Optimal classification of the multivariate GRF observations

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The problem of classifying a single observation from a multivariate Gaussian field into one of the two populations specified by different parametric mean models and common intrinsic covariogram is considered. This paper concerns with classification procedures associated with Bayes Discriminant Function (BDF) under the deterministic spatial sampling design. In the case of parametric uncertainty, the maximum likelihood estimators of unknown parameters are plugged in the BDF. The actual risk and the Approximation of the Expected Risk (AER) associated with aforementioned plug-in BDF are derived. This is an extension of the results in the papers [1], [2] to the multivariate case with general loss function and for complete parametric uncertainty, i.e. when parameters of the mean and the covariance functions are unknown. The values of the AER are examined for various combinations of parameters for the bivariate, stationary geometric unisotropic Gaussian random field with exponential covariance function sampled on a regular 2-dimensional lattice.

References

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