Feature extraction from images of endoscopic large intestine

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Feature extraction from NBI image

NBI(Narrow Band Imaging) system.
- A new feature of an endoscope
- This can observe vascular structure without stain process

Vascular area

Average filter
Calculating difference
Binarization

One vascular area is segmented into several areas

Extrapolation of active contour model to improve segmentation.

Model : Level Set Method
Speed function : \( F(x) = \frac{F(x)}{F(x)} \)

Preliminary step for the purpose

Automatic extraction of feature as a basis for the estimate

Feature extraction from conventional image

conventional observation

Stained surface of large intestine

Endoscopic image
Doctor make a diagnosis by observing the stained surface

Pit pattern is extracted as a basis for the estimate

Extraction process

Original image
Color edge extraction
Water segmentation

Area merging

Pit patterns are well extracted from high contrast image but nonpit area is extracted too

Doctor select manually only pit areas

Pit features are calculated

Cluster of each stage (only three stages) is looked

Extracted result and Relation between staging and pit features

Pit features : area, principal axis length, boundary length