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ijircce@gmail.com



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# Infant Need Sensing Using Deep Learning Model

Dr.V. Ramachandran<sup>1</sup>, G.Manideep<sup>2</sup>, G.Lokesh Sai<sup>3</sup>, G.Nelson Asher<sup>4</sup>

Professor, Dept. of Information Technology, Vasireddy Venkatadri Institute of Technology, Guntur,  
Andhra Pradesh, India<sup>1</sup>

B.Tech Student, Dept. of Information Technology, Vasireddy Venkatadri Institute of Technology, Guntur,  
Andhra Pradesh, India<sup>2,3,4</sup>

**ABSTRACT:** This abstract describes the automatic infant cry recognition system which main task is to identify and differentiate between pain and non-pain cries belonging to infants. The system accuracy reported in this study varies from 60% up to 76.2% under different parameter settings. The results demonstrated that in general, the infant cry recognition system performs better by using the MFCC (Mel-Frequency Cepstral Coefficients ) feature sets.

Five different types of crying considered in this work are hungry, sleepy , tired, burping and discomfort. These cries are preprocessed and converted for calculation of Mel-Frequency Cepstral Coefficients (MFCC) before being classified by Support vector Machine model (SVM).

**KEYWORDS:** Mel-Frequency Cepstral Coefficients , Support vector Machine model.

## I. INTRODUCTION

Cry is an essential sign of life in everybody's life. Cry is a multi model and a complex action with a lot of information. Most of the infants cry at the time of birth , even doctors also make them cry. This was done because it is hard to take breadth for new born so doctors make them cry so oxygen inhalation takes during this time . Not only this , in fact the cry means a lot. It is the only way of communication at their early stage . Eventually a baby has a lot of needs such as hunger, discomfort, burping, noise, laughter, silence, belly pain and tiredness. We use features like mel-frequency cepstral coefficients (MFCC) , Short Time Energy (STE), Short Time Zero Crossing Rate (STZCR), Short Time Energy Acceleration, Spectral Centroid, Spectral Bandwidth, Spectral Rolloff and Spectral Flatness. Here we gathered baby sounds each duration 500 milliseconds where 80% data used for training and 20% used for testing. Here we use a multi class support vector machine (SVM) to train the model. This model gets an accuracy score of 84% in the classification of baby audio.

## II. PROPOSED SYSTEM

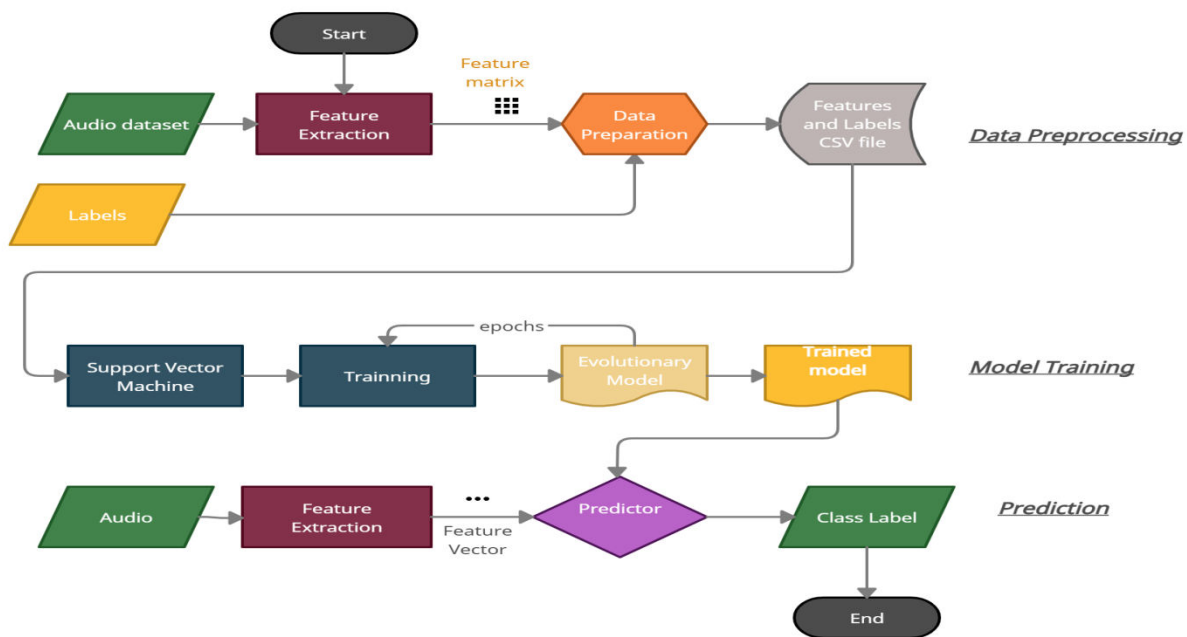
- Here we are using multi model architecture i.e one model is used to detect the cry and the other model is used to detect what kind of cry.
- To obtain more accuracy we are using 11 mel frequency cepstral coefficients and 9 other factors to determine the baby cry.
- The proposed system maintains more standardized of the dataset.
- The proposed system gives an accuracy of nearly 80%.

### III. SUPPORT VECTOR CLASSIFICATION

Support vector machines (SVMs) are a set of supervised learning methods used for classification.

- A support vector machine constructs a hyper-plane or set of hyper-planes in a high or infinite dimensional space, which can be used for classification.
- SVC implement the “one-versus-rest” approach for multi-class classification.
- A support vector machine constructs a hyper-plane or set of hyper-planes in a high or infinite dimensional space, which can be used for classification.
- Intuitively, a good separation is achieved by the hyper-plane that has the largest distance to the nearest training data points of any class (so-called functional margin), since in general the larger the margin the lower the generalization error of the classifier

### IV. SYSTEM OVERVIEW



### V. CONCLUSION

The need of the baby is recognised using the proposed system. We're employing machine learning approaches in this case. The SVM multi class classifier is widely used for classification of data. The support vectors and hyper planes generate accurate, fair and helpful results for parents. Since BSR and BCR are serialized and they are machine independent, they can be used where and backend friendly. We can also use google colab to test the models for their results. In this project we are presenting a model that can be used for recognizing the baby cry.As Cry is the major communication of the infant it plays a major role in prediction . Here first the preprocessing of data is done during preprocessing the audio data is converted into numerical data by using librosa package. It consists of mel frequency cepstral coefficients which are used for conversion. The model is trained by using the Support Vector Machine model which gives better prediction results.

### VI. FUTURE SCOPE

And the future scope of this project is, we can perform some more number of operations and maintain much accuracy. And we can also implement a mobile application so that it makes very easy to identify the baby cry and alert the parents by using the technology.



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