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IMAGERY PROCESSING SYSTEM AND ITS APPLICATIONS

N.V. KULKOV AND V.P. PYATKIN

Computing Center, USSR

The existing disproportion between high efficiency of imagery receipt process and low productivity of the ways of their processing makes actual the creation of an Imagery Processing System, which may be used for the estimation of the efficiency of new hardware and mathematical methods of picture processing.

The main idea of hardware functional organization is compatibility of special purpose processors and input/output image units with a base computing system in external memory on the disks and tapes level.

The base computing system includes three BESM-6 computers with the total external memory field on the disks. The terminal computer (minicomputer M-6000) serving specialized input-output image (phototelegraphic unit "NEVA", System P-1700 photomation MARK-II, direct input channel, etc.) is connected with the base computing system.

The software of Imagery Processing System includes system programs and functional processing programs. The system programs serve general structure of the system, providing the connection of a user with this system, the image input-output operations, the general control of image processing, the error search and logging, dynamic allocation memory, the maintenance of interface demands of the system, etc.

The functional processing programs of the system are based on modular design. The program modules are arranged in the application program pack. The main part of the programs is related to the program pack of preprocessing, which is a pre-processor for all the other application program packs, since it has the program modules connected with the presentation of pictorial information and storage of it in the system (image registration, reformatting, enhancement, filtering, edge detection, geometric rectification, etc).

Specialists of nature control institutes of the Siberian Branch of the USSR Academy of Sciences, who are the main users of Imagery Processing System, should play the leading role in the creation of special program packs.

The main topics of application research are connected with the study of geological structure of the earth, mineral exploration, timber inventories, fire control, the mapping of agricultural regions of Siberia, environmental impact analysis, crop identification, environmental protection, etc.

The theory of inverse problems of mathematical physics is important for remote sensing method. Mathematical statements of inverse problems arise in interpretation of multispectral scanner data.

They are mathematical methods of inverse problems, that to all appearance, will come up to take place of widespread correlation method in imagery interpretation.

The inverse problems, in particular, the inverse optic problems, are one of the main topics in research work of the Computing Center.