Applied Multivariate Analysis - Web course

COURSE OUTLINE

Multivariate analysis is a fundamental concept in applied statistics. In this course, we shall first look at basic concepts of multivariate distributions and study standard multivariate distributions which provide multivariate counterparts of the univariate distributions.

Multinomial, multivariate normal, Wishart and Hotelling's T^2distributions shall be studied in detail.Important applied multivariate data analysis concepts of principal component analysis, profile analysis, multivariate analysis of variance, cluster analysis, discriminant analysis and classification, factor analysis and canonical correlations analysis shall be covered.

The theoretical concepts as well as practical data analysis using real life data shall be used to illustrate and study the concepts.

COURSE DETAIL

Module No.	Topic/s	Lectures
1	Basic concepts of multivariate distributions	2
2	Multinomial and multivariate normal distributions	5
3	Wishart and Hotelling's T^2distributions	6
4	Principal component analysis and other multivariate data visualization techniques	4
5	Profile analysis	3
6	Multivariate analysis of variance (MANOVA)	3
7	Multiple correlation coefficient	1
8	Cluster analysis	3

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Mathematics

Pre-requisites:

Basic courses in Probability, Random Variable, Distribution Theory, Mathematical Statistics and Matrix Theory

Additional Reading:

- Anderson, T.W., *An introduction to multivariate statistical analysis*, New York, John Wiley & Sons, 1958.
- Mardia,K.V., Kent,J.T., Bibby,J.M., *Multivariate Analysis*, London: Academic Press, 1979.
- Eaton, M.L., *Multivariate Statistics*, John Wiley, 1983.

Hyperlinks:

- http://en.wikipedia.org/wiki/Multivariate_analysis
- http://en.wikipedia.org/wiki/Multivariate_statistics
- http://faculty.chass.ncsu.edu/garson/PA765/statnote.htm

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9	Discriminant analysis and classification	5
10	Factor analysis	4
11	Cannonical correlation analysis	4

References:

1. *Johnson, R. A. and Wichern, D. W., Applied Multivariate Statistical Analysis* (2nd edition), Prentice Hall International, U.S.A., 1998.

2. Muirhead, R. J., *Aspects of Multivariate Statistical Theory,* John Wiley & Sons Ltd. (Wiley Series in Probability and Mathematical Statistics. Probability And Statistics), Canada, 1982.