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Quantifying Uncertainty in Music Genre Classification

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Music annotation algorithms apply signal processing and machine learning techniques to extract and add metadata to audio recordings in music archives. One common task is music genre classification, where a single label (such as Rock, Pop, or Jazz) is assigned to each song. Since music genres are often ambiguous, classification algorithms naturally cannot obtain fully correct predictions. Therefore, our focus is not only on the label with the highest posterior class probability but also on on a realistic confidence value for each of the possible genres. In theory, most state-of-the-art classification algorithms based on deep neural networks suffer from overconfident predictions which complicates the interpretation of the final output values. With this work, we investigate whether the problem of overconfident predictions, and therefore non-representative confidence values, is also applying to music genre classification. Furthermore, we outline state-of-the-art methods for preventing this behaviour and investigate the influence of the so-called temperature scaling to get more realistic confidence outputs which can be directly used in real-world music tagging applications.

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