

**DAGA2023/428**

# **An Introduction to Unsupervised Domain Adaptation in Sound and Music Processing**

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Common machine learning models require large amounts of training data with samples representing the intended application scenario. However, these models often do not generalize well to novel data distributions caused by variations of the expected conditions. Such a lack of robustness can lead to a significant decrease in the model performance. This issue is known as domain shift and can be caused in the case of audio data by deviations of microphone characteristics or acoustic environments between data from the source domain (training data) and target domain (test data). Unsupervised domain adaptation (UDA) aims to restore the model performance by transferring knowledge from labeled samples of the source domain to unlabeled samples of a related target domain. We first provide an overview over basics and general approaches of UDA. Then, we study UDA for two audio analysis tasks: sound event detection (SED) and automatic music transcription (AMT) of piano music. Our results show that domain shift caused by microphone mismatch has a greater impact on the model performance for SED than AMT. As a possible cause we suspect that while SED analyzes the full spectral envelope, AMT examines only the harmonic peaks whose positions are less affected by domain shift.

Anzahl der Wörter in der Zusammenfassung: 200

Klassifikation: Elektroakustik und Audiosignalverarbeitung

Strukturierte Sitzung: Sound Analysis for Music and Audio Signals

Präsentationsart: Vortrag bevorzugt

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