Pathology Decision Support System

Image Analysis Software for H&E* Staining

Fully automatic analysis of H&E-stained sections for efficiency and quality control of pathology diagnosis operations

Software Features

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.

Software Outline (Gastric Biopsy, Colorectal Biopsy)

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.

Fig.1 Image analysis processing flow

Fig.2 Analysis result example of gastric biopsy
Red : Tissue contains areas of suspected cancer.
Blue : Tissue doesn’t have any area of suspected cancer.

Fig.3 Analysis result example of colorectal biopsy
Red : Tissue contains areas of suspected cancer.
Yellow : Tissue contains areas of suspected adenoma.

*Hematoxylin and Eosin
Technology

e-Pathologist® extracts morphological features of a target tissue by using NEC’s original 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.4 At high magnification, outlines of cell nuclei are extracted, and their size, shape and texture are analyzed. (Gastric Biopsy)

Features & Functions

- Quantitative analysis using proprietary image processing
- Machine learning technology extracts areas of suspected cancer precisely.
- Fully automatic operation, from whole-slide scanned image input to analysis and result output.

Advantage of Deployment

- Quality control of pathology diagnosis
- 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
- Reduction of operational cost

Fig.5 Automatically extracted area of suspected cancer (Colorectal biopsy)

Fig.6 Analysis result view

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