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SMART-HANDLED THZ 3D RADAR WITH CLOUD INTELLIGENT TECHNOLOGY AND ARTIFICIAL INTELLIGENCE ALGORITHMS BY LEVELS OF ABSTRACTION

In the THz frequency range, there are new possibilities for inspection of closed volumes (Package Inspection), non-destructive control and the search for hidden defects (Quality Control and Identification of Hidden Defects) in composite materials, Hidden Surface Characterization, Surface Imaging (Surface Tomography of Rough Surfaces), etc. radar with complex signal structure and Cloud Intelligent processing with artificial intelligence algorithms by abstraction levels.

THz 3D Radar is the most powerful non-invasive analytical method for direct identification of material without specimen preparation. The large dimensions and complexity of mathematical processing interfered with widespread use THz 3D Radar. In the last decade, thanks to the successes in miniaturization of transmitting and receiving THz devices, the THz optics and electronics radar has become more portable and accessible to ordinary users. But it should be noted that the creation of a Smart Handheld THz 3D Radar with Cloud Intelligent technology and artificial intelligence algorithms requires versatile professionals in the field of physics, radar technology, antennas, simulation, cloud computing, telecommunications, artificial intelligence, and others. Therefore, a number of publications, mostly foreign, where the claimed technology and characteristics of radars are desirable, but far from real. The reason lies in the lack of understanding of the technology of creating THz 3D radar, the complexity of creating a cloud environment with algorithms of artificial intelligence by abstraction levels. Ukraine's peculiarity in entering into science-intensive technologies is a great experience in creating the latest technologies and lack of funding without the right to local mistake.

Today, the handheld THz 3D Radar is virtually non-existent on the market. The main technological task is to provide a quick analysis of an unknown substance and to obtain reliable results in real time. For Ukraine, the actual tasks that can be solved by a manual scanner are searches for explosives, mines and forbidden items, checking the quality of medicines,

without depressurizing ampoules, suspensions, supermarket products, and controlling human parameters of exhalation, secretion from the skin glands and so on. This requires an instantaneous response from the radar sensor and a complex analysis of the data. For more detailed analysis we use Cloud Intelligent technology with artificial intelligence algorithms. This technology uses artificial intelligence algorithms to study abstraction levels. The 3D THz radar is a touch-sensitive part of the technology of intelligent Internet environment analysis, which connects with the cloud computing environment through the 5G Internet by abstraction levels with elements of learning the sign of environmental and cloud characteristics of the subject with the definition of the most acceptable and comfortable existence in it. This is especially important for the average individual to interpret the complex results obtained from the radar sensor.

Smart-Handled radar with Cloud Intelligent technology and artificial intelligence algorithms for abstraction levels is a portable THz radar with a complex signal structure, suitable for users with any level of experience. It has a user-friendly interface that uses the features of a clear phone app. The Cloud Intelligent cloud platform allows users to share data remotely, and training algorithms for levels of artificial intelligence abstraction increase the speed and accuracy of analysis for complex cases.

Intelligent handheld THz 3D radar is the world's first THz 3D-based radar based on Cloud Intelligent with elements of artificial intelligence. This THz-Scan portable unit is fully integrated with the Android CloudIntelligent smartphone.

The THz Radar and electronic control board are a modular plug and play design that provides easy access to each component. All components are connected to a smartphone through a smart port for secure communication. The circuit board contains the main circuitry, the sources of THz radiation and the terahertz matrix. The initialization of the smart handheld THz radar is carried out with the help of the program for Android smartphones. It is both a smartphone and radar with one instant touch of the screen. Reliable access in Real-time to CloudScan Data of Cloud Platform CloudIntelligent provides either cellular or Wi-Fi.

Smart-Handled THz 3D Radar is the only portable radar based on Cloud Intelligent Technology and artificial intelligence algorithms by levels of abstraction that surpasses other radars of this class and is the perfect solution for a variety of applications.

The technology is tested at the Faculty of Computer Sciences and Cybernetics of the Kiev National Tara's Shevchenko University, the Institute of Cybernetics of Glushkov and laboratory of the Scientific-Production Enterprise "Quantor".