Information Technology and Software

Hierarchical Image Segmentation (HSEG)

Enhancing image processing using Earth imaging software from NASA

Hierarchical Image Segmentation (HSEG) software was originally developed to enhance and analyze images such as those taken of Earth from space by NASAs Landsat and Terra missions.

The HSEG software analyzes single band, multispectral, or hyperspectral image data and can process any image with a resolution up to 8,000 x 8,000 pixels, then group the pixels that have similar characteristics to form regions, and ultimately combines regions based on their similarity, whether adjacent or disjointed. This grouping creates spatially disjoint regions. The software is accompanied by HSEGViewer, a companion visualization and segmentation selection tool that can be used to highlight and select data points from particular regions.

BENEFITS

- Faster than competing software
- Improves analytical capabilities with increase speed over state-of-the-art
- Refined results, maximum flexibility and control
- User-friendly GUI

technology solution

THE TECHNOLOGY

Currently, HSEG software is being used by Bartron Medical Imaging as a diagnostic tool to enhance medical imagery. Bartron Medical Imaging licensed the HSEG Technology from NASA Goddard adding color enhancement and developing MED-SEG, an FDA approved tool to help specialists interpret medical images.

HSEG is available for licensing outside of the medical field (specifically for soft-tissue analysis).
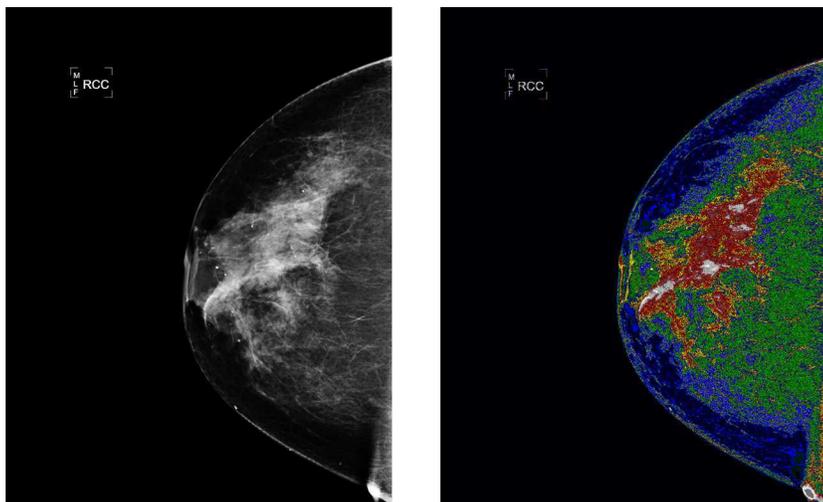
Original mammogram before MED-SEG processing (Left). Credit: Bartron Medical Imaging; and Mammogram, with region of interest (white) labeled (Right), after MED-SEG processing. Credit: Bartron Medical Imaging.

APPLICATIONS

The technology has several potential applications:

- Image pre-processing (specifically, segmentation)
- Image data mining
- Crop monitoring
- Medical Image analysis enhancements (Mammography, X-Rays, CT, MRI, and Ultrasound)
- Facial recognition

PUBLICATIONS

Patent No: 6,895,115; 8526733; 7,697,759

Patent Pending