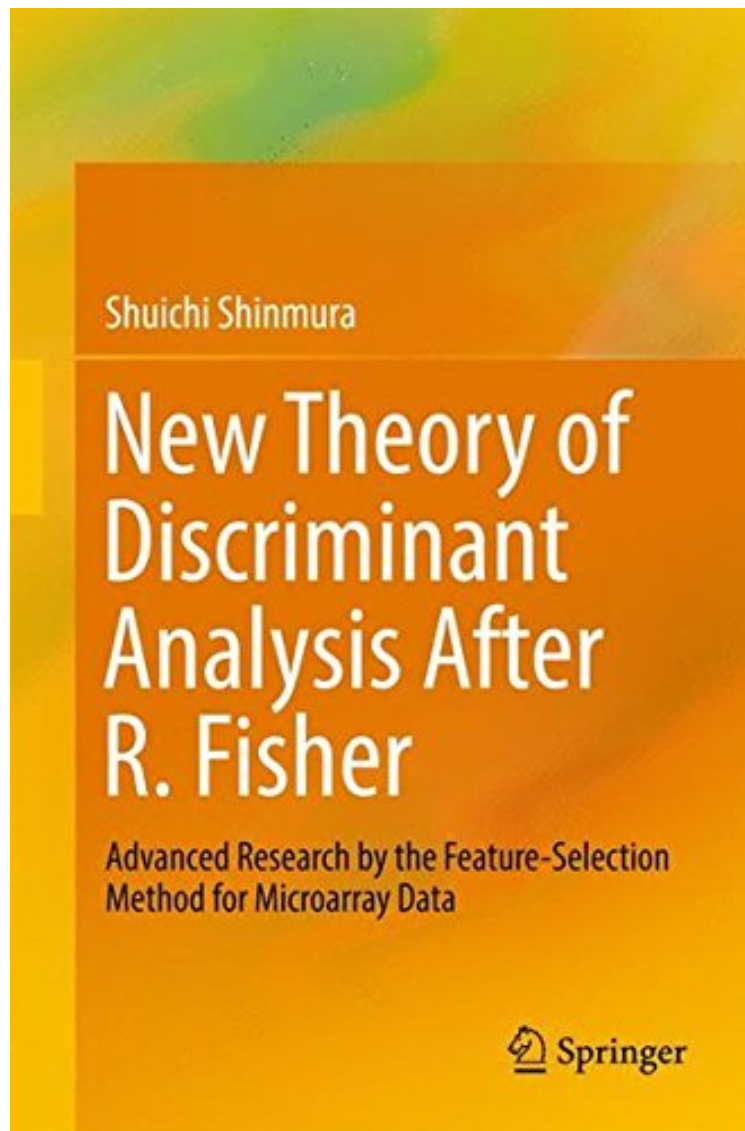


[Mobile book] New Theory of Discriminant Analysis After R. Fisher: Advanced Research by the Feature Selection Method for Microarray Data

# New Theory of Discriminant Analysis After R. Fisher: Advanced Research by the Feature Selection Method for Microarray Data

*Shuichi Shinmura*

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## Selection Method for Microarray Data:

This is the first book to compare eight LDFs by different types of datasets, such as Fishers iris data, medical data with collinearities, Swiss banknote data that is a linearly separable data (LSD), student pass/fail determination using student attributes, 18 pass/fail determinations using exam scores, Japanese automobile data, and six microarray datasets (the datasets) that are LSD. We developed the 100-fold cross-validation for the small sample method (Method 1) instead of the LOO method. We proposed a simple model selection procedure to choose the best model having minimum  $M_2$  and Revised IP-OLDF based on MNM criterion was found to be better than other  $M_2$ s in the above datasets. We compared two statistical LDFs and six MP-based LDFs. Those were Fishers LDF, logistic regression, three SVMs, Revised IP-OLDF, and another two OLDFs. Only a hard-margin SVM (H-SVM) and Revised IP-OLDF could discriminate LSD theoretically (Problem 2). We solved the defect of the generalized inverse matrices (Problem 3).

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