

Research highlights (Dr. Ram Bilas Pachori's research group)

In Signal Analysis Research Lab, we have been working in the broad area of biomedical signal processing based on the new nonlinear and non-stationary signal analysis techniques. We have proposed new methods for analysis and classification of normal and epileptic seizure electroencephalogram (EEG) signals, these methods can be applied for real-time detection of epileptic seizures from EEG signals. We have also proposed new approaches for localization of epileptic focus, classification of sleep stages and human emotions, and detection of alcoholism using EEG signals. The heart rate variability (HRV) signals obtained from electrocardiogram (ECG) have been used to develop new methods for diagnosis of the patients suffering from coronary artery disease (CAD) and diabetes. We have proposed new techniques for analysis and classification of heart valve disorders based on phonocardiogram (PCG) signals. The new technique for automated diagnosis of glaucoma using fundus images has been proposed. We have explored the new techniques for detecting the voiced and non-voiced regions, glottal closure instants, and instantaneous pitch frequency from speech signals. We have also developed cross-terms free time-frequency representation and analysis techniques for multicomponent amplitude and frequency modulated (AFM) signals and images.

