

論文の要旨

題目 Stabilization and Image Labeling for NBI Endoscopic Image Recognition
 (大腸 NBI 内視鏡画像認識の安定化と領域分割)

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Colorectal endoscopy is widely used to diagnose colorectal cancer throughout the world and the recent development of narrow-band imaging system enables endoscopists to perform examinations in a short time. However, the intra/inter-observer variability show that the diagnosis can be subjective and highly depend on the endoscopist's experience. Hence, a computer-aided diagnosis system providing an objective measure for diagnosis could be an important diagnostic support during examinations. To this end, the prototype of the system has been developed, which recognize the center of video frame of endoscope and provide classification results to endoscopists in a frame by frame manner. However, this prototype system has two problems: one is that the output of the system is highly unstable because each frame is processed independently. The other is that the system recognizes only part of images or video frames.

In this thesis, we propose three methods to overcome these problems. The first method is a temporal smoothing method for posterior probability curves with a particle filter of Dirichlet distribution that introduces defocus information to likelihood estimation. The second method is an image labeling method with Markov random field and posterior probabilities obtained from a pretrained classifier. The third method is an image labeling method based on a tree of shapes and histogram features computed on the tree structure.