Camera Ready Summary

Conference Name
25th International Conference on Artificial Intelligence and Statistics (AISTATS 2022)

Paper ID
1709

Paper Title
On Some Fast And Robust Classifiers For High Dimension, Low Sample Size Data

Abstract
In high dimension, low sample size (HDLSS) settings, distance concentration phenomena affects the performance of several popular classifiers which are based on Euclidean distances. The behaviour of these classifiers in high dimensions is completely governed by the first and second order moments of the underlying class distributions. Moreover, the classifiers become useless for such HDLSS data when the first two moments of the competing distributions are equal, or when the moments do not exist. In this work, we propose robust, computationally efficient and tuning-free classifiers applicable in the HDLSS scenario. As the data dimension increases, these classifiers yield perfect classification if the one-dimensional marginals of the underlying distributions are different. We establish strong theoretical properties for the proposed classifiers in ultrahigh-dimensional settings. Numerical experiments with a wide variety of simulated examples and analysis of real data sets exhibit clear and convincing advantages over existing methods.

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Camera Ready Files
1709.pdf (527.2 Kb, 2/20/2022, 9:33:43 PM)
1709-Permission.pdf (386.4 Kb, 2/20/2022, 9:34:54 PM)
1709-supp.zip (118.3 Kb, 2/20/2022, 9:35:20 PM)

Camera Ready Questions Response

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5. Format

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6. Code/dataset promise

Yes

7. Code release

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