices for unauthorized collection of information on resonance phenomena in their antenna systems and related filters.

It can be used when conducting search activities for the localization of radio control devices or other actuators with a radio control channel.

**Features and benefits:** the ability to identify shielded bugs in a given frequency range in real time.

## 5. Technology for fabricating screens to secure information through optical channels

Flat screens are designed for preserving information on monitors, displays and indication panels. They ensure protection of information against unauthorized collection by outsiders who are beyond the viewing angle of 10 degrees or more.

### Features and Benefits:

- reduces stress on the user's eyes by creating contrast in small text and images;
- does not distort displayed information;
- easy to install and remove; protects the display against external damage and dust.

## 6. Speech information security device "Priboi"

Designed to secure speech information through acoustic and vibration channels from the room outside the security zone.

### Features and Benefits:

The device generates masking signals such as "white noise", "speech-like signals", "white noise" + "speech-like signals", which ensures the closure of the channels of speech information leakage;

"Speech-like signals" are formed by microprocessor according to the random law and correspond to all of the formal qualities of speech (presence of formant signal characteristics, frequency of the main tone, equal to the frequency of the main tone of the masking speech, pauses between words) and can be adapted for a certain person.

## 7. "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.

### Features and Benefits:

EMC-Analyzer 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.

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

Detection, identification (recognition) and measurement of the characteristics of all possible channels and the effects of a radio receiver interfered at the antenna input.

### Features and Benefits:

The most informative, convenient and effective technology for EMC testing and measuring the characteristics of radio receivers;

Successfully used for the design of radio receivers and systems in the HF, VHF, UHF, UHF and EHF ranges, as well as 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.

## 9. EMC VTA - technology and 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 frequency assignments and radio site locations.

Use of augmented reality technology and half-sized modeling techniques.

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

## 10. 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.

DNA 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).

### Features and Benefits:

DNA supports wide bandwidth and high dynamic range simulations.

DNA allows you to automatically identify sources of non-linear interference (for example, intermodulation interference).

## 11. GIS-RF - specialized geoinformation technology

Specialized geoinformation technologies and software for the development and design of radio frequency.

### Application area:

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;

GIS-RF software tools are used to develop integrated distributed and local terrestrial radio systems for various radio services: fixed and mobile communications, radars, navigation, radio broadcasting at frequencies of 30-40 MHz using EMP criteria.

### 12. 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 one to assess the intensity of the electromagnetic background generated by radio equipment of mobile / fixed communications and other radio services.

**Features and benefits:** the technique is extremely important in the context of the intensive development of wireless services, technologies, systems and networks of 4G / 5G mobile communications.

### 13. 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.

### 14. IMS "BSUIR: University"

It is intended for 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 the University on the basis of working curricula for specialties, curricula for groups; automation of management activities of the University for solving problems of accounting and management of students, as well as planning and analyzing the course of the educational process.

#### Subsystems:

- "Dean's office".
- "Schedule".
- "Current academic performance record book".
- "Curator's record book".