**MEDI-VOICE**

**1. Tech Stack**

**2. Literature Survey**

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| **Paper Name** | **Implemented** | **Drawbacks** | **How to solve** |
| Heart Rate Detection and Classification from Speech Spectral Features Using Machine Learning (2020) | Regression based algorithms on mel MEL frequency spectrum constants | Only used MEL spectrum constant feature from voice and has only been trained on English dataset | Include pitch and mfcc and other spectral constants from speech as features |
| Heart rate monitoring using human speech spectral features (2015) | 20 classifiers used on speech feature MEL spectrum constant | Low classification accuracy  Only one feature used  Results are in a range of heart rates not exact | Use more complex models  And use more features |
| Analysis and prediction of heart rate using speech features from natural speech (2017) | Used random forest regression models on SRI BioFrustration Corpus to classify emotional state and heart rate through live continuous speech | Heart rate predictive accuracy is not good | Integrating more features and using more complex models |
| Heart Rate Extraction from Vowel Speech Signals (2012) | Estimates heart rate from vowel speech signals mapped on a short-term Fourier transform (STFT) | Only focuses on vowel speech. | Integrating this with machine learning and expanding to more features |
| Speech signal analysis for the estimation of heart rates under different emotional states (2016) | Used a empirical linear predictor model to estimate heart rate. Trained on 4000 audio samples with ECG data as labels | Used Feature distances as metric to classify heart rate  And small dataset size | Improve dataset and feature extraction methods |
| Extraction of Heart Rate Parameters Using Speech Analysis | Entropy energy mean frequency standard deviation of the speech signal is being used to estimate the heart rate | Only showed correlation between speech and heart rate parameters | Integrating machine learning |
| How speech processing can help with beat-to-beat heart rate estimation in ballistocardiograms | Uses speech signlas to estimate heart rate from BCG’s | Limited generalizability | Expanded dataset |
| Determining heart rate using speech signal | Uses Fast fourier transforms to map the frequency differences in voice then a regression model to show correlation | Doesn’t estimate the heart rate only shows relation between speech and heart rate | Implementing complex machine learning techniques on the concept |
| Heart rate from read speech influenced by physical exercise | Used pre-trained SBreathNet deep learning model to extract breathing patterns on which Independent component analysis was applied | Limited sample size  Only 7 participants data | Use other speech features along with breathing patterns to get a more accurate estimation |
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**3. Abstract**

**4. Introduction**

**5. System Design**

**5.1) Use Case Diagram**

**5.2) Workflow Diagram**

**6. Methodology**

**7. Detailed System Design**

**7.1) DFD level 0 diagram**

**7.2) DFD level 1 diagram**

**7.3) Birds eye view diagram**

**8. Implementation**

**9. Testing**

**10. Results and conclusion**