ST3011 Multivariate Linear Analysis (MLA) [5 credits]

Lecturer(s): Assistant Professor Brett Houlding (brett.houlding@tcd.ie)

Module organisation

SEMESTER: 1 & 2	LECTURE/WEEK:2	LABS/WEEK: 1
DURATION (WEEKS): 24	TOTAL: 22	TOTAL: 11

Module description, aims and contribution to programme

Classical multivariate techniques of discriminant analysis, principal component analysis, clustering and logistic regression are examined. There is a strong emphasis on the use and interpretation of these techniques. More modern techniques, some of which address the same issues, are covered in the SS module Data Mining.

Learning outcomes

When students have successfully completed Multivariate Analysis they should be able to:

1. Define and describe various classical dimension reduction techniques for multivariate data.
2. Implement clustering and/or classification algorithms and assess and compare the results.
3. Interpret output of data analysis performed by a computer statistics package.

Module content

- Principal Components Analysis
- Multidimensional Scaling
- Factor Analysis
- Hierarchical and Iterative Clustering
- K-Nearest Neighbours
- Discriminant Analysis
- Logistic Regression

Teaching Strategies

The course is taught using a combination of lectures, group projects, and tutorials. Regular visits are made to the workshop to demonstrate the actual machines and processes being discussed. External speakers (from other departments or

companies) are typically invited to give lectures about their specific manufacturing experience and research.

Assessment

Written Exam 2 hours (80%) and Continuous Assessment (20%).

Required textbook

Introduction to Multivariate Analysis, C. Chatfield and A. Collins, Chapman & Hall

Further Information

https://www.scss.tcd.ie/Brett.Houlding/Index/ST3011.html