

# PE&RS

Photogrammetric Engineering Remote Sensing

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Number 1

**AMOEBAs Clustering Revisited**

By using the method, one can avoid many tedious hours of image analysis. The method is suitable for images of any size and dimensionality.

*Jack Bryant* .....41

**Techniques for Noise Removal and Registration of TMS DATA**

A heuristic approach to designing noise filters for removing high- and low-spatial frequency striping and banding, and techniques for registering thermal infrared aircraft data to a topographic base using Thematic Mapper Data, are presented.

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**Optimum Band Selection for Supervised Classification of Multispectral Data**

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**A New Statistical Approach for Texture Analysis**

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**The Use of Structural Information for Improving Land-Cover Classification Accuracies at the Rural-Urban Fringe**

Inclusion of an edge-density image improved the accuracy of supervised classification from 76.6 percent to 86.1 percent.

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**A Multisensor Approach to Sea Ice Classification for the Validation of DMSP-SSM/I Passive Microwave Derived Sea Ice Products**

Merged data sets of passive microwave, Landsat, and AVHRR imagery are used for the validation of SSM/I ice concentration products.

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**Mineral Mapping at Cuprite, Nevada with a 63-Channel Imaging Spectrometer**

Identification of individual minerals and spatial display of the dominant mineralogy using the imaging spectrometer data adds information that can be used in determining the morphology and genetic origin of the district.

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**Spatial Resolution Requirements for Automated Cartographic Road Extraction**

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**PE&RS**

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COVER PHOTO: Jerusalem, Israel, was imaged by the Landsat Thematic Mapper on April 1, 1987 and by the SPOT satellite on April 8, 1987. The satellite data are presented in four formats. The outer area shows 30-m resolution Landsat data as natural color (TM 1, 2, 3, as blue, green, and red respectively). A false color composite adjoins this (TM 5, 3, 4 as blue, green, red). Next are SPOT panchromatic data, at 10-m resolution. The central rectangle displays a combination of the SPOT (1-band), and Landsat (5-bands) images. The image represents an area approximately 16 \* 20 km, and is part of a 30 \* 30 km color poster, marketed by Heralds of Zion Publications Inc. of Vancouver, Canada. Produced by G.F. Tomlins, B.C. Research Corporation, Vancouver, Canada. Image derived from data processed for Herald of Zion Publications, Inc., Vancouver. ©Herald of Zion, (1988): SPOT image, ©CNES (1987): Landsat image ©Eosat (1987)

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ASPRS has adopted the following definition: *Photogrammetry and Remote Sensing* are "the art, science, and technology of obtaining reliable information about physical objects and the environment, through the process of recording, measuring, and interpreting imagery and digital representations of energy patterns derived from noncontact sensor systems."

*Conventional photogrammetry* includes the compilation of *topographic maps* and surveys, complete with contour lines, based on measurements and information obtained from aerial and space photographs with optical analog instruments and/or analytic instruments/computations. Similar topographic principles of *precision measurement* are applied in *close-range photogrammetry*, to map (measure) objects that are difficult to study in other ways, such as the shape of an astronomic radio reflector subject to environmental deformations, for synoptically recording measur-

able deformations in engineering models, for the medical study (in situ) of live specimens, etc.

*Remote sensing* uses imagery acquired with a sensor other than (or in addition to) a conventional camera, such as by electronic scanning, or using electromagnetic radiations outside the normal visual range of the film and camera - microwave, radar, thermal infrared, and ultraviolet, as well as multispectral. Special techniques are applied to process and interpret remote-sensing imagery for the purpose of producing conventional maps, thematic maps, resource maps, digital data files for GIS, surveys, etc., applications in the fields of agriculture, archaeology, forestry, geography, environmental sciences, geology, and others.

*Geographic information systems* are the computer hardware/software used to input, store/retrieve, manipulate/analyze, display, and plot/print spatially referenced digital data (e.g. digitized maps, remote sensor, tabular data, etc.). Thus a GIS is comprised of three essential subcomponents: computer hardware, computer software, and various types of digital data.

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