Analyzing Infant Crying Patterns: Classification of Hunger and Discomfort

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Infant crying is the crying of infants as a response to an internal or external stimulus. Infants cry as a form of basic instinctive communication. An infant's cry contains a lot of information about the baby such as hunger, pain, discomfort, sleepiness, burp, anger, etc. Parents' or guardian's inability to recognize and timely address the reason for the infant's cry prompts dissatisfaction for the infant and a feeling of helplessness for the parents. Therefore, an accurate, efficient automatic method for analyzing infant cry patterns and notifying the cause of cry is a very useful tool for parents. This study aims at the detection of baby cry patterns and identification of uniqueness of the hunger and discomfort crying patterns of the infants. This is achieved through analyzing the different patterns of the sound waves of the infants crying by converting the crying signal to an equivalent frequency waveform. This novel model can fill the gaps in the current models by achieving higher accuracy. Thus, this research is beneficial in various ways such as reducing parental dissatisfaction and helplessness when infant crying, minimizing child abuse and helping parents to better understand their child's needs and psychosis by analyzing crying patterns. The proposed model detects sound frequency, draws the waveform of the signal, and uses a Convolutional Neural Networks methodology to identify and distinguish the crying patterns of the infants. The dataset was collected, and the crying patterns were labeled by getting assistance from the domain experts. The model was trained and tested against the labeled data and it gained an accuracy of 91%. The proposed model will be further enhanced to identify more feelings of the infants and will be further developed to assists to recognize selected medical conditions by analyzing the crying patterns of the infants.

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