**Pathology Decision Support System**

e-Pathologist®  H&E*  * Hematoxylin and Eosin

**Description**

NEC’s original combination of advanced image analysis and state-of-the-art machine learning technology makes it possible to recognize the morphological features of tissue and cell nuclei on digitized pathology images. The areas of suspected cancer are extracted by a comprehensive evaluation, including structural analysis at low magnification and cell nucleus analysis at high magnification.

**Features & Benefits**

- Reduced false negative results by pathologists through double checking with e-Pathologist
- Quantitative image analysis improves objectivity of pathology tests
- Fully automatic analysis improves operational efficiency of pathology diagnosis
- Digital archiving of slide image and analysis results
- Automatic report generation of diagnosis result

![Image analysis processing flow](image)

**Fig. 1** Image analysis processing flow
After an H&E-stained pathology slide is scanned into the system, image analysis is performed automatically. The areas of suspected cancer are extracted by analyzing tissue structures and cell nucleus features for each Region of Interest (ROI) automatically selected from the slide image. The result of analysis is presented with different color frames, highlighting areas of suspected cancer or adenoma.

**Technical Excellence**

e-Pathologist extracts morphological features of a target tissue by using NEC’s proprietary combination of advanced image recognition and state-of-the-art machine learning algorithms. Tissue structures are analyzed at low magnification, while cell and nucleus features are analyzed at high magnification.

Fig. 2 Extracted morphological features (Gastric Biopsy)

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Fig. 3 Analysis result of gastric biopsy
Red: Tissue contains areas of suspected cancer
Blue: Tissue doesn’t have any area of suspected cancer

Fig. 4 Analysis result of colorectal biopsy
Red: Tissue contains areas of suspected cancer
Yellow: Tissue contains areas of suspected adenoma
Automated gastric cancer diagnosis on H&E-stained sections, Training a classifier on a large scale with multiple instance machine learning.
http://spie.org/profile/AKIRA.SAITO-2696

Dawn of the digital diagnosis assisting system, can it open a new age for pathology?
Akira Saito, Eric Cosatto, Tomoharu Kiyuna, Michiie Sakamoto.
http://spie.org/profile/AKIRA.SAITO-2696

Automatic classification of hepatocellular carcinoma images based on nuclear and structural features.
http://spie.org/profile/AKIRA.SAITO-2696

http://iospress.metapress.com/content/3502200775577718/?genre=article&issn=2210-7177&volume=35&issue=2&spage=97

Characterization of chromatin texture by contour complexity for cancer cell classification.
Tomoharu Kiyuna, Akira Saito, Elizabeth Kerr, Wendy Bickmore.
http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=4696831&abstractAccess=no&userType=inst