

Chapter 5

Pass/Fail Determination Using Examination Scores
- A Trivial Linear Discriminant Function –

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Abstract. In this chapter, we examine the k-fold cross-validation for small sample method (Method1) by combining re-sampling technique with k-fold cross-validation. By this breakthrough, we obtain the mean error rates, M1 and M2, in the training and validation samples and the 95% confidence interval (CI) of the discriminant coefficient. Moreover, we proposed the straightforward and powerful model selection procedure that we chose the model with a minimum M2 as the best model. We apply this new method and procedure to the pass/fail determination using exam scores. By fixing the constant = 1 for seven LDFs, we obtain several good results as follows:
1) M2 of Fisher’s LDF are over 4.6% worse than Revised IP-OLDF.
2) The soft-margin SVM (S-SVM) for penalty c=1 (SVM1) is worse than another mathematical programming (MP) based LDFs and logistic regression.
3) We obtain the 95% CI of the discriminant coefficients. If we choose the median of the coefficient of seven LDFs except for Fisher’s LDF, those are almost the same as the trivial LDF for the linearly separable model.

5.1 Introduction

5.2 Pass/Fail Determination Using Exam Scores Data in 2012

5.3 Pass/Fail Determination by Exam Scores (50% level in 2012)

5.3.1 MNM and Nine NMs
5.3.2 Error Rate Means (M1 and M2)
5.3.3 95% CI of Discriminant Coefficients

5.4 Pass/Fail Determination by Exam Scores (90% level in 2012)

5.4.1 MNM and Nine NMs
5.4.2 Error Rate Means (M1 and M2)
5.4.3 95% CI of Discriminant Coefficient

5.5 Pass/Fail Determination by Exam Scores (10% level in 2012)

5.5.1 NMs and Nine NMs
5.5.2 Error Rate Means (M1 and M2)
5.5.3 95% CI of Discriminant Coefficients

5.6 Summary

Reference


Bibliography

Researchers can download author’s papers with underlined author’s name from the Research Gate.

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