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Baby Cry Detection in Domestic Environment using Convolutional Neural Networks

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Abstract, In this paper we will identify a cry signals of infants and the explanation behind the screams below 0-6 months of segment age. Detection of baby cry signals is essential for the pre-processing of various applications involving crial analysis for baby caregivers, such as emotion detection. Since cry signals hold baby well-being information and can be understood to an extent by experienced parents and experts. We train and validate the neural network architecture for baby cry detection and also test the fastAI with the neural network. Trained neural networks will provide a model and this model can predict the reason behind the cry sound. Only the cry sounds are recognized, and alert the user automatically. Created a web application by responding and detecting different emotions including hunger, tired, discomfort, bellypain.

Keywords: react-fastai-convolutionary neural network- cry of infants- Classified

I. INTRODUCTION

For babies, crying is a form of communication to communicate their physical and emotional conditions. The crying cycle includes many parts of the brain such as limbic and brainstem systems, and is connected to the respiratory system. The features of weeping reflect the dignity and development of the central nervous system. Cry signals have long been the focus of study and review Studies have found ample evidence that cry signals can provide useful information on the physical and psychological conditions of newborns. Automatic recognition and classification of acoustic phenomena in audio signals represents a daunting area of research into auditory machine perception. For about six decades, scientists from various scientific disciplines have been studying the acoustic properties of infant cries, such as fundamental levels of pitch, intensity or resonance. Due to vocal cord activity causing irregular air bursts, a baby cry is triggered by rhythmic changes between the inhalation and exhalation. Many research indicate the infant cry is ideal for identifying a child's mood, such as hunger, fatigue or discomfort, sleep, bellypain.

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While conducting overall research on the same project, we created a web application for effective use. Technologies used in theis web application react as front end and as back end flash. We practiced with the fastai library the convolutionary neural network, and predicted the results. The following paper is. Section 3 discusses the block diagram, and section 4 describes the outputs and consequences, and section 5 presents the measures and conclusions.

II. PROPOSED SYSTEM METHODOLOGY

A. Fastai

We used the FastAI library to train the neural-convolution network. Fastai is the first deep learning library to provide a simple, clear interface for all of the most widely used deep learning applications for vision, text, tabular data, time series and collaborative filtering.

B. Convolutional Neural Network

Convolutionary Neural Network (CNN, or ConvNet) is a type of deep neural networks, most commonly used for processing visual imagery. These are also known as artificial neural networks with invariants of shifts or of space. They have Reputation for image and video applications. Convolutional neural network focuses primarily on image recognition and processing specifically designed to process pixel data, so we trained this algorithm with the fastai library to predict the model and validate the model's graphical representation. The object of the melspectrogram is an acoustic representation of a sound in time-frequency. . The spectral power density. At equally spaced frequency and time (on a frequency scale of mel) it is sampled in many areas. Uses a melspectrogram to translate the image into the audio signal. In sound processing, the mel-frequency cepstrum (MFC) is a representation of a sound's short-term power spectrum, based on a linear cosine transformation of a log power spectrum at a nonlinear frequency mel scale.

C. React

We developed a Web application using react. The aim of developing a web application is to stimulate all parents to discover the reason behind the infant scream.
React is a javascript application (also called React.js or ReactJS) designed to construct user interfaces. It is operated by facebook and an individual developer and group of companies. React may serve as a foundation for the development of web applications. It first records the audio from the phone, and sends it to the server.

D. Flash

Flash is a micro Program python-written. It is known as a microframework because it does not require resources or libraries unique to it.

The captured audio signals are sent to the server, and the audio signals are transformed using melspectrogram to the image depicted as graphical. Using the trained model the graphical representation is checked.

III. BLOCK DIAGRAM

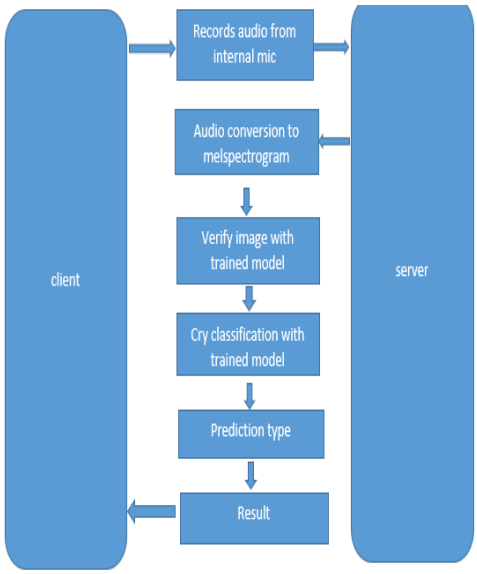

Fig 1

IV. OUTPUTS

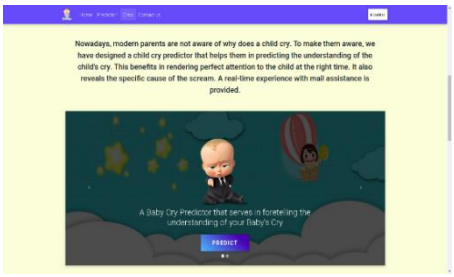

Fig 2. Predicting the input

Fig 3. Activate

Fig 4. Deactivate

Fig 5. Result

V. CONCLUSION

Baby cry detection in this paper is the method of segmenting a cry signal that is recorded into a homogeneous region in a real clinical environment. Used with convolution neural network with fastai library, the cry units will be identified by automatic cry segmentation. It recognizes only the cry sounds in a real world, and notifies the user via mail. Our main objective was to precisely locate important audible cry portion boundaries of continuous recording and to establish a cry segmentation system that can be applied in the early age (0-6 months) and to find the reason behind the feedback given, and we find the reasons such as belly pain, tiredness, discomfort, hunger, burp, lonely, coldhot.

FUTURE WORK

Advancing baby cry identification in home environment, growing in accuracy and following specific methods with a more detailed attempt also to determine child cry suitability.

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