UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Analisi dei Dati

2021-2-E4102B079

Learning objectives

The course aims to introduce the concept of latent variable and the most important latent variable models . During the lectures will alternate in the laboratory lessons in order to allow you to learn the use of statistical packages and can then apply the techniques learned.

Contents

Causality in statistics

Spurious Correlation

Structural Models with observed variables: path analysis

Several meanings of latent variables

Factor Model

Component analysis and Factor Model

Structural Models with latent variables

Detailed program

Causality in statistics

Spurious Correlation

Structural Models with observed variables: path analysis. Examples

Several meanings of latent variables

Factor Model: Hypothesis. Commonalities: meaning and calculation. Methods to derive factor pattern.Rotating solutions: meaning and methods. Methods of factors estimation. Methods to obtain factor scores. Interpretation of results. Not uniqueness of factor solutions: non identifiability of parameters and indeterminacy of factor scores . Estimation methods and Hypothesis testing. Examples

Differences with the analysis of principal components.

Structural models with latent variables. Links with path analysis and factor models. Solutions and their interpretation. Non uniqueness of solutions. Estimation methods and hypothesis testing.

Prerequisites

No formal prerequisites. It requires, however, knowledge of the content of the following courses: Probablility Calculus, Statistics 1, Informatics Lab, Multivariate statistical analysis, Database Systems

Teaching methods

In the lessons the theoretical notions with many practical examples will be proposed In the laboratories the statistical techniques learned will be applied to resolve problems on real data by means of statistical packages. Lessons and exercises will be recorded on the e-learning platform

Assessment methods

Written test.2 theory question and an applied exercice with a statistical package

Textbooks and Reading Materials

Slides e appunti del corso

Alwin, Duane F.and Robert M. Hauser (1975) “The decomposition of effects in path analysis”. American Sociological Review, vol. 40 (February): 37-40.

Blalock, Hubert M., Jr. (1965) “Path analysis: sociological examples”. American Journal of Sociology 72 (July): 1-16.

Blalock, Hubert M., Jr. (1971)“Path analysis: sociological examples (addenda)”. Pp. 136-8 in Hubert M. Blalock, Jr., (ed.), Causal Models in the Social Sciences. Chicago: Aldine-Atherton.

Duncan, Otis Dudley, David L. Featherman and Beverly Duncan (1971) Socioeconomic Background and Achievement. New York: Academic Press.

Land, Kenneth C., (1969.) “Principles of path analysis”. Pp. 3-37 in Edgar F. Borgatta (ed.), Sociological Methodology, San Francisco: Jossey-Bass.

Saris, W.E., & Stronkhorst, L.H.. (1984). Causal Modelling in Nonexperimental Research. Sociometrical Research Foundation. Amsterdam, The Nederlands.

Werts, C. E., & Linn. R. L. (1970) Path analysis: Psychological examples. *Psychological Bulletin,* ,67, 193-212.

Lawley, D. N. and Maxwell, A.E. (1971) Factor Analysis as a Statistical Method, American Elsevier, New York.

• Hauser, R. M., Goldberger,A. S. The treatment of unobservable variables in path analysis. In H. L. Costner (Ed.), Sociological methodology. London: Jossey-Bass, 1971. In K. G. Jöreskog, & H. Wold (Eds.). Sustems under indirect observation Causality structure prediction New York: North Holland

• • Lawley, D. N. and Maxwell, A. E. (1971) Factor Analysis as a Statistical Method, American Elsevier, New York.

• Hauser, R. M., Goldberger,A. S. The treatment of unobservable variables in path analysis. In H. L. Costner (Ed.), Sociological methodology. London: Jossey-Bass, 1971.

• In K. G. Jöreskog, & H. Wold (Eds.). Systems under indirect observation Causality structure prediction New York: North Holland

Semester

2th semester 2021 1^ cycle

Teaching language

Italian