ENHANCEMENT AND FEATURE SELECTION FOR CLASSIFICATION OF X-RAY MAMMOGRAM MICROCALCIFICATIONS

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ABSTRACT

MICROCALCIFICATIONS MAY APPEAR AS AN EARLY SIGN OF BREAST CANCER AND PLAY AN IMPORTANT ROLE IN DIAGNOSING MAMMOGRAM.IN GENERAL,THE MODELS OF DETECTING MICROCALCIFICATIONS HAVE DIFFERENT KINDS OF DETECTION SCHEMES AND VARIOUS FEATURE EXTRACTION METHODS.IN THIS THES -IS,A DIAGNOSTIC METHOD WITH TWO STAGE SCHEME AND DATA MINING BASED FEATURE EXTRACTION W -ITH HIGH PERFORMANCE CLASSIFIER IS DEVELOPED TO DETECT MICROCALCIFICATIONS IN X-RAY MAM -MOGRAMS.THIS THESIS PRESENTS A COMPUTER-AIDED DIAGNOSIS (CAD) SYSTEM FOR THE AUTOMATIC DETECTION OF MICROCALCIFICATIONS IN DIGITIZED X-RAY MAMMOGRAMS.THE PROPOSED SYSTEM CONSI -STS OF TWO MAIN STEPS. FIRST,POTENTIAL MICROCALCIFICATION PIXELS ARE SEGMENTED BY A CLO -SED FORM CONSERVATIVE FILTER. THEN, INDIVIDUAL MICROCALCIFICATION IS TESTED BY THE FEAT -URES EXTRACTED FROM THE SPATIAL DOMAIN AND THE SPECTRAL DOMAIN. THE DISCRIMINATORY POWER OF THESE FEATURES IS ANALYZED VIA SEQUENTIAL FORWARD SELECTION METHOD. EXPERIMENT RESULTS SHOW THAT DATA MINING SCHEME IS SUPERIOR TO FEATURES WITHOUT BEING SELECTED. THE SUPPORT VECTOR MACHINE CLASSIFIER IS SUPERIOR TO THE GENERAL REGRESSION NEURAL NETWORK CLASSIFIER.

Keywords : MICROCALCIFICATIONS, FEATURE SELECTION, DATA MINING, CLASSIFIER

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