

Enhanced JPEG2000 Implementation for Bi-level Image Processing

Background: The JPEG2000 specification is a wavelet-based image compression algorithm designed for high resolution digital images with continuous tone image data. The specification was designed to allow viewing of a single image at various resolutions without re-compressing the image: a process called resolution scaling. This resolution scaling ability makes the JPEG2000 specification widely applicable for remotely accessing image data.

While the current algorithm is very good at working with continuous tone images, the current implementation performs poorly when working with bi-level images. This is a problem since bi-level images are commonly encountered in document archival and retrieval applications where the source images are text and drawings such as contracts and blueprints. The limitations of the algorithm would typically be encountered when attempting to view a scaled down version of a bi-level image such as a document or drawing.

Applications:

- This University of Arizona technology can be immediately implemented in document archival and retrieval applications for both continuous tone and bi-level images.
- When using the JPIP protocol, this technology can be extended to remote viewing of all image types using the same JPEG2000 implementation.

Advantages:

- This University of Arizona technology extends the efficiency and resolution scaling capabilities of current JPEG2000 implementations in a single package.

- All media, continuous tone and bi-level images, can be run through the same efficient process, simplifying the image archive and retrieval process.
- Images can be viewed using only 10% of the original data.

The Technology: The technology presented here provides two solutions to the resolution scalability problem for bi-level images. The first method utilizes a policy for assigning 1s and 0s to the white and black regions of the images. By biasing white and black areas of the image, our method allows greatly improved resolution scaling for bi-level images. The second method uses the JPIP protocol to produce images by downsampling the original high resolution source image, but requires only 10% of the original data.

Lead Inventors: Dr Michael Marcellin, PhD.;
Dr. Ali Bilgin, PhD.; Rahul Raguram

Stage of Development: Work is continuing.

Status: Provisional Patent Application

Refer to Case # UA07-039
Contact Robin Richards
r-richards@ott.arizona.edu



Office of Technology Transfer
888 N. Euclid Ave., Rm 204
Tucson, AZ 85721-0158
520.621.5000
ott.web.arizona.edu
licenses@ott.arizona.edu