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Design of a Real Time Heart Sounds Recognition System

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Abstract : Physicians used the stethoscope for listening patient heart sounds in order to make a diagnosis. However, the determination of heart conditions by acoustic stethoscope is a difficult task so it requires special training of medical staff. This study developed an accurate model for analyzing the phonocardiograph signal based on PC and DSP processor. The system has been realized into two phases; offline and real time phase. In offline phase, 30 cases of heart sounds files were collected from medical students and doctor's world website. For experimental phase (real time), an electronic stethoscope has been designed, implemented and recorded signals from 30 volunteers, 17 were normal cases and 13 were various pathologies cases, these acquired 30 signals were preprocessed using an adaptive filter to remove lung sounds. The background noise has been removed from both offline and real data, using wavelet transform, then graphical and statistics features vector elements were extracted, finally a look-up table was used for classification heart sounds cases. The obtained results of the implemented system showed accuracy of 90%, 80% and sensitivity of 87.5%, 82.4% for offline data, and real data respectively. The whole system has been designed on TMS320VC5509a DSP Platform.

Keywords : code composer studio, heart sounds, phonocardiograph, wavelet transform
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