UNIVERSITY OF SOUTH FLORIDA

Defense of a Master's Thesis

Automatic Pain Assessment from Infants' Crying Sounds
by
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For the MSCS degree in Computer Science & Engineering

Crying is infants utilize to express their emotional state. It provides the parents and the nurses a criterion to understand infants' physiology state. Many researchers have analyzed infants' crying sounds to diagnose specific diseases or define the reasons for crying. This thesis presents an automatic crying level assessment system to classify infants' crying sounds that have been recorded under realistic conditions in the Neonatal Intensive Care Unit (NICU) as whimpering or vigorous crying. To analyze the crying signal, Welch's method and Linear Predictive Coding (LPC) are used to extract spectral features; the average and the standard deviation of the frequency signal and the maximum power spectral density are the other spectral features which are used in classification. For classification, three state-of-the-art classifiers, namely K-nearest Neighbors, Random Forests, and Least Squares Support Vector Machine are tested in this work, and the experimental result achieves the highest accuracy in classifying whimper and vigorous crying using the clean dataset is 90%, which is sampled with 10 seconds before scoring and 5 seconds after scoring and uses K-nearest neighbors as the classifier.

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3:00pm-4:00pm
ENB 313

THE PUBLIC IS INVITED

Examining Committee
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