

Design and Implementation of Generative Models for Odor Classification Using Electronic Nose

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Abstract : In the midst of the five senses, odor is the most reminiscent and least understood. Odor testing has been mysterious and odor data fabled to most practitioners. The delinquent of recognition and classification of odor is important to achieve. The facility to smell and predict whether the artifact is of further use or it has become undesirable for consumption; the imitation of this problem hooked on a model is of consideration. The general industrial standard for this classification is color based anyhow; odor can be improved classifier than color based classification and if incorporated in machine will be awfully constructive. For cataloging of odor for peas, trees and cashews various discriminative approaches have been used Discriminative approaches offer good prognostic performance and have been widely used in many applications but are incapable to make effectual use of the unlabeled information. In such scenarios, generative approaches have better applicability, as they are able to knob glitches, such as in set-ups where variability in the series of possible input vectors is enormous. Generative models are integrated in machine learning for either modeling data directly or as a transitional step to form an indeterminate probability density function. The algorithms or models Linear Discriminant Analysis and Naive Bayes Classifier have been used for classification of the odor of cashews. Linear Discriminant Analysis is a method used in data classification, pattern recognition, and machine learning to discover a linear combination of features that typifies or divides two or more classes of objects or procedures. The Naive Bayes algorithm is a classification approach base on Bayes rule and a set of qualified independence theory. Naive Bayes classifiers are highly scalable, requiring a number of restraints linear in the number of variables (features/predictors) in a learning predicament. The main recompenses of using the generative models are generally a Generative Models make stronger assumptions about the data, specifically, about the distribution of predictors given the response variables. The Electronic instrument which is used for artificial odor sensing and classification is an electronic nose. This device is designed to imitate the anthropological sense of odor by providing an analysis of individual chemicals or chemical mixtures. The experimental results have been evaluated in the form of the performance measures i.e. are accuracy, precision and recall. The investigational results have proven that the overall performance of the Linear Discriminant Analysis was better in assessment to the Naive Bayes Classifier on cashew dataset.

Keywords : odor classification, generative models, naive bayes, linear discriminant analysis

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