DIMPLE - Get closer to your image

The availability of more powerful personal computers in recent years means that image processing capability can now be at the fingertips of every earth scientist. And with the wide availability of remotely-sensed data particularly on CD-ROM, there has never been a better time for earth scientists to consider setting up their own image analysis system.

Now, for the first time, an unprecedented array of image processing tools is brought to the Mac platform in DIMPLE. From data import through enhancement, transformation and analysis to data export, DIMPLE has all the features and power of traditional packages while offering an intuitive graphical user-interface that makes image analysis fast and easy. If you work with remotely sensed images, you need DIMPLE, the No. 1 image processing package for earth scientists.

DIMPLE gives you everything you need to make sense of your images. It provides the most powerful tools for multispectral analyses available on the Mac, allowing you to work with images of up to 32,000 channels. DIMPLE can handle image data in all common file formats, allowing you to import data from almost any source. You can also export data and graphics to other applications such as GIS systems as well as standard office software like word processors which are readily available on the Mac.

DIMPLE's impressive range of presentation tools provide superior flexibility in the way you display your data, while comprehensive image processing techniques help you quickly get your data ready for presentation. And to ensure that you get everything you need from DIMPLE, the simple-to-use Image Operation Language (IOL) lets you develop your own new image processing operations to tailor DIMPLE exactly to the needs of your application.

What makes DIMPLE the best remote sensing system on the Mac ?

Communicative

Bring all your images into DIMPLE

DIMPLE can read most common file formats and a generic “foreign” format is also included to catch all those that you wouldn't want to miss. Vector images aren’t neglected (DXF or PICT) and multiple vector images can be overlaid on a raster image. You can draw the vectors in any colour and order and add a map grid as well.

DIMPLE runs in 256, thousands, or millions of colour modes and you can work with 8-bit pixel images and 16- or 24-bit direct colour images. If you're working with images larger than your Mac's memory, DIMPLE takes care of things by allowing you to process images straight from the disk. You can export data to other applications such as word processing, drawing, spreadsheet and presentation packages, and of course your GIS application.

Great Geometry

DIMPLE's registration, rectification and resampling features are second to none

DIMPLE is outstanding when it comes to image registration and rectification. You can correct geometric distortion, and register an image to another image or any co-ordinate system.

Rectification can be performed using standard mathematical transformations, such as rotation, skew, reflection, aspect ratio, correction for earth rotation, or other arbitrary affine models.

Registering an image to a map grid is easy. Select Ground Control Points (GCPs) with mouse clicks, and specify their co-ordinates in the grid system. DIMPLE helps you check if they’re correct, and identify any outliers. All major grid systems are supported and if you need something different you can define your own.

Image-to-image registration is similarly effortless. Match the GCPs of a slave image to Relative Control Points (RCPs) on a master image. To find an RCP, select a search area, and DIMPLE finds it for you.

You can use nearest-neighbour resampling to produce transformed images for later analysis, and bilinear interpolation or cubic convolution for producing images for visual interpretation. The bounds of the registered image can be specified in pixel or registered co-ordinates.

Once you have registered an image, DIMPLE allows you to specify the bounds for other operations in registered co-ordinates. It also displays the registered co-ordinates as you move the mouse over the image, and you can measure area and distance in pixels, yards or metres. And to broaden your horizons, registered images can be joined together to form image mosaics.

Multi-talented

As many channels as you need for multispectral analysis

You can work with multispectral images containing up to 32,000 channels, easily managed via the Multiband Window. These can include raster data, vector data, synthetic channels and results of multispectral operations such as classifications or RGB composites. You can even give individual channels meaningful names (e.g. “near IR”, “LANDSAT band 3”, “digital terrain”). Channels can easily be selected for use in multispectral functions such as classification and principal components.

In a class of its own

Perform supervised and unsupervised classifications

Just to show it's in a class of its own, DIMPLE has the best techniques for classifying multispectral images. Again, it's very easy. Using the rectangle or lasso tools, you can choose either regular or irregular training areas, and make training sets. To guide you, the spectral signature of each pixel is displayed as you move the mouse across the image. Statistical and canonical variate cross plots allow you to visualize class separation effortlessly and the training set editor allows you to assign class colours, give them names and merge statistically similar classes.

Performing a supervised classification is straightforward and flexible. You can use the selection tools to specify a training set representative of an image class which can then be used to support supervised classification with a whole range of classifiers.

For unsupervised classifications use either the minimum distance or the K-means classifier. The post-classification editor allows you to assign names and colours to classes, examine statistics, and reclassify. For further analysis, you can produce post-classification reports and cross plots of training sets, image classes and canonical variates.

Image Analysis

Histograms, statistics and more

DIMPLE shows off a wide range of image analysis tools. Statistics can be collected on an arbitrary region of an image, and interactively viewed or saved in a report. The image histogram shows pixel frequency in either relative or cumulative form, and is also a powerful tool for contrast enhancement. Linear transects, showing changes in pixel values along a selected line in an image, can be produced and scaled to highlight features of special interest. The image cross plot shows correlation between two images. Not forgetting its talent for multispectral images, DIMPLE includes channel cross plots, canonical analysis, and cross plots of canonical variates.

See things in a new light

Use DIMPLE's filters or create your own

DIMPLE can enhance your images with a useful range of digital convolution filters. These include several median and low-pass filters for noise reduction, high-pass filters for local contrast enhancement and edge-detection filters such as the Laplacian. With them you can find fault lines or discontinuous regions and remove "speckle" from radar imagery. To get the true picture behind your image, you can correct radiometric or transmission distortions. If your application requires specialized filters, DIMPLE makes it easy for you to create your own.

Tools for manipulating the Colour Look-Up Table (CLUT) provide an interactive technique for performing operations such as density slicing, contrast enhancement and pseudo-colouring.

Transform your image with DIMPLE

Colour composites and 3-D surfaces

DIMPLE’s Image Transformations produce new representations of your images, bringing out features that are not apparent in the original representation. You can produce RGB, HSI or CMY colour composites in 8-bit, 16-bit or 24-bit modes. Channel assignments can quickly be adjusted and images can be separated into their colour components.

DIMPLE allows you to use principal components transformations on multispectral image channels, and generate a detailed report to assist in analysis of image correlation. You can also combine principal components with an RGB colour composite.

With DIMPLE you can generate both 3-D and contour plots. 3-D plots can be produced in either solid colour or wire-frame modes. You can interactively define the rotation

and inclination of the plot, and there is the option to drape another image over the 3-D frame. Also, contour models can be generated from height data and the contour vectors overlaid onto another image.

Customization

Give DIMPLE your own features

Not only is DIMPLE the best "ready-made" image processing system available on the Mac, it can also be your own custom-built application. The built-in Image Operation Language (IOL) allows you to define operations ranging from image difference and band ratios to complex vegetation indexes. You can also string together a series of image operations in a high-level macro-style program. Using the IOL requires no previous programming skills, and a detailed tutorial provides a step-by-step guide to learning and using the IOL. The language supports standard mathematical and scientific functions, random number generation, conditional (IF ... THEN ... ELSE) constructs, and allows you to integrate digital convolution operations. When you're ready to run them, IOL programs can be added to the DIMPLE menus and used in the same way as built-in commands.

DIMPLE - Powerful, Flexible and Friendly

- DIMPLE conforms to the standard Macintosh user interface, so it's easy to use. You can also open multiple images simultaneously in separate windows, making comparisons of images easy. All commands are available from the menus, and context-sensitive Balloon Help answers your questions quickly.
- The results of all analyses can be displayed in a comprehensive report which can then be saved, printed or exported to a spreadsheet package, or viewed interactively.
- Your own set of functions can be added to the menu, making DIMPLE your own custom-built tool box.
- For presenting your images, you can add class and vector legends and map grid overlays, and seamlessly export them to drawing applications for annotation. Editing class colours in thematic maps is fast and interactive. Images, reports and cross plots can be simply copied and pasted into other applications, so producing reports and technical papers is infinitely more straightforward, than with other systems.
- The new generation of powerful Macintosh computers means that serious image processing is no longer confined to the expensive workstation.
- The unrivalled combination of an intuitive graphical user interface with features like multispectral analysis, classification, registration and rectification make DIMPLE the best image processing solution available.

System Requirements

- A Macintosh with at least 8-bit colour and a colour monitor.
- A hard drive and a 1.44 MByte floppy disk drive.
- System 7 or later.
- Minimum 4 MBytes RAM (8 MBytes recommended).
- Maths coprocessor optional but strongly recommended.

About the Developer

Process Software is an Australian software house based in Wollongong, New South Wales, and specializing in the development of innovative technical software. DIMPLE was developed by Process Software in close consultation with leading commercial and educational users of remote sensing with the aim of making powerful analysis tools more accessible within a friendly user interface.

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We are proud to announce the release of DIMPLE v2.2 Image Processing Software for the Macintosh...

DIMPLE v 2.2 is now accelerated for your Power Macintosh! Not only does this new version perform faster, it also brings many enhancements to an already powerful package:

- Native Power Macintosh version.
- Process 16- and 24-bit images - you are now able to access colour components histograms for colour channel transformations.
- New density slicing tool.
- Histogram enhancements - piece-wise linear stretch and histogram shift.
- Support for undefined pixels.
- 16- and 24-bit direct colour images and vector images can be saved in PICT format.
- Core Apple Events supported.
- Produce grey-scale representation of any raster image.
- Improved control over gridding of custom point files.
- Interpolation for custom point files.
- Automatic scrolling of an image while selecting rectangular or line selection areas.
- Synchronised multiband scrolling.
- Highlighting of selected areas has been improved to be more visible in most cases.
- If there is not enough memory to store new image data during an operation, DIMPLE will automatically try to use a temporary work file on disk instead.
- IOL now has a new explicit Rbitwise notS operator.
- Time-saving improvements and additions have been made for the collection and manipulation of image statistics.

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