**Acoustic Signature Recognition Using Artificial Neural Network**

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 **Abstract:**

 The sound of a working vehicle provides an important clue to the vehicle type. The patterns in the sound of every vehicle can be extracted with the help of pattern recognition. In this work, we have proposed an acoustic signature based neural network model for recognizing different types of two-wheelers. Two-wheelers of three major Indian makes, namely Honda, Bajaj and Yamaha, will be considered in the work. Acoustic signature is one of the quality standards of manufacturer. Several similar bikes will have different acoustic patterns due to variation in conditions during manufacturing. In the proposed work, Artificial neural network (ANN) as a multilayer perceptron feedforward network was incorporated for developing a predictive model. In the current work we have used two algorithms Levenberg-Marquardt and Gradient-Descent, to model the sound frequency distribution features. We show that it can be a simple and reliable acoustic signature identification method if the training samples can be properly chosen and categorized. A collection of typical sound samples is used as the training data set. It is a fact that classification accuracy depends on different factors such as their usage, maintenance, environmental and road conditions.