

Analysis of Infant Cry Using Short Time Fourier Transform (STFT)

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ABSTRACT

Crying is the only method of communication for an infant's to express their needs and feelings. The information regarding the state of an infant, such as hunger or pain, can be determined from an infant's cry. This study focuses on the analysis of the cry signals (hunger, pain) to obtain information that can be used to classify the signal automatically. STFT was used to extract the information embedded in both cry signals. The pain cry produced more intense and longer duration than hunger cry. Hunger cry however, can be classified to have consistent shift pattern. These were key characteristics that can be used for an early classification method for both type of cry.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The infant cry can be analyzed to determine whether the baby is hungry, uncomfortable, or in pain. This is important because once the causes of crying are detected, the parent can take appropriate step regarding the issues. This is the reason why such an analysis of infant cry has been the subject of researchers over the past thirty years. Conventionally, the parents and specialists were able to differentiate modes of cry by using their instincts and comparing different types of cries. In a clinical setting, an abnormal cry can be an indicator of genetic or pathological problems and in the latter cases, the rapid identification of infants who are said to be “at risk” can lead to a faster and hopefully more successful treatment which will enable the development of these infants to proceed along a normal path [1].

It is also known that both deaf and healthy infants commonly shares attributes like pain or hunger cry [2]. A baby's cry can provide us with a window to the brain. Special characteristics of newborn pain cries have been identified in various pathological states such as brain damage [3], cleft palate [4], hydrocephalus [5] and sudden Infant Death Syndrome (SIDS) [6]. Severe cry can lead to child abuse and it is important for mothers with crying babies to understand that it is colic [causing the cries] and that it is not their fault [6].

Considering that the babies really have a communicative intention [7] it becomes important to develop method to estimate, objectively, the infant communications, allowing the parents or care-takers to supply its needs more conscious, therefore with more security. Infant cry signal can be used to distinguish between normal and abnormal pathological conditions.