URN etd-0407109-183725-2082
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Statistics This thesis had been viewed 52 times. Download 59 times.
Department
Year 2005
Semester 1
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title The Features Analysis and Classification for Histopathological Image of Thyroid Nodules
Date of Defense 0000-00-00
Page Count 63
Keyword
Thyroid nodule
Image process
Feature classification

Abstract
The thyroid nodule is the very common endocrine problem in the world, especially in iodine-deficient areas. But not all of thyroid nodules are malignant, 95% are benign, and only 5% of the thyroid nodules are malignant. The thyroid cancer occurs in 1% of total cancer. Fine-needle aspiration cytology via ultrasound guiding is the best efficient method to distinguish benign from malignant via the subjectively observation with image features. However, the decisions depend on the experiences of the pathologist. The quantification of image features evaluation will be great benefit for the work of clinical diagnosis and pathological study. In the thesis, the methods of image processing including the HSI color model transformation, fractal analysis and texture features analysis and the statistical method including ANOVA and discriminant analysis were implemented to evaluate and analysis the image features of histopathologic image of the thyroid nodules. The result shows that the values of the parameters have significant differences for various kinds of tissues. The stepwise regression selection procedure was implemented for parameter selecting and the discriminant analysis is applied to classify the tissues. The accuracy of classification is about 88%. It shows that performance is quite well. In the future, more morphological characteristics and rules for empirical observation in pathology should be considered to develop decision rules. It will be helpful to improve the performance of the classification system.
Advisory Committee Yen-Ting Chen - advisor

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etd-0407109-183725-2082-002.pdf

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Date of Submission 2006-08-09