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Generalizability of Music Emotion Classifiers: An Evaluation of the Applicability of *miremotion* in Emotion Classification of Sri Lankan Folk Melodies

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Music conveys and evokes powerful emotions, owing to various musical characteristics such as rhythm, melody, and orchestration. This amazing ability has motivated the researchers worldwide to discover relationships between music and emotion. As a result, various data mining tasks are carried out where state-of-the-art machine learning techniques are utilized in music emotion classification. However, the literature reveals that these studies frequently employ western or western classical music. Since the emotional expression in music is carried out through various musical characteristics which are cultural-specific, generalizability of classifiers trained using different ground-truth music in new contexts warrants further research. Therefore, in our study *miremotion* which is an existing classification model defined in MATLAB MIRTtoolbox was investigated for its applicability in Sri Lankan folk melodies which is an abundant source of emotion expression. *miremotion* is a classification model trained using Western film music which is presented by previous scholars after extensive research. Our study comprised of a listening experiment, subjects being thirty university students (age 30-35 years; from non-music disciplines) in which subjective ratings for 'happy', 'sad', 'tender', 'anger', and 'fear' were obtained using a seven point Likert scale. Thirty music files (30s; 44100Hz; stereo; 32bit; .wav) were employed as the music stimuli. Objective predictions using *miremotion* were obtained for the same on the above-mentioned emotion categories. To identify the differences among the subjective ratings and the objective predictions, paired t-tests were performed. Between the two groups no significant difference was noted only for 'anger' ($p > 0.05$) where significant differences were noted for all other emotions: 'happy' ($p < 0.001$), 'sad' ($p < 0.05$), 'tender' ($p < 0.05$), and 'fear' ($p < 0.05$). The findings reveal that music-emotion classification models cannot always be generalized and that their applicability varies depending on the emotion. Findings are also in support of the need for developing classification models for cultural-specific melodies. The study further aims to apply machine learning techniques for emotion classification of Sri Lankan folk melodies followed by a comparison among different standard classification algorithms. Use of a limited number of thirty music files in this study was due to the need for considering a reasonable number of stimuli for human listeners in an experiment. The study was also limited by the inclusion of a homogeneous study population where further studies are needed which pay higher emphasis on the annotator profiles, as music-emotion perception is highly influenced by sociocultural and educational background.

Keywords: Music emotion classification, Machine learning, Sri Lankan folk melodies, Miremotion