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Exploring Music Similarity through Siamese CNNs using Triplet Loss on Music Samples

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In the rapidly evolving digital music landscape, identifying similarities between musical pieces is essential to help musicians avoid unintended copyright infringement and maintain the originality of their work. However, detecting such similarities remains a complex and computationally challenging problem. A novel approach to address this issue is a song similarity detection system that utilizes a Siamese Convolutional Neural Network (CNN) with Triplet Loss for effective audio input comparison. The model is trained on a custom dataset from WhoSampled, an extensive database of information on sampled music, cover songs, and remixes. The dataset comprises pairs of audio samples and interpolations, making it suitable for the Siamese CNN approach. Incorporating Triplet Loss enhances the model's performance by learning discriminative features for improved comparison. The performance of this system is assessed using a confidence interval-based metric, achieving a 96.86% accuracy at a 99.7% confidence level in determining the similarity between music samples. The solution provides a helpful tool for musicians to actively compare their creations with existing songs, helping to reduce the likelihood of unintentional plagiarism and possible legal issues.

Keywords: *music similarity, siamese convolutional neural networks, triplet loss, music samples, copyright infringement*