



CLADAG 2011 Book of Abstracts

8th Scientific Meeting
of the CLAssification and Data Analysis
Group of the Italian Statistical Society

University of Pavia, September 7-9, 2011

Edited by

Paola Cerchiello – Claudia Tarantola

Pavia University Press

Editoria scientifica



CLADAG 2011



CLAssification and Data Analysis Group
of the Italian Statistical Society

CLADAG 2011

Book of Abstracts

8th Scientific Meeting

University of Pavia, September 7-9, 2011

Edited by

Paola Cerchiello – Claudia Tarantola



Pavia University Press

Società italiana di statistica : Gruppo di classificazione e analisi dei dati

Cladag 2011 : book of abstracts : 8th scientific meeting : University of Pavia, September 7-9, 2011 / edited by Paola Cerchiello, Claudia Tarantola. - Pavia : Pavia University Press, 2011. - VIII, 56 p. ; 24 cm.

In testa al front.: Cladag 2011, [Università degli Studi di Pavia], Classification and data analysis group of the Italian statistical society, Società italiana di statistica, AIFIRM.

ISBN 9788896764220

I. CLADAG II. Cerchiello, Paola III. Tarantola, Claudia

1. Analisi Multivariata - Statistica - Congressi - Pavia - 2011

519.535 CDD-22 - Analisi dei dati. Analisi multivariata

© Paola Cerchiello – Claudia Tarantola, 2011 – Pavia
ISBN: 978-88-96764-22-0

Texts published by Pavia University Press in the series “Editoria scientifica” have been peer-reviewed prior to acceptance by the Editorial Board.

No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without written permission from the editors.

Editore / Publisher: Pavia University Press
Edizioni dell'Università degli Studi di Pavia
Via Ferrata, 1 – 27100 Pavia – Italia
<<http://www.paviauniversitypress.it>>

Stampato da / Printed by: Print Service – Strada Nuova, 67 – 27100 Pavia – Italia

Table of Contents

CLADAG 2011 – Program Schedule	IV
Presentation	VII
Committees	VIII
Abstracts (in alphabetical order by author).....	1



CLADAG 2011

09:00 - 09:30	Opening Ceremony (Aula Magna): A. Stella (Rector of the University of Pavia); A. Cattaneo (Mayor of Pavia); S. Ingrassia (SC President); P. Giudici (OC President)			
09:30 - 10:20	Keynote Lecture - M. Titterton: "A review of some hybrid generative-discriminative methods" (Chair: A. Cerioli, Aula Magna)			
10:20 - 10:50	Coffee Break			
Solicited Session	Quality indexes for sensory and consumer science Chair: S. Salini (Room Volta)	Item response theory Chair: T. Di Battista (Room Foscolo)	Latent variable model, causal inference and evaluation Chair: I. Morlini (Room Scarpa)	
10:50 - 11:10	E. Brentari, P. Zuccolotto	L. Bertoli Barsotti, A. Punzo	A. Forcina, S. Modica	
11:10 - 11:30	E. Brentari, R. Levaggi	T. Di Battista, S. Di Zio, C. Ceccatelli, R. Marianacci	L. Grilli R. Varriale	
11:30 - 11:50	P. Amenta, R. Lombardo	M. Matteucci, S. Mignani, B. Veldkamp	T. Agasisti, F. Pennoni, G. Vittadini	
Specialized Session	Advances in Measurement Error Models and Methods Chair: M. Carpita (Room Volta)	Robust Clustering Chair: O. Papaspiliopoulos (Room Foscolo)	Advances in Bayesian structural learning for data analysis Chair: G. Consonni (Room Scarpa)	
11:55 - 12:15	M. Battauz, R. Bellio	D. Perrotta, A. Cerioli, F. Torti	L. La Rocca	
12:15 - 12:35	A. Sarra, L. Fontanella, T. Di Battista, R. Di Nisio	A. Gordaniza, C. Ruwet, L. A. Garcia-Escuder, A. Mayo-Isa	D. Rossell, D. Telesca, V. E. Johnson	
12:35 - 12:55	P. Lovaglio, G. Vittadini	M. Bini, M. Velucchi	R. Silva	
12:55 - 13:10	Discussant: M. Carpita	Discussant: M. Riani	Discussant: G. Consonni	
13:10 - 14:10	Lunch			
Contributed Session	Multivariate Data Analysis Chair: M. D'Esposito (Room Volta)	Classification and Clustering (1) Chair: P. Amenta (Room Magna)	Data Analysis in Economic and Finance (1) Chair: G. Vittadini (Room Scarpa)	Data Analysis in Environmental Sciences Chair: G. Diana (Room Foscolo)
14:10 - 14:25	R. Bellio, N. Soriani	L. Bagnato, F. Greselin	T. Bellini	E. Nissi, A. Rapposelli
14:25 - 14:40	L. Cutillo, I. De Feis, C. Nikolaidou, T. Sapa	I. Morlini, S. Zani	L. Dalla Valle, M. E. De Giuli, C. Manelli, C. T	R. Rotondi, E. Varini, G. Zonno
14:40 - 14:55	G. Fonseca, F. Giummolè, P. Vidoni	R. O'Reilly, S. Wilson, C. Carlow, P. McNich	P. Dellaportas, L. Bottolo	M. Tsuji, K. Horinouchi, Y. Izumoto, T. Sh
14:55 - 15:10	H. Hruschka	I. Vrbik, P. McNicholas	G. Schoier, F. Marsich	
15:10 - 15:25	A. Mazza, A. Punzo	R. Winkler, F. Klawonn, R. Kruse	R. Stecking, K. B. Schebesch	
Specialized Session	New trends in incremental and semi-supervised classification : theoretical issues and applications Chair: P. Kuntz (Room Volta)	Web mining and Web surveys Chair: S. Biffignandi (Room Foscolo)	Scaling procedures for ordinal data and open issues in the measurement of latent variables Chair: G. Boari (Room Scarpa)	
15:30 - 15:50	N. Greffard, F. Picarougne	J. Bethlehem	L. Cappellari	
15:50 - 16:10	R. Lefort, R. Fablet, J.-M. Boucher	A. Bianchi, S. Biffignandi	A. Zanella, G. Boari, A. Bonanomi, G. Cantaluppi	
16:10 - 16:30	C. Salperwyck, V. Lemaire	E. Lorenzini	B. Zumbo	
16:30 - 16:45	Discussant: P. Kuntz	Discussant: S. Biffignandi	Discussant: G. Boari	
14:45 - 17:10	Coffee Break			
Solicited Session	Evaluation of Academic Research Performance: Measurement and data analysis Chair: G. Nicolini (Room Volta)	Multivariate statistics Chair: R. Rocci (Room Foscolo)	Clustering of multivariate functional data: techniques and applications Chair: M. Chioldi (Room Scarpa)	
17:10 - 17:30	F. De Battisti, S. Salini	M. Alfò, I. Rocchetti	M. Chioldi, G. Adelfio, A. D'Alessandro, D. Luzio	
17:30 - 17:50	A. Costantini, M. Franceschet	G. Calò, A. Montanari	A. Guglielmi, F. Leva, A. M. Paganoni, F. Ruggeri, J. Soriano	
17:50 - 18:10	C. Davino, R. Romano	A. Okada, H. Tsurumi	E. Romano, A. Balzanella	
18:15 - 19:30	CLADAG Assembly (AulaFoscolo)			

Thursday, September 8, 2011

Specialized Session	Advances in Student-t based statistical modeling <i>Chair: F. Greselin (Room Foscolo)</i>	Analysis of asymmetric relationships <i>Chair: A. Okada (Room Volta)</i>	Analysis and classification of non standard data <i>Chair: G. Ragozini (Room Scarpa)</i>
08:30 - 08:50	A. Kleefeld, V. Brazauskas	G. Gove	A. M. Alonso - D. Casado - S. López-Pintado - J. Romo
08:50 - 09:10	P. McNicholas	M. de Rooij	A. Balzanella, L. Rivoli, R. Verde
09:10 - 09:30	R. Fucci, A.C. Monti	M. Nakai	P. Secchi, S. Vantini, V. Vitelli
09:30 - 09:45	<i>Discussant: F. Greselin</i>	<i>Discussant: A. Okada</i>	<i>Discussant: G. Ragozini</i>
Solicited Session	Classification problems in finance <i>Chair: D. Zappa (Room Foscolo)</i>	Modern computational methods for classification of <i>Chair: F. Laurini (Room Volta)</i>	Regression models for spatial data <i>Chair: M. Mezzetti (Room Scarpa)</i>
09:50 - 10:10	A. Bramante, A. Cipollini, A. Manzini	M. Cattelan, C. Varin	R. Chambers, E. Dreassi, N. Salvati
10:10 - 10:30	G. Gabbi	N. Chopin, P. Jacob, O. Papaspiliopoulos	M. Bevilacqua, C. Gaetan, E. Porcu
10:30 - 10:50	E. Otranto	P. Pauli	S. Leorato, M. Mezzetti
10:50 - 11:15	Coffee Break		
Solicited Session	Statistical methods for the assessment of universities <i>Chair: L. Grilli (Room Foscolo)</i>	Statistical issues and inferential results in CUB models <i>Chair: D. Piccolo (Room Volta)</i>	Symbolic data analysis <i>Chair: A. Irpino (Room Scarpa)</i>
11:15 - 11:35	M. Attanasio, G. Boscaino, V. Capursi, A. Plaia	S. Bonnini, L. Salmaso, F. Solmi	E. Diday
11:35 - 11:55	M. Bini, L. Grilli	L. Deldossi, R. Paroli	C. Drago, C. Lauro, G. Scepi
11:55 - 12:15	P. Cerchiello	M. Iannario	R. Verde, A. Irpino
Contributed Session	Classification and Data Analysis (1) <i>Chair: S. Zaccarin (Room Foscolo)</i>	Data Analysis in Economic and Finance <i>Chair: S. Ingrassia (Room Magna)</i>	Latent Class Model, Classification and <i>Chair: D. Calò (Room Scarpa)</i>
12:20 - 12:35	J. Andrews, P. D. McNicholas	A. Dridi, M. ElGhourabi, M. Limam	S. Bacci, F. Bartolucci, M. Gnaldi
12:35 - 12:50	S. Bolasco, P. Pavone	D. F. Iezzi, M. Mastrangelo, S. Sarlo	F. Bartolucci, G. E. Montanari, S. Pandolfi
12:50 - 13:05	F. Campobasso, A. Fanizzi	A. Lourme, C. Biernacki	F. Bassi, M. Croon, A. Pittarello
13:05 - 13:20	F. Caruso, G. Giuffrida, C. Zarba	F. Telmoudi, M. El Ghourabi, M. Limam	M. Gnaldi, F. Bartolucci, S. Bacci
13:20 - 13:35	A. Umlu, A. Sargin		I. Sullis
13:35 - 14:40	Lunch		
Specialized Session	Genetic algorithms and surveys <i>Chair: M. Gasparini (Room Foscolo)</i>	Hidden Markov models: theory developments and <i>Chair: A. Maruotti (Room Volta)</i>	Statistics for Shape, Image and Functional data <i>Chair: R. Verde (Room Scarpa)</i>
14:40 - 15:00	M. Ballin, G. Barcaroli	J. Bulla	L. Fontanella, L. Ippoliti, P. Valentini, F. Festa
15:00 - 15:20	R. Di Manno, M. Scanu, P. Vicard	F. Lagona, M. Picone	S.A. Gattone
15:20 - 15:40	D. Zardetto, M. Scannapieco	R. Langrock, I. L. MacDonald, Walter Zucchini	C. Glasbey
15:40 - 15:55	<i>Discussant: M. Gasparini</i>	<i>Discussant: A. Maruotti</i>	<i>Discussant: R. Verde</i>
16:00 - 16:40	Keynote Lecture - F. Palumbo "Exploratory analysis for interval-valued data" (Chair: O. Papaspiliopoulos , Aula Magna)		
16:40 - 17:05	Coffee Break		
Contributed Session	Classification and Data Analysis (2) <i>Chair: P. Bove (Room Foscolo)</i>	Classification and data Analysis (2) <i>Chair: S. Figini (Room Volta)</i>	Service evaluation and customer <i>Chair: M. Ballin (Room Scarpa)</i>
17:05 - 17:20	L. Bocci, M. Vichi	F. Crippa, M. Marelli	C. Capuano, D. De Stefano, A. Del Monte,
17:20 - 17:35	B. Franczak, R. Browne, P. McNicholas	R. D'Agata, V. Tomaselli	C. Liberati, P. Mariani
17:35 - 17:50	F. Martella, D. Vicari, M. Vichi	L. Dancelli, M. Manisera, M. Vezzoli	F. Musella, P. Vicard
17:50 - 18:05	E. Sironi	F. De Natale, L. Fattorini, S. Franceschin, P.	M. Scagliarini, S. Evangelisti
18:05 - 18:20	A. Tarsitano, M. Falcone	N. Solaro	C. Tarantola, P. Vicard, I. Ntzoufras
20:00	Social Dinner		

Friday, September 9, 2011

Specialized Session	Misura integrata dei rischi (in collaborazione con Chair: M. Anolli (Room Foscolo))	Classification methods for time dependent data Chair: C. Perna (Room Scarpa)	Statistical methods for high-dimensional biological Chair: A. Montanari (Room Volta)
09:00 - 09:20	M. Bignami	G. Cubadda, B. Guardabascio, A. Hecq	M.R. Oelker, A. L. Boulesteix
09:20 - 09:40	S. Figini	M. Gerolimetto, I. Procidano	D. Causeur
09:40 - 10:00	D. Mignacca	M. Niglio, G. Storti, C. Vitale	L. Trinchera, E. Le Floch, A. Tenenhaus
10:00 - 10:15	<i>Discussant: M. Anolli</i>	<i>Discussant: C. Perna</i>	<i>Discussant: A. Montanari</i>
10:20 - 11:10	Keynote Lecture - V. Batagelj "Clustering of large data sets of mixed units" (Chair: M. Vichi, Aula Magna)		
11:10 - 11:30	Coffee Break		
Solicited Session	Integrating administrative data and large scale surveys Chair: M. Scanu (Room Foscolo)	New trends in complexity reduction in multivariate Chair: G.D. Costanzo (Room Scarpa)	Advanced methods in network analysis Chair: M. P. Vitale (Room Volta)
11:30 - 11:50	P.L. Conti, D. Marella	C. Cappelli, F. Di Iorio, P. D'Urso	V. Amati
11:50 - 12:10	M. D'Orazio	F. Domma, F. Condino	D. De Stefano
12:10 - 12:30	B. Vantaggi, A. Capotorti	D. Vicari, M. Alfò	M. van Duijn
12:30 - 13:30	Lunch		
Contributed Session	Data Analysis in Economic and Finance Chair: M. Costa (Room Foscolo)	Data Analysis (1) Chair: D. Vicari (Room Magna)	Classification and Clustering (3) Chair: P. Giudici (Room Volta)
13:45 - 14:00	R. Castellano, G. Punzo	S. Calligaris, F. Mecatti	C. Agostinelli, M. Romanazzi
14:00 - 14:15	F. Della Ratta Rinaldi, F. Gallo, B. Lorè	T. Di Battista, S. Di Zio, C. Ceccatelli, R. Ma	B. Arpino, F. Billari, M. Cannas
14:15 - 14:30	S. Lombardi, F. Verrecchia	G. D'Epifanio	A. Guglielmi, F. Ieva, A. M. Paganoni, F. Rui
14:30 - 14:45	S. Minotti, G. Spedicato	G. Giuliani, R. Lima, R. Ranaldi	L. Scrucca
14:45 - 15:00		A. Simonetto, M. Carpita	S. Subedi, P. McNicholas
15:15 - 17:30	Symposium: E. Giovannini (ISTAT), N. Pagnoncelli (IPSOs), E. Rocca (CREVAL), M. Degli Esposti (VIA-Academy), P. Giudici (UNIPV) B. Marchione (AICUN)		
17:30	Closing ceremony: S. Ingrassia, P. Giudici		

Multidimensional Latent Class IRT Models: An Extension to Items with Ordinal Responses

Silvia Bacci – Francesco Bartolucci – Michela Gnaldi

University of Perugia, Italy, e-mail: {silvia.bacci; bart; michela.gnaldi}@stat.unipg.it

We formulate a class of Item Response Theory models which may be used to assess the dimensionality of a set of items with ordinal responses. This class of models extends an existing one for items with dichotomous responses, which being multidimensional, represents the latent traits by a random vector. This vector has a discrete distribution with support points corresponding to different latent classes. Several parameterisations may be adopted in the extended class of models for the conditional distribution of the response variables given the abilities, such as those adopted in the Rating Scale model, in the Partial Credit model, and in the Graded Response model. In order to illustrate the proposed models, we analyze data coming from a study about levels of anxiety and depression in oncological patients, for which a Graded Response parameterisation is adopted.

Model-Based Clustering and Classification via Patterned Covariance Analysis

Luca Bagnato – Francesca Greselin

University Milano-Bicocca, Italy, e-mail: {luca.bagnato; francesca.greselin}@unimib.it

This work deals with the classification problem in the case that groups are known and both labeled and unlabeled data are available. The classification rule is derived using Gaussian mixtures, with covariance matrices fixed according to a multiple testing procedure, which allows to choose among four alternatives: heteroscedasticity, homometroscedasticity, homotroposcedasticity, and homoscedasticity. The mixture models are then fitted using all available data (labeled and unlabeled) and adopting the EM and the CEM algorithms. Applications on real data are provided in order to show the classification performance of the proposed procedure.

The Genetic Algorithm: Applications for the Optimisation of the Sampling Strategy

Marco Ballin – Giulio Barcaroli

Istituto Nazionale di Statistica (ISTAT), Rome, Italy, e-mail: {ballin; barcarol}@istat.it

Sampling design and estimation are the two components that lead to the definition of the sampling strategy. It is quite common that both components are based on a partition of the population and sample units in homogeneous classes: sampling strata and reference group for the calibration model. In this paper it is shown as the genetic algorithm can help in the search of the optimal solution in both steps: for sampling design, in finding the best stratification that ensures efficiency; in estimation, by determining the best reference group, the one that guarantees the minimum sampling variance and/or minimum bias due to non response. While this approach has already been studied and applied in ISTAT real surveys for sampling design, the case of estimation still needs a practical verification.

The 8th Biennial International Meeting of the CLAssification and Data Analysis Group (CLADAG) of the Italian Statistical Society was hosted by the University of Pavia within the celebration of its 650th anniversary, from September 7th to September 9th, 2011.

The present book contains the abstract of the papers presented during the meeting. The four pages version of the papers is contained in the USB pen, with an ISBN code as well. All papers were reviewed.

CLADAG promotes advanced methodological research in multivariate statistics with a special interest in Data Analysis and Classification. It supports the interchange of ideas in these fields of research, including the dissemination of concepts, numerical methods, algorithms, computational and applied results.

CLADAG is a member of the International Federation of Classification Societies (IFCS). Among its activities, CLADAG organizes a biennial international scientific meeting, schools related to classification and data analysis, publishes a newsletter and cooperates with other member societies of the IFCS in the organization of their conferences.

The scientific program of the meeting covered the following topics:

- Classification theory
- Multivariate data analysis
- Proximity structure analysis
- Software developments
- Applied classification and data analysis

Previous CLADAG meetings were held in Pescara (1997), Roma (1999), Palermo (2001), Bologna (2003), Parma (2005), Macerata (2007) and Catania (2009).

Texts published by Pavia University Press in the series “Editoria scientifica” have been peer-reviewed prior to acceptance by the Editorial Board. www.paviauniversitypress.it/scientifica

€ 9,80



Pavia University Press

ISBN 978-88-96764-22-0



9 788896 764220