ABSTRACTS

### ВОПРОСЫ РАДИОЭЛЕКТРОНИКИ

### серия

### ТЕХНИКА ТЕЛЕВИДЕНИЯ

### 2017 вып. 3

*Gorbachev V. A.****,*** *Vesnin K. V.****,*** *Klimov A. V.* **Meteorological receiving statio**ns. **PP. 3-9**. Describes the development of receiving stations and processing space weather, geophysical information in JSC «Television Research Institute». Considered commercially available receiving a set of meteorological information of the «Story-MB». **Keywords**: receiving a set of meteorological information

*Umbitaliev A. A., Pyatkov V. V.* **Television systems for the preparation of space crews to the management of a transport spaceship. PP. 10–14**. Describes the development of unique television equipment used in simulators for training astronauts. The participation of JSC «Scientific Research Institute of Television» in the development and modernization of television systems used in training complexes and simulators is shown. **Keywords**: technical means of cosmonaut training, television equipment, simulator, digital television standard, digital technologies

*Fahmi Sh. S.*, *Eid M. M., Bobrovskiy A. I., Gavrilov I. A.*, *Mukalo Y. I.*, *Almahruk M., Salem A.* **Systematization of the coding algorithms control points of images. PP. 15–20.** Proposed systematization of algorithms for encoding and decoding images based on spatial-recursive method of finding control points. The criteria of evaluation and selection of algorithms of encoding images. **Keywords:** indicators, reference points, recursion

*Fahmi Sh. S., Bobrovskiy A. I.*, *Eid M. M., GavrilovI. A.*, *Mukalo Y. I.* **A linear algorithm for finding and encoding the sample points of the images. PP. 21–26.** Discusses recursive and linear algorithms for partitioning the original image into polygons (provide the reference points in the image) for further image analysis linear data structure containing data about the polygons (reference points). **Keywords**: linear encoding, the reference point of the objects, recursion, splitting.

*Borodulin**V. V.*, *Zubakin**I. A.*, *Bobrovsky**A. I*, *Eid M.*, *Berezin V. V*. **Video system-on-chip: new methods and technologies recognition.** **PP. 27–34.** The proposed method based on triangular mesh for the object recognition of images. The algorithms of learning, detection and recognition. Given the composition of the video system-on-chip for implementation of the method on the platform with integrated Cyclone V FPGA and SuperSpeed USB 3.0. The results of testing of algorithms to recognize vehicles. **Keywords:** learning, object detection image, a triangulated mesh, the recognition reference point.

*Kazantsev A. A.***Super resolution technique for inverse synthetic aper­ture radar imaging of space objects. PP. 35–43.** The technique for inverse synthetic aperture radar imaging of space objects is presented. Proposed algorithm bases on different signal processing methods combination and allows to achieve better resolution both down and cross ranges compare with traditional Range-Doppler processing. Experimental results demonstrated quality of suggested algorithm. **Keywords:** radar imaging, inverse synthetic aperture radar, super resolution, scattering characteristics, scattering mechanisms

*Mozheiko**V. I., Fissenko T. Y., Fedorov D. A.* **Increase of accuracy of target tracking in television surveillance system. PP. 44−54.** Methods of an estimation of object dynamics in target tracking are considered. Comparison of efficiency of a recursive estimation of object position on methods is executed: extended Kalman filter and unscented Kalman filter. Methods of increase of accuracy of an estimation of position are designed and investigated. **Keywords:** target tracking, nonlinear system, Kalman filtering (KF), extended KF, Unscented Filtering

*Tikhonov S. S.* **Proposals for monitoring of video transmission radio channels in the mode of adaptive frequency tuning. PP. 55–61.** The article analyzes the search conditions for video signals from an unauthorized unmanned vehicle in the adaptive frequency tuning mode. On its basis, a scientific-methodical apparatus for assessing the effectiveness of its monitoring has been developed. Graphic dependencies are obtained, which allow to evaluate the effectiveness of the planned measures for searching for signals with adaptive frequency tuning monitoring facilities. **Keywords:** adaptive frequency tuning, signal detection, monitoring of radio channels

*Dvornikov S. V.*, *Simonov A.N.*, *Bogdanovsky S. V.* **Polarization-adaptive method for processing of radio signals, determining radio-electronic means location with the unmanned aerial vehicles. PP. 62–69.** The article describes a new polarization-adaptive method processing of radio signals from unmanned aerial vehicle (UAV). The positioning accuracy assessment of radio sources based on radio signals polarization-adaptive processing, using polarization of the received radio signal as coordinate-informative parameter. **Keywords**: the coordinate-information parameter, a location, an unmanned aerial vehicle.

*Dvornikov S. V.*, *Litkevich G. U.*, *Romanenko P. G.*, *Tsarelungo A. B.*, *Dvorovoy M. O.*, *Fedorenko I. V.*, *Dombrovsky Y. A., Kuznetsova D. A.* **Empirical approach to calculation of zones of covering digital television transmitters. PP. 70–75.** An empirical approach to calculating the field strength of digital television transmitters based on the Okamura-Khata method is proposed. A comparative estimate is obtained. **Keywords**: digital television, television transmitter, field strength, Okamura-Khata method

*Dvornikov S. V.*, *Pshenichnikov A. V.*, *Rusin A. A.*, *Tsarelungo A. B.*, *Dvorovoy M. O., Litkevich G. U.* **Increase of sustainability of mobile television radio networks functioning. PP. 76–82.** The issues of development of scientific and technical proposals ensuring the stability of the functioning of radio networks of mobile television under the conditions of setting up structural interference are considered. The results of the evaluation of the developed proposals are presented. Recommendations on their practical application are formulated. **Key words**: mobile video data transmission systems, noise immunity, noise immunity, signal structures, imitation interference

*Pshenichnikov A. V.* **Theoretical principles of transformation constel­lation charts signal designs. PP. 83–88.** The paper presents the results of a study on the theoretical methods for the formation of biorthogonal signals. Models of signal structures KAM-16 are given. Theoretical positions of transformation of constellation diagrams of signal structures, which determine the increase of noise immunity of their reception, are proved. **Кeywords:** noise immunity, vector signal constellation, signal design

*Zavgorodnii D. S., Polishuk G. S.*, *Sokolskii M. N.* **Principles of design Multispectral Satellite Imaging Systems On-Board Meteor-M Satellite.
PP. 89–95.** In this article describes systems OS-100T, OS-125T, which were developed and manufactured by «LOMO» by Space Research Institute of the Russian Academy of Sciences (IKI RAN) order for Multispectral Satellite Imaging Systems medium resolution, included in scientific hardware of Meteor-M Satellite and Meteor-MP Satellite. There are some specific requirements in article needs for good optical design these systems. **Keywords:** Multispectral Satellite Imaging Systems, scanners, prism-type dichroic beam-splitter, telecentric raytrace in image space, Nyquist criterion

*Razumov A. V., Onufrey A. U.* **A model of electromagnetic radiation impact on optoelectronic devices of television systems.** **PP. 95–101.**  The article presents a model of electromagnetic radiation impact on the sensitive elements of optoelectronic devices of television systems. The probability of equipment failure is chosen as a measure of the degree of electromagnetic radiation impact on optoelectronic devices. The probability of equipment failure is calculated based on experimental data regarding electromagnetic radiation impact on the sensitive elements of optoelectronic devices and modeling of the processes of electromagnetic energy transmission to the impact object. **Keywords:** television systems, electromagnetic radiation, optoelectronic devices, sensitive element, probability of failure

*Hankov C. I*. **Method of estimating temperature of fuel elements on a common circuit Board. PP. 102–106.** The technique of calculations of maximum temperature of fuel elements of an electric circuit located on a circuit Board in a random order. This methodology is based on gradual modeling of the heat balance in the system of bodies and provides a simple but reliable estimate of the maximum temperature of fuel elements. **Keywords**: electric circuit, printed circuit Board, fuel elements, thermal conditions of electronic equipment