Moscow State University of Geodesy and Cartography (MIIGAiK)
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PHOTOMOD – A STANDALONE SOFTWARE SYSTEM FOR PLANETARY IMAGE ANALYSIS

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«PHOTOMOD» is a digital photogrammetrical software for the Earth images processing and DTM, orthophotoimages and mosaics development.
In 2011 the «PHOTOMOD» software has been up-graded for the possibilities of the planetary images to be processed and 3-D models developing. The upgraded software «PHOTOMOD» are testing at MIIGAIK Extraterrestrial Laboratory and can be used for tiepoint measurements, bundle block adjust-ment, mosaic and orthophotoimages preparing, con-trol point measurements and images analysis for pla-netary bodies of the Solar System.

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BATCH LOADING OF PUSH-BROOM SCANNER IMAGES TO A PROJECT WITH AUTOMATICALLY READING GEOREFERENCE DATA, INTERIOR AND EXTERIOR ORIENTATION PARAMETERS

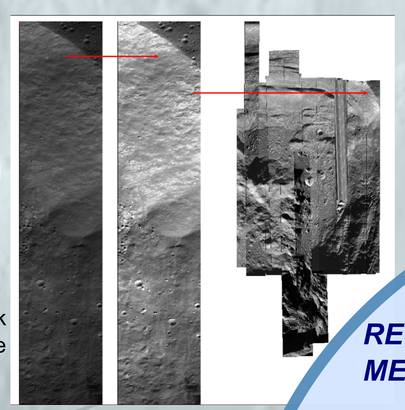
By means PHOTOMOD software the following processes can be performed automatically:

reading of image metadata

computation overlapping areas of images as well as deviation angle from nadir

color depth estimation of images (8-16 bit/pixel)

Additional “pyramid” files are created for quick preview of images - it would take some time for file opening but further work with image will be faster.



LROC NAC images

MOSAIC PRODUCING IN SEVERAL SECONDS

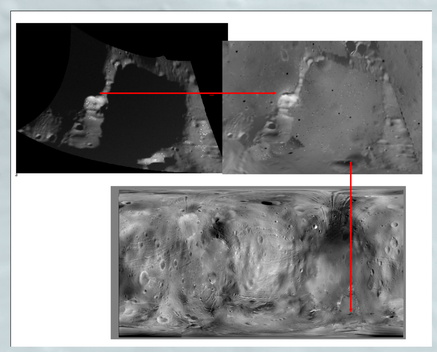
Possibility to construct of any projection

Automatic brightness balancing is performed with a single click

Creating of automatic image region of interest (ROI)

Brightness balancing ignoring some areas (for example, shaded crater floors or shade from mountains)

Preliminary preview of a mosaic on all stages of mosaicking



Global mosaic of Phobos: an example of transparent cutlines applying

Transparent cutlines for excluding shaded areas to fill shaded areas by images with a better illumination condition

RESULTS OF SMALL BODIES STUDY BY MEANS PHOTOMOD SOFTWARE

- Control Point Network for Phobos, Io, Enceladus with improved accuracy

- Observation of the forced libration amplitude for Phobos

- DEM with breaklines for Phobos, for some regions of Enceladus and detailed DTM of lunar surface from LROC NAC images

- Orthomosaics of Io, Phobos, Enceladus and interesting Lunar region (Lunokhod-1,2 landing sites) with global brightness adjustment

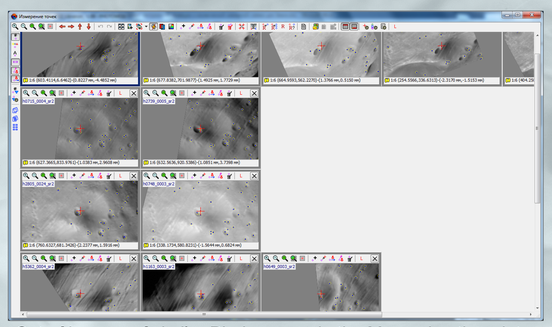
AUTOMATIC TRIANGULATION (IMAGES AUTOCORRELATION) FOR BLOCKS OF PUSH-BROOM SCANNER IMAGES AND BUNDLE-BLOCK ADJUSTMENTS

Automatic identification of tie-points using preliminary exterior orientation and overlapping areas with sub-pixel accuracy

Indication of a camera name and a deviation angle from nadir for every image to exclude mono images from triangulation

Loading of more than 100 images for control of mean residuals of points

Visualization of tie errors vectors in the Measuring tie points window for control of misidentified measurements



Set of images of similar Phobos area in the Measuring tie points window

DTM AND DEM GENERATION USING AUTOMATIC CORRELATION IN THE NODES OF REGULAR GRID AS WELL AS EASY-TO-USE EDIT TOOLS IN THE MANUAL MODE

Parameters preset of automatic identification of surface points.

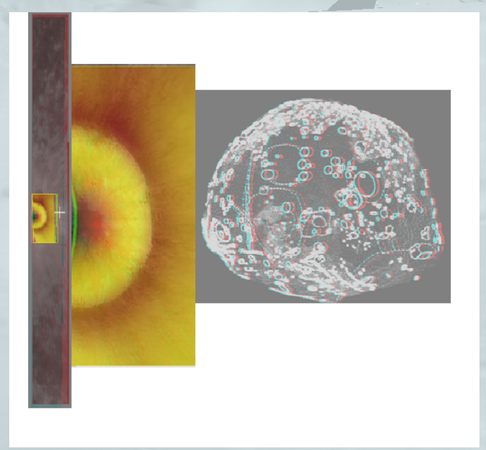
Loading of preliminary DEM allows to search identical points faster.

Manual generation of vector objects on the entire area of stereo pair in stereo mode.

Compiling of stereo pairs based on only exterior orientation data.

Tools of filtration of misidentified points measured by means automatic correlation.

Export to common used formats of images, DEM, DTM.



Elevation matrix for lunar crater and DEM with breaklines for Phobos

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