

Artificial Neural Network Based Nuclei Segmentation on Cytology Pleural Effusion Images

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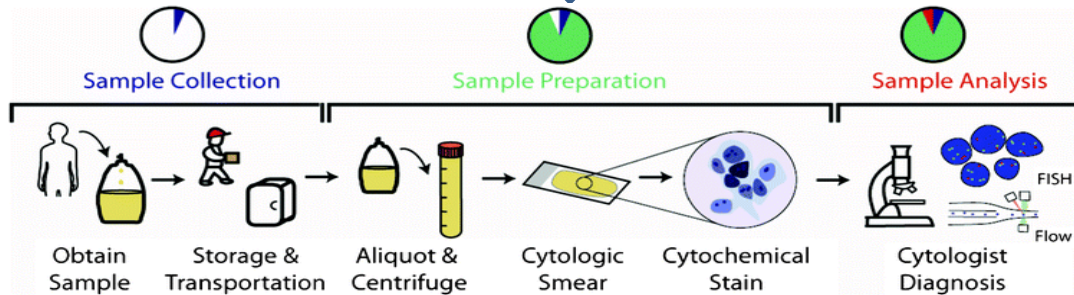
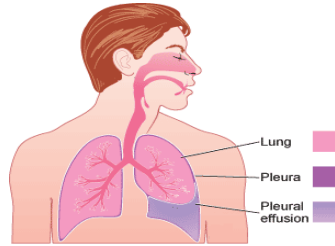
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AUN/SEED-Net



Problem Statement, Motivations and Objectives



- Cytologist requirements
- Time intensive
- Prone to fatigue
- Inter- and intra- observations



Computer Aided
Diagnosis System
of cancer

• Some of the more common causes of Pleural Effusion

- Cancer**
- Pneumonia**
- Tuberculosis (TB)**
- Congestive heart failure
- Liver Disease
- Nephritic syndrome
- Pulmonary embolism
- Lupus and other autoimmune conditions

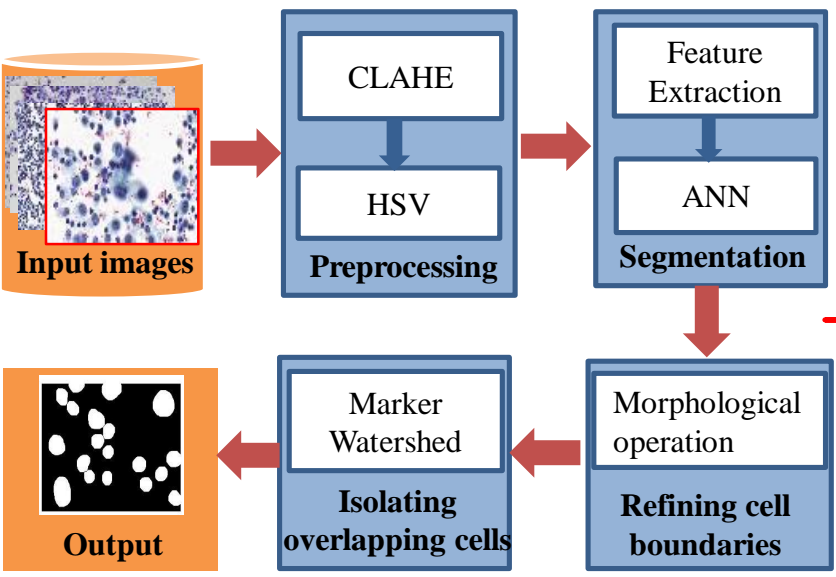
• Objective

- The ultimate goal is to develop a computer aided diagnosis system of cancer cells on cytology pleural effusion images.

• Expected Achievements

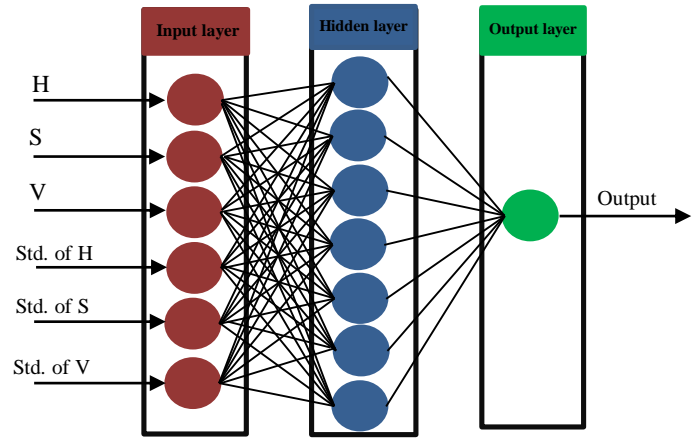
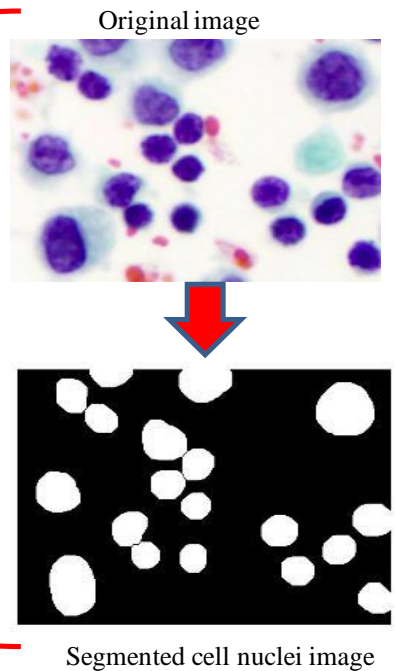
- To save the expert labor
- To save the time
- To provide more precise referenced parameters for the diagnosis.
- Therefore the timely and effective diagnosis of cancer can save and extend the lives of the patients.**

The Proposed ANN-based Cell Nuclei Segmentation



Block Diagram of the proposed cell nuclei segmentation method

- Contributed Stages**
- Image Acquisition
 - Preprocessing
 - Segmentation
 - Post processing
 - Isolating touched or overlapped cell nuclei
 - Evaluation



The proposed architecture of backpropagation neural network (note that: Std. = Standard Deviation)

Types of Images	Number of Images	Segmentation Accuracy		Processing Time
		Precision	Recall	
Cytology images of pleural effusion	35	Precision	0.95%	15 mins
		Recall	0.86 %	
		F-measure	0.90%	
		DSC	92%	

Evaluation of the proposed method