

Unsupervised Classification of Beluga Whale Vocalizations

Unsupervised classification techniques are designed to discover natural groupings in a collection of data. For instance, unsupervised classification methods can be used to help define a repertoire for a species by grouping similar vocalizations together. The vocalizations grouped together are then defined as a single call type in the repertoire. There are a number of difficulties in applying these algorithms to vocalizations including quantifying the vocalization into a set of features and accounting for temporal variations in the vocalizations. Using generalized perceptual linear predication coefficients and a set of hidden Markov models to overcome these difficulties, beluga whale vocalizations are classified using K-means unsupervised classification. These classifications are then compared to labels assigned by human experts in order to determine the reliability of the classification system. The underlying goal of this research is to establish a generalized framework that can be used to analyze and classify the vocalizations of a number of species.

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