

mammogram analysis will assist radiologist in images interpretation for accurate diagnosis and efficient detection of cancer cells in the earlier stages. This study developed an algorithm to analyze mammograms automatically with colors, in order to detect the abnormal breast tissue. It proposed the use of the Discrete Wavelet Decomposition (DWD) technique using symlet wavelet to find out this detection. Different sets of proposed combination techniques based on the DWD technique were used in order to obtain the best accuracy in breast tissues classification. The study showed that the combination between the un-decimated DWD technique and the Spatial Gray Level Dependency Matrix (SGLDM) achieved the best result. It achieved 98.8% accuracy, 95.0% sensitivity. This accuracy has been verified with the ground truth given in the mini-MIAS database. This algorithm will help to spare women unnecessary and stressful biopsies.

## Contribution ID: 163

### 2. Image Processing

#### 02.05. Computer-aided diagnosis (CAD)

## Digital image processing for objective videokymography

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There are many existing methodologies for diagnostics and treatment of communication disorders, and often they are still subjective in terms of an examiner view. We have focused on the objective evaluation of vocal fold vibrations and their irregularities. Videokymographic cameras are good for evaluation of non-periodic pattern. They have the same time resolution as high speed cameras (HSC), often taken as the first choice, but they scan just smaller subset of lines of the scene and thus are able to capture much longer time interval than HSC and with better image quality. An objective evaluation of collected data can provided by means of computer aided analysis, when characteristics of vibration patterns are estimated using digital image processing and feature detection. We have proposed to process videokymographic data using software based on algorithms for scene analysis. Image processing facilitates the examination and help to objectively estimate characteristics of the vibration patterns. During the often unconformable data acquisition the content of the video stream is automatically evaluated and information-rich parts are preselected and unwanted artifacts are suppressed. Firstly vibration structures (vocal folds borders) are detected, then parameters, capturing present phase, amplitude, left-right correspondence etc. are computed. Numerical representation of vocal fold behavior objectively describes main characteristics and enables to quantify the grades of disease, which can increase the insight into the dynamics of the regeneration. Individual steps of parameter computation are compared the performance of experts (18 sets) to verify robustness of the proposed system. The deterministic approach to parameter evaluation lessens the uncertainty in the tissue categorization.

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### 2. Image Processing

#### 02.05. Computer-aided diagnosis (CAD)

## Computer-aided malignancy discrimination of colon tumor using convolutional neural network

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