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**EXPLORING FEATURE COUPLING AND MODEL COUPLING FOR IMAGE SOURCE IDENTIFICATION**

**ABSTRACT:**

Recently, there has been great interest in feature-based image source identification. Previous statistical learning-based methods usually regarded the identification process as a classification problem. They assumed the dependence of features and the dependence of models. However, the two assumptions are usually problematic because of the genuine coupling of features and models. To address the issues, in this paper, we propose a novel image source identification scheme. For the feature coupling, a coupled feature representation is adopted to analyze the coupled interaction among features. The coupling relations among features and their powers are measured with Pearson's correlations and integrated in a Taylor-like expansion manner. Regarding model coupling, a new coupled probability representation is developed. The model coupling relationships are characterized with conditional probabilities induced by the confusion matrix and then combined with the law of total probability. The experiments carried out on the Dresden image collection confirm the effectiveness of the proposed scheme. Via mining the feature coupling and model coupling, the identification accuracy can be significantly improved.