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METHODS OF INTERPRETATION OF DIGITAL SPACE IMAGES

Abstract
In an article written about study space images by using eyesight and automatic methods. Besides, their different each other, tasks, and themselves criteria also considered. Effects of these methods are up to their visual and visual interpretation
Key words: space images, eyesight and automatic interpretation, visual and visual interpretation, aerospace photography, biosensor, classification, lineaments, cycle equipment.

МЕТОДЫ ДЕШИФРИРОВАНИЯ ЦИФРОВЫХ КОСМИЧЕСКИХ СНИМКОВ

Аннотация
В статье речь идет о дешифрировании цифровых космических снимков, которые широко используется на основе визуальных и автоматических методов. Так же, их задачи и специфические свойства отличающихся друг от друга. А эффиктивность этих методов зависит от прямых и косвенных дешифрировочных признаков.
Ключевые слова: цифровая космическая снимка, визуальная и автоматическая дешифрирования, космогеологические исследования, биосенсор, классификация, линеаменты, кольцевые структуры, признаки яркости.

FAZOVIY TASVIRLARNI TALQINLASH USULLARI

Annotatsiya
Maqolada nigohiy va avtomatik usullar asosida keng qo'llaniladigan raqamli sun'iy yo'ldosh rasmlarini sharhlash haqida so'z boradi. Shuningdek, ularning vazifalari va o'ziga xos xususiyatlari bir-buidan farq qiladi. Va bu usullarning samaradorligi to'g'ridan-to'g'ri va bilvosita talqinlash xususiyatlariga bog'liq.
Kalit so'zlar: raqamli sun'iy yo'ldosh tasviri, vizual va avtomatik parolni ochish, kosmogeologik tadqiqotlar, biosensor, tasniflash, chiziqlar, halqali tuzilmalar, yorqinlik belgilari

Introduction. At present spatial images are widely being used to solve a number of tasks that cover almost all geological sciences. Particularly, it is used in structural geological surveys and geological imaging, tectonics, geomorphology, the study of modern geological processes, as well as in minerals such as oil and gas, ore and ore, engineering geology and hydrogeology. In general, when aerospace images were first used for research, the method of visual interpretation was first widely used and is still used today as an effective method armed with modern technologies designed for vision.

Main part. Visual interpretation using remote methods is considered the most important part of cosmogeological research because the human eye and brain have the ability to detect and analyze specific anomalies in images and subtle features in colors that are not yet understood by technical means. Hence, the most important organs of visual interpretation are the human eyes and brain. Because the eyes have the ability to analyze deeply, they are even known as part of the brain, the organ of thought, because there are many neurons with a radius of about 5 millimeters that connect the brain to the eyes and transmit electromagnetic waves. It is through the ability of the eye to see that a person receives 75-85% of visual information about the world around him, which is reflected under the influence of light rays. Therefore, it is appropriate to call the eyes "biosensors" that receive and analyze external impressions [1,2,3,4].

Visual interpretation of spatial images, as we noted above, depends on the interpreter's ability, experience, intuition, and cognitive potential, as well as mental and psycho-physical capabilities. And again, the most important basis of interpretation is logical perception. In this case, we give simple examples, that is, in the interpretive image - a color, a simple line or shape, without direct

interpretation, through logical thinking to recognize them as arable land or pastures, artificial or natural terraces, forests or gardens, and distinguish them differently can see and distinguish aspects.

The advantage of visual interpretation over automated interpretation in the field of geology using direct and indirect signs (table) is efficiency, ease, and the simultaneous rapid reception and analysis of a wide range of spatial information, as well as logical thinking and existence of intuition that are not currently available in machines.

According to some geologists, it is not necessary to have special interpretation experience, because today's rapidly evolving technical means can effectively solve any question in this area.

However, it can be said that without a geologist-expert, one should not rely too much on a computer to be able to interpret images accurately, make appropriate maps and cross-sections, or supplement them by analyzing and describing new data.

Table

Direct and indirect features used in the interpretation of cosmostructural objects (based on O.T.Zokirov)

№	For ring structures	For linears
1.	Specific boundaries, photoanomaly, color, size, geometric shape, location of seismic furnaces and deposits, relief, geobotanical indication, hydrographic systems, discontinuous faults, etc.	Certain boundaries, photoanomaly, geometric shape, relief, geobotanical indication, hydrographic systems, discontinuous faults, etc.

Traditionally, professionals who need each other's opinion and time are involved in the processing and interpretation of aerospace images to achieve the goal, namely the processing operator and the interpreting geologist who analyzes and evaluates the spatial images. However, a single specialist who mastered two tasks can perform the assigned tasks quickly, concisely and with quality, using time efficiently. This is because the process of processing spatial images, the brain's analytical and theoretical reasoning activities, as well as the goal set, are carried out in a holistic and integral way.

Nowadays, there are opportunities to modernize visual interpretation. Consequently, in order to further increase the efficiency of this method, advanced computing, measuring, magnifying or multifunctional advanced technologies are being developed and consistently applied in practice. It is natural that the creation and rational use of spatial landscapes, ecology, soil, geobotanical maps using the analysis of spectral brightness, background, hue and other characteristics of vegetation, soil cover and other indicators reflected in spatial images will further increase the efficiency of geological prospecting.

It should be noted that at present, extensive experience has been accumulated in the automatic processing and analysis of digital spatial images. Efficiency is also being achieved in the automatic interpretation of aerospace information. Nevertheless, one of the most important tasks for scientists remains to find direct and indirect signs in order to increase the robustness, robustness, and stability of the results of automatic interpretation in the changing conditions of aerospace imaging [5]. Moreover, the rapid growth of the amount of information and the growing demand for analysis and interpretation are also creating pressing problems in automatic interpretation [6]. In order to identify such problems and make the necessary changes, as well as improvements Jurkin I.G., Guk A.P., Pyatkin V.P., Asmus V.V., Yaroslavsky L.P., Gonzalez R., Wuds R., Pregg U., Kashkin V.B., Davis Sh.M. and extensive scientific research by other foreign scientists [7; 8].

Today, many methods have been developed for the method of visual interpretation. However, since this method requires consistent work and high skill by the specialist, active research is being conducted for the purpose of automatic interpretation of spatial images. However, because the automatic interpretation method is in the early stages of development, it does not always give satisfactory results [8].

Employees of the Ministry of Defense of the Russian Federation and the Institute of Mathematics and Mechanics of the Russian Academy of Sciences have developed a method of automatic interpretation of images in order to identify, classify and contour topographic objects. However, a number of factors have been identified that hinder the creation of topographic digital and electronic maps, as well as the effectiveness of the update. The main ones are: a number of interactive processes, such as contouring objects, searching for reference information, classification of images by brightness criteria, which significantly reduce labor productivity in the interpretation of topographic objects; poor adaptation of the existing automatic interpretation method when processing images and changing imaging conditions; the need for long periods (5-7 years or more than) to retrain highly qualified operator-interpreters for the purpose of automatic interpretation, etc. [9].

It should be noted that the subjective process is also involved in the visual interpretation of linears, ring structures on the Earth's surface and other bodies in the Solar system using spatial images. Automating this process can provide a unique efficiency. However, such approaches, such as the automatic detection of linear and annular structures, also lead to a number of shortcomings and deficiencies. The most important of them are: the reliability of the linears and annular structures detected as a result of automatic interpretation, the level of accuracy is not very high; limited ability to detect linear and circular structures expressed in images as weak and scattered in the process of automatic interpretation; the limitation of the integration of different and different levels of geoinformation used in the automatic interpretation and analysis of linears and ring structures, and so on. [10].

Thus, the process of fully automating thematic interpretation has not yet been successful. After all, even the most modern computer systems are unlikely to create models of the human eye and mind [5]. Nevertheless, experts are achieving significant results in creating excellent automatic interpretation methods and technologies based on spectral brightness, spatial and geometric properties, structural symbols, and other algorithmic features, as well as increasing their efficiency.

Conclusion. It is not exaggeration to say that the simultaneous movement of the eye and mind in the process of interpretation and analysis with these stereo-observation technologies really increases the quality and accuracy of visual interpretation, as well as

work productivity. Needless to say, quality interpretation is not an easy task. Poor quality interpretation does not depend on demand-level aerospace images either. Because these pictures are a copy of nature that reflects the existence, reality and existing reality. Therefore, the ability to think, see, and perceive quickly, visual memory, visual analysis, and optical gaze are the highest gifts given to man, and are the main factor that distinguishes him from artificial and supernatural intellectual machines.

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