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Digital museum collection to maintain heritage in planetary research

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1. Introduction

The most part of fundamental knowledge about planetary bodies is obtained by means of remote sensing. The most part of historical remote sensing data and results of their processing was in analogue form. To make it accessible and useful in modern world we need to bring them to proper formats. That is why we aim to create a digital collection of the available historic materials in the field of planetary studies and mapping. It is planned to use GIS techniques for cartographic products and organize web access to all data.

2. Digital museum collection

An example of similar project, is the NASA Regional Planetary Image Facility (RPIF), where photographic and digital data, including photographs and maps, as well as mission documentation, are presented (https://www.lpi.usra.edu/library/RPIF). These libraries, located in the US and some other countries, not only store the results of space research, but also carry out educational activities and popularize space science.

Our approach is aimed to the formation of an digital collection of planetary data as an information and technological support for the educational and scientific activities of the MIIGAiK Educational and Historical Center (http://www.miigaik.ru/sveden/unique/muzeum/), whose main tasks in terms of education problems are:

- to increase the level of professional knowledge;
- to enlarge training resources, including remote sources;
- expansion of the educational base with new archival and documentary materials;
- to increase interest in specialized studies.

For these purposes, we plan development of various instruments, including the possibility of 3D-modeling and processing of spatial information, of thematic online mapping, intellectual search and retrieving data, and tools for online communication and web-conferencing [1].

As information and technological support of the proposed interactive collection, it is planned to use the MIIGAiK Planetary Data Geoportal, which supports modern GIS and Internet technologies, providing cartographic visualization and access to planetary data online in an interactive mode (http://cartsrv.mexlab.ru/geoportal).

Modern technologies have already given new life to some archive data. Scanning of original Lunokhod films made it possible to perform computer processing of panoramic images of the lunar surface (Fig. 1) and bring them to a view convenient both for amateurs in astronomy and formats supported by the software products adopted in the scientific community.

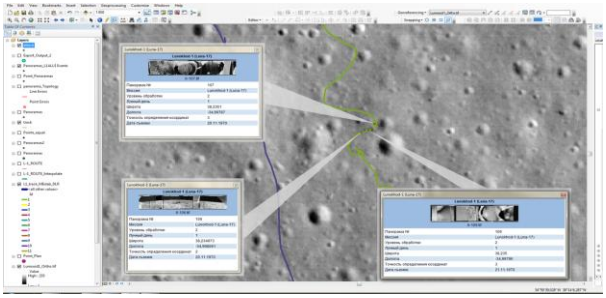

Figure 1: Example of student's GIS project for processing and visualization of archive Lunokhod panoramic images.

The combination of archival information with the data of the modern remote sensing of the Moon made it possible not only to clarify the routes of the Lunokhods [2], but also to partially reconstruct the information about the places of shooting of the lunar

panoramas, which was considered lost [3]. Thus, the results of modern processing of archival lunar panoramas are already available on the MIIGAiK Planetary Data Geoportal. It is important to note that modern technologies make it possible to provide the coordinated consistency of archival cartographic materials with data obtained by planetary rovers, which makes it possible to integrate the latest and historical materials in a single environment.

In addition, geoinformation software helps to prepare visual materials and teaching aids in the form of maps and GIS projects that reflect both general information about the lunar surface and allow to highlight and pay attention to particular features of the territories, details of the relief or historical facts. Such maps can be used for classes in schools, seminars, workshops, at planetariums, interactive museums, and GIS projects - in training specialists (Fig. 2).

Figure 2: The driver of Lunokhods – V.G. Dovgan – at a seminar with students and young scientists, who prepared the new maps of Lunokhods routes.

3. Summary and Conclusions

The digital museum collection, developed as a pilot project on the history of space exploration by geodetic and cartographic methods, will be further expanded with exhibits from other museum expositions, thereby forming an interactive museum with web access that will be a useful tool not only for researchers but also used in as an educational material for a wide range of interested in space exploration people.

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