

CONGRATULATIONS! National Cancer Institute wins Imaging Award Used MetaMorph to Boost Throughput, Quality

June 9, 1998

All of us here at Universal Imaging would like to congratulate Tess Bunnag and Ilona Linnoila of the National Cancer Institute for being selected as Imaging Solution of the Year by Advanced Imaging magazine. Way to go team!



The magazine's June 1998 Special Issue features profiles of individuals who merit special industry attention for their practical handling of digital imaging and image processing challenges.

Tess and Ilona submitted their entry in the Scientific Visualization division, one of 10 categories broken out by the contest administrators.

Here are the contest questions posed by Advanced Imaging and the responses submitted by Tess and Ilona:

Advanced Imaging: Tell us what the Imaging challenge was – the specific need that had to be dealt with in the implementation.

Tess and Ilona: The Experimental Pathology laboratory (NIH) studies lung carcinogenesis in animal models. Our challenge was to quantitate immunohistochemistry per mm of airway in whole lung sections. Before image analysis, slides were scored with a counter and airway total lengths measured with a micrometer. The original implementation required up to 12 microscopic images to be pieced together to see the structures of interest. Image capture, classification and measurement initially required up to a month per airway.

AI: What was the solution? How was the implementation set up and put into effect?

T&I: A protocol was developed to scan the entire microscopic histology slide with a Nikon LS-3510AF 35mm film scanner at the highest resolution to capture complete structures and measure all structures at once, bypassing the microscope. The image for each tissue slide is visualized in one file with printouts used to score details.

Scanning quickly captures the entire tissue section image as a map, rather than capturing many separate microscopic fields. The resolution achieved allows immunohistochemistry marker measurements. Printing at various stages of analysis provides a physical record of the areas of interest for review and/or modification. A permanent case record can easily be accessed, obviating the need to search for original slides.

Adobe Photoshop is used for scanning the image. MetaMorph is used to combine color channels and segment airways from blood vessels, positive markers from negative markers and lesions from background. All of the measurements go directly into a spreadsheet. Color transparencies and color channels can be layered to visualize three dimensional information from serial sections.

AI: List the imaging tools used, naming the specific products used in the solution whenever possible. Include the tools used in: Image acquisition, processing, display, hard copy, storage

and management and communication.

T&I: Universal Imaging Corporation's MetaMorph, Photoshop, Nikon LS-3510AF 35mm film scanner, Hewlett Packard Laser Jet 6MP (enhanced) black and white paper printer, Kodak LT7720 color photographic printer.

AI: Tell us what difference this solution made for the site in question. This will naturally carry considerable weight in our choices.

T&I: The use of Adobe Photoshop with Universal Imaging's MetaMorph quantitation package has significantly increased throughput, quality and quantity of information in our experiments to the point that we can process up to two lung samples a day. Images do not have to be collected by the pathologist and reopened and aligned by the technician. There are fewer images, fewer data files, and much fewer headaches! With an image printout we can record markers or an area of interest. Images are portable at 10-20x for display and transparencies can be stacked or layered to reveal relationships between serial sections.

UIC: Once again, we'd like to raise the glass for Tess and Ilona. A job well done!

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