



Vereniging voor Ordinatie en Classificatie / Dutch-Flemish Classification Society

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VOC-home page: <http://www.voc.ac>

4th VOC Conference

May 29th, 2015

Nijmegen

10.00	VOC Annual Members Meeting
10.30	Welcome and registration
11.00	Submitted paper session 1
12.10	Lunch
13.10	Keynote address: Morten Arendt Rasmussen, <i>Notes on some ideas from the Netherlands - seen from a Danish perspective</i>
14.10	Coffee break
14.25	Submitted paper session 2
15.55	Coffee break
16.10	Submitted paper session 3
17.30	Announcement of the PhD Presenter Award Winner and drinks

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Registration details for the 4th VOC Conference

Those who would like to participate in the 4th VOC Conference are welcome and are kindly requested to register through our website <http://www.voc.ac> (go to 'meeting'). Participation costs 15 Euros for VOC members and PhD students, and 35 Euros for others (to be paid upon arrival). In the conference fee a lunch is included. For the price of 20 Euros, people can become a member of the VOC (this can be arranged during the enrollment for the conference).

From the President

The last two years were very special for the VOC. In 2013 we successfully organized the IFCS meeting in Tilburg, and in 2014 we celebrated our 25th anniversary with a very interesting conference at Rolduc. This year we won't have such big VOC events, but "just" our annual new style VOC conference. The upcoming annual meeting will be hosted by Jeroen Jansen from the Radboud University in Nijmegen. Together with the host, the VOC board has been able to setup a very interesting program. We are very pleased to see that the interest in presenting ongoing research at our meetings is growing, especially among PhD student members. The program consists of 6 presentations by PhD students, 4 by senior VOC members, and a very interesting keynote by Morten Arendt Rasmussen from Copenhagen University. More details about the program can be found in this newsletter.

After two terms of three years, our treasurer Berrie Zielman will leave the board of the VOC. I would like to thank Berrie for his excellent service.

I hope to see many of you next week in Nijmegen.

Jeroen Vermunt

Program 4th VOC Conference (Nijmegen, May 29th, 2015)

Submitted paper session 1 (11.00-12.10)

- | | |
|----------------------|--|
| Gerjen H. Tinnevelt* | Single cell analysis with DAMACY: Discriminant analysis of multi-aspect cytometry |
| Edoardo Saccenti | Probabilistic networks of blood metabolites in healthy subjects as indicators of latent cardiovascular risk |
| Geert Postma | Pseudo sample trajectories for the detection of variable interaction in Dissimilarity Partial Least Squares models |

Keynote address (13.10-14.10)

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|---------------------|---|
| Morten A. Rasmussen | Notes on some ideas from the Netherlands - seen from a Danish perspective |
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Submitted paper session 2 (14.25-15.55)

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|-----------------------|---|
| Lisa Doove* | A novel method for estimating optimal tree-based treatment regimes in randomized clinical trials |
| Mattis van den Bergh* | Divisive latent class analysis applied to social capital |
| Alwin Stegeman | Direct-fitting common factor analysis |
| Tom F. Wilderjans | CLV3W: Clustering of variables around latent components extended to conventional sensory profiling three-way data |

Submitted paper session 3 (16.10-17.20)

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|-----------------------|--|
| Dereje W. Gudicha* | Power analysis for the likelihood-ratio test in latent Markov models: short-cutting the bootstrap p-value based method |
| Roberto Di Mari* | Three-step estimation approach in the context of latent Markov modeling with covariates |
| Geert van Kollenburg* | Resampling methods in Latent Class Analysis |

Announcement of the PhD Presentation Award (17:30)

() applicant for the VOC Presenter Award*

Publications

Bain, P. G., Kroonenberg, P. M., & Kashima, Y. (2015). Cultural beliefs about societal change: A three-mode principal component analysis in China, Australia, and Japan. Cultural beliefs about societal change. *Journal of Cross-Cultural Psychology*, *46*, 635–651. doi: 10.1177/0022022115578005

Bartlema, A., Lee, M. D., Wetzels, R., & Vanpaemel, W. (2014). A Bayesian hierarchical mixture approach to individual differences: Case studies in selective attention and representation in category learning. *Journal of Mathematical Psychology*, *59*, 132–150. doi:10.1016/j.jmp.2013.12.002

Boomgaard, P., & Kroonenberg, P. M. (2015). Rice, sugar, and livestock in Java, 1820-1940: Geertz's Agricultural Involvement 50 years later. In F. Bray, P. A. Coclanis, E. Fields-Black, & B. Schäfer (Eds.), *Rice: Global networks and new histories* (pp. 56-83). New York, USA: Cambridge University Press.

Bringmann, L. F., Lemmens, L. H. J. M., Huibers, M. J. H., Borsboom, D., & Tuerlinckx, F. (2015). Revealing the dynamic network structure of the Beck Depression Inventory-II. *Psychological Medicine*, *45*, 747-757. doi:10.1017/S0033291714001809

Brose, A., De Roover, K., Ceulemans, E., & Kuppens, P. (2015). Older adults' affective experiences across 100 days are less variable and less complex than younger adults'. *Psychology and Aging*, *30*, 194-208. doi:10.1037/a0038690

Debeer, D., Buchholz, J., Hartig, J., & Janssen, R. (2014). Student, school, and country differences in sustained test-taking effort in the 2009 PISA reading assessment. *Journal of Educational and Behavioral Statistics*, *39*, 502-523. doi:10.3102/1076998614558485

Doove, L. L., Dusseldorp, E., Van Deun, K., & Van Mechelen, I. (2014). A comparison of five recursive partitioning methods to find person subgroups involved in meaningful treatment-subgroup interactions. *Advances in Data Analysis and Classification*, *8*, 403-425. doi:10.1007/s11634-013-0159-x

Doove, L. L., Van Buuren, S., & Dusseldorp, E. (2014). Recursive partitioning for missing data imputation in the presence of interaction effects. *Computational Statistics & Data Analysis*, *72*, 92-104. doi:10.1016/j.csda.2013.10.025

Dusseldorp, E., Doove, L., & Van Mechelen, I. (in press). Quint: An R package for identification of subgroups of clients who differ in which treatment alternative is best for them. *Behavior Research Methods*.

Eilers, P., & Kroonenberg, P. M. (2014). Modeling and correction of Raman and Rayleigh scatter in fluorescence landscapes. *Chemometrics and Intelligent Laboratory Systems*, *130*, 1–5.

Hamaker, E. L., Ceulemans, E., Grasman, R. P. P., & Tuerlinckx, F. (in press). Modeling affect dynamics: State-of-the-art and future challenges. *Emotion Review*.

Hendrickx, D. M., Aerts, H. J., Caiment, F., Clark, D., Ebbels, T. M., Evelo, C. T., ... Kleinjans, J. C. (2015). diXa: a data infrastructure for chemical safety assessment. *Bioinformatics*, *31*(9), 1505-1507.

Hendrickx, D. M., Boyles, R. R., Kleinjans, J. C., & Dearth, A. (2014). Workshop report: Identifying opportunities for global integration of toxicogenomics databases, 26-27 June 2013, Research Triangle Park, NC, USA. *Archives of Toxicology*, *88*(12), 2323-2332. doi: 10.1007/s00204-014-1387-3

Hendrickx, D. M., Jennen, D. G., Briedé, J. J., Cavill, R., de Kok, T. M., & Kleinjans, J. C. (in press). Pattern recognition methods to relate time profiles of gene expression with phenotypic data: a comparative study. *Bioinformatics*. doi: 10.1093/bioinformatics/btv108

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methods. *Frontiers in Psychology*, 5, 1495, 1–13. doi:10.3389/fpsyg.2014.01495

Kroonenberg, P. M. (2014). Foreword. In E. Beh, & R. Lombardo (Eds.), *Correspondence analysis. Theory, practice and new strategies* (pp. xv – xvi). Chichester, UK: Wiley.

Kroonenberg, P. M. (2014). History of multiway component analysis and three-way correspondence analysis. In J. Blasius, & M. J. Greenacre (Eds.), *Visualization and verbalization of data* (pp. 77–94). Boca Raton, FL, USA: Chapman & Hall/CRC.

Kroonenberg, P. M. (2015). Three-mode component and scaling models. In B. S. Everitt, & D. Howell (Eds.), *Encyclopedia of statistics in behavioral science – 2nd edition* (pp. 2032-2044). Chichester, UK: Wiley.

Kroonenberg, P. M., & Van Ginkel, J. R. (2012). Combination rules for multiple imputation in three-way analysis illustrated with chromatography data. *Current Analytical Chemistry*, 8, 224-235.

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Lem, S., Kempen, G., Ceulemans, E., Onghena, P., Verschaffel, L., & Van Dooren, W. (in press). Combining multiple external representations and refutational text: An intervention on learning to interpret box plots. *International Journal of Science and Mathematics Education*.

Lombardo, R., Beh, E., & Kroonenberg, P. M. (in press). Modelling trends in ordered correspondence analysis using orthogonal polynomials. *Psychometrika*. doi:10.1007/s11336-015-9448-y

Maes, P.-J., Van Dyck, E., Lesaffre, M., Leman, M., & Kroonenberg, P. M. (2014). A dimensional model for the study of the coupling of action and perception in musical meaning formation: a case study with Brahms' First Piano Concerto. *Music Perception*, 32, 67–84.

Magis, D. (2015). A note on weighted likelihood and Jeffreys modal estimation of proficiency levels in

polytomous item response models. *Psychometrika*, 80, 200-204. doi:10.1007/S11336-013-9378-5

Magis, D. (in press). Efficient standard error formulas of ability estimators with dichotomous item response models. *Psychometrika*.

Magis, D. (2014). On the asymptotic standard error of a class of robust estimators of ability in dichotomous item response models. *British Journal of Mathematical and Statistical Psychology*, 67, 430-450. doi:10.1111/bmsp.12027

Magis, D., & De Boeck, P. (2014). Type I error inflation in DIF identification with Mantel-Haenszel: An explanation and a solution. *Educational and Psychological Measurement*, 74, 713-728. doi:10.1177/0013164413516855

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Rodenburg-Vandenbussche, S., Pieterse, A. H., Kroonenberg, P. M., Scholl, I., Van der Weijden, T., Luyten, G. P. M., ... Stiggelbout, A. M. (in press). Dutch translation and psychometric testing of the SDM-Q-9 and SDM-Q-DOC in patients from primary and secondary care. *PLOS One*.

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Steege, S., Dewitte, L., Tuerlinckx, F., & Vanpaemel, W. (2014). Measuring the crowd within again: A pre-registered replication study. *Frontiers in Psychology*, 5, 786, 1-8. doi:10.3389/fpsyg.2014.00786

Timmerman, M. E., Hoefsloot, H. C. J., Smilde, A. K., & Ceulemans, E. (in press). Scaling in ANOVA-simultaneous component analysis. *Metabolomics*. doi:10.1007/s11306-015-0785-8

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Van Rijn, S., Kroonenberg, P. M., Ziermans, T., & Swaab, H. (in press). The Schizotypal Personality Questionnaire for Children (SPQ-C-D): An evaluation in the Dutch population. *Advances in Psychiatry*.

Verdonck, S., Meers, K., & Tuerlinckx, F. (in press). Efficient simulation of diffusion-based choice RT models on CPU and GPU. *Behavior Research Methods*.

Verdonck, S., & Tuerlinckx, F. (2014). The Ising Decision Maker: A binary stochastic network for choice response time. *Psychological Review*, *121*, 422-462. doi:10.1037/a0037012

Voorspoels, W., Bartlema, A., & Vanpaemel, W. (2014). Can race really be erased? A pre-registered replication study. *Frontiers in Psychology*, *5*, 1035, 1-7. doi:10.3389/fpsyg.2014.01035

Wilderjans, T. F., & Cariou, V. (in press). CLV3W: A clustering around latent variables approach to detect panel disagreement in three-way conventional sensory profiling data. *Food Quality and Preference*.

Wilderjans, T. F., Lambrechts, G., Maes, B., & Ceulemans, E. (2014). Revealing interdyad differences in naturally occurring staff reactions to challenging behaviour of clients with severe or profound intellectual disabilities by means of Clusterwise Hierarchical Classes Analysis (HICLAS). *Journal of Intellectual Disability Research*, *58*, 1045-1059. doi:10.1111/jir.12076

Willemsen, A. M., Hendrickx, D. M., Hoefsloot, H. C., Hendriks, M. M., Wahl, S. A., Teusink, B., ... van Kampen, A. H. (2015). MetDFBA: incorporating time-resolved metabolomics measurements into dynamic flux balance analysis. *Molecular BioSystems*, *11*(1), 137-45.

Financial Report for 2014

Revenue			Expenditure	
Member contributions	43	860	Payment transaction costs	94,16
Overdue membership fees		280	Hosting website	121
VOC conference (Leiden)		200	VOC conference (Leiden)	839,70
Jubilee meeting		4445	Jubilee meeting: Rolduc	5175,65
Interest savings account		32,8	Jubilee meeting: invited speakers	1011,83
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Total		5817,80	Total	7242,34
Debet			Credit	
Balance ING account		1202,55	Accounts payable	0
Balance savings account		2817,37	Equity	4019,92
<hr/>			<hr/>	
Total		4019,92	Total	4019,92

Notes to the balance sheet

- (1) Contributions from 43 members have been collected in 2014
- (2) In 2014 we collected 280 euro's of overdue membership fee's
- (3) The operations of the VOC resulted in a loss of 1424,54 euro's.
This is due to few paying members (17) attending the Jubilee meeting.
- (4) An overview of the evolution of the equity
 - 2014 €4019,92
 - 2013 €5444,46
 - 2012 €5524,70
 - 2011 €6194
 - 2010 €7621
 - 2009 €8189
 - 2008 €6248
 - 2007 €5914
 - 2006 €6869
 - 2005 €6057
 - 2004 €5019
 - 2003 €6795
 - 2002 €6408
 - 2001 €5898
 - 2000 €5731
 - 1999 €4871
 - 1998 €5100

Annual Report of the Secretary for the year 2014

1. Number of members

The VOC started end 2013 with 134 members and counted 120 members at the end of 2014. Seven memberships were terminated, eight members could not be contacted (inactive e-mail address), and there was one new member registered. In 2014, 43 members paid contribution.

2. Board

The Board of the VOC was composed as follows in 2014:

Jeroen Vermunt	President
Katrijn Van Deun	Secretary
Berrie Zielman	Treasurer
Tom Wilderjans	Newsletter Editor
Ralph Rippe	Webmaster

The Board met once in 2014, together with Paul Eilers. The main topic was the organization of the Jubilee Meeting in 2014.

3. Activities

The main activities of the VOC were, first, the third VOC conference and, second, the Jubilee meeting.

The third VOC Conference took place at Leiden University (The Netherlands) on the 9th of May 2014 with a full day program, including nine contributions by VOC members and a keynote speech from Arthur Tenenhaus (Supélec, France) "Regularized Generalized Canonical Correlation Analysis for Multiblock or Multigroup Analysis". At this occasion, a best student presentation award was given to Lianne Ippel (Tilburg University, Netherlands) who presented a paper 'On the Implementation and Empirical Evaluation of Streaming Shrinkage Factors with Applications in Predicting Non Response'. The conference had approximately 25 participants.

The VOC celebrated its 25th anniversary with a Jubilee Meeting on November 6-7, 2014 in the Abbey Hotel Rolduc at Kerkrade (The Netherlands). We had an impressive program with excellent contributions covering both theory and applications of ordination and classification with a broad spectrum of applications: Daniel Oberski (Model fit evaluation by sensitivity analysis), Lianne Ippel (Estimating multi-level models in data-streams), Jeroen Jansen (Revealing the information within Flow Cytometry data using advanced and dedicated Chemometrics), Marieke Timmerman (Unraveling multivariate effects resulting from an experimental design), Paul Eilers (Generalized

exponential tilting), Jelle Goeman (Two folklores: ridge regression versus the lasso), Willem Heiser (From Preference Mapping to Preference Learning, with an Example of a Prediction Tree for Rankings), Lieven de Lathauwer (Tensor decompositions: golden tools for data mining), Christian Hennig (Flexible parametric bootstrap for testing homogeneity against clustering and assessing the number of clusters), Marco Riani (Robust Modern Multivariate Data Analysis and Classification), Patrick Groenen (Some Recent Biplot Approaches), and Denny Borsboom (All quiet on the psychometric front? Goals and challenges for 21st century psychometrics).

4. Publicity

The newsletter appeared once. Both the third VOC conference and the Jubilee meeting were also announced to non-VOC members, using the IFCS newsletter, the VVS-site and mailing lists (IOPS, BBC, ICS).

Minutes of the VOC Annual Members Meeting (May 9, 2014, Leiden)

1. Opening of the meeting

The president, Jeroen Vermunt, opens the meeting.

2. Minutes of the previous meeting

The minutes of the previous meeting were approved.

3. Annual Report

- Contributions by members

The following actions will be taken to account for the backlog in the contributions. Non-student members who did not contribute in 2013 will be asked to contribute both for 2013 and 2014 (before the summer). Non-student members who contributed in 2013 will be asked to renew their membership by contributing for 2014 (also before the summer). In a next step, members who did not contribute in 2012 and 2011 will be asked to do so.

-Miscellaneous

As an alternative to creating a LinkedIn group for the VOC, the system that underlies the VOC website is considered. This system includes the option to create a mailing list (with control of who can enter the system and who can sent/forward messages). It is proposed to automatically subscribe the VOC members to this mailing list with the option to unsubscribe.

-Evaluation of the new format of the VOC meetings

The previous format of the VOC meetings was one with two thematic meetings per year. For these meetings the VOC board invited speakers (consisting both of members and non-members). The new format is based on an annual conference with contributions by the VOC members and one invited keynote speaker. The main motivation for the new format was the decline in the number of participants (approximately 25 participants). The new style conferences attracts approximately the same number of participants. It is suggested to combine both styles in a hybrid format with both an organized thematic session and contributions by VOC members.

4. Financial Report

There is a decline in the financial reserve of the VOC, mainly because of the backlog in the contributions.

5. Cash Committee

Edith Nijenhuis has controlled the accounts together with Paul Eilers: The accounts are in order. The backlog decreased somewhat. Suggestions made to improve the payments of the contributions are: 1) to collect the contributions at a single moment (to make follow-up by the treasurer easier) and just before the conference (this is the period that the VOC is most active and the members involved) and 2) to make paying easier by making payments possible through the VOC website.

Discharge is approved by the members of the meeting. The new audit committee for the following two years consists of Elise Dusseldorp and Lianne Ippel.

6. Composition of the board

The secretary (Katrijn Van Deun) takes note of the fact that Tom Wilderjans can continue as Newsletter Editor and that Ralph Rippe becomes the webmaster of the VOC, both for a term of three years; the President (Jeroen Vermunt) takes note of the fact that Katrijn Van Deun can continue as secretary of the VOC for another three years. The board is still looking for new board members.

7. Miscellaneous

Elise Dusseldorp can be contacted for communication of VOC activities to the VVS.

8. Round of questions

For the forthcoming IFCS conference (Bologna, 2015) Jeroen Vermunt – who is member of the IFCS scientific program committee – inquires if there are VOC members interested in organizing a thematic session with invited speakers (not all VOC members). Daniel Oberski and Elise Dusseldorp are interested to do so.

9. Closure of the meeting

Jeroen Vermunt closes the meeting.

Agenda for the VOC Annual Members Meeting (May 29, 2015, Nijmegen)

1. Opening of the Members Meeting

2. Minutes of the Members Meeting 9th May 2014

The Minutes of this Meeting are included in this Newsletter (see p. 8).

3. Annual Report of the Secretary on the year 2014

The Annual Report is included in this Newsletter (see p. 8).

4. Financial report of the treasurer on the year 2014

The Financial Report is included in this Newsletter (see p. 7).

Report of the cash committee (Elise Dusseldorp and Lianne Ippel).

Appointment of a new cash committee.

5. Composition of the Board

The board is composed of the following members (with their remaining term, in years, between brackets):

- Jeroen Vermunt, President (1)
- Katrijn Van Deun, Secretary (2)
- Tom Wilderjans, Newsletter Editor (2)
- Ralph Rippe, Webmaster (2)
- Berrie Zielman, Treasurer (0)

The term of Berrie Zielman ends. Candidates for this position can register up to 24 hours before the meeting with the secretary.

The board is looking for additional members. Candidates may contact the President before the meeting. The members may give their opinion during the meeting.

6. Questions before closure of the meeting

7. Closure of the Members Meeting

Meetings

The 2015 conference of the International Federation of Classification Societies (IFCS) will be hosted by the University of Bologna 'Alma Mater Studiorum' (Italy) from July 6 to July 8, 2015. The conference will include a president's invited session and a presidential address, keynote presentations, invited presentations, invited and contributed symposia, and oral and poster presentations. The opening session will further feature the presentation of the awards. For more information, go to <http://ifcs.boku.ac.at/ifcs2015>

IASC promotes the 6th International Workshop on Compositional Data analysis (CoDaWork 2015) that will be held in L'Escala (Girona, Spain) from June 1-5. CoDaWork 2015 offers a forum of discussion for people concerned with the statistical treatment and modelling of compositional data or other constrained data sets, and the interpretation of models or applications involving them. The primary goal of the workshop is to identify important potential lines of future research and gain insight as to how they might be tackled. All necessary details concerning registration and abstract submission are available at the conference website <http://www.compositionaldata.com/codawork2015/>

The Applied Bayesian Statistics School (ABS15) will take place June 8-12 in Como, Italy. The topic chosen for the 2015 school is Modern Bayesian Methods and Computing for the Social Sciences. The lecturer is Professor Jeff Gill, Washington University, USA. This course covers the theoretical and applied foundations of Bayesian statistical analysis with an emphasis on computational tools for Bayesian hierarchical models. For more information, go to www.mi.imati.cnr.it/conferences/abs15.html

The statistic department of Agrocampus and the data mining group of the french statistical society organize the International Conference on Missing Values and Matrix Completion (MissData). The conference will take place in Rennes (France) from 18 to 19 June 2015 at Agrocampus Ouest. The objective of this conference is to spotlight the latest research in missing values and matrix completion. We aim to bring together theoretical and applied researchers from different fields of application such as in social-science, genetics, medical analysis, survey, collaborative filtering, image reconstruction, etc. The program

comprises R tutorials, invited lectures and a lively poster session during the reception. Awards will be given to up to three posters. The invited speakers are some of the main contributors on the topic from different fields: Mouna Akacha (Novartis, Switzerland), Christophe Biernaki (University Lille 1, France), Stefan van Buuren (University of Utrecht, the Netherlands), John W. Graham (Pennsylvania State University, US), David Haziza (Montreal University, Canada), Olga Klopp (Paris Ouest University, France), Roderick Little (University of Michigan, US), Joseph L. Schaefer (Census Bureau, Washington, US), Shaun Seaman (Medical Research Council Biostatistics Unit, UK), Pierre Vanderghyest (EPFL, Switzerland), Recai Yucel (University Albany, US). For more information, go to <http://missdata2015.agrocampus-ouest.fr/infoglueDeliverLive/>

The European Conference on Data Analysis (ECDA2015: Data Science: Foundations, Methods and Applications) will be organized September 2-4 at the University of Essex in Colchester UK. For more information, go to <http://ecda2015.com/>

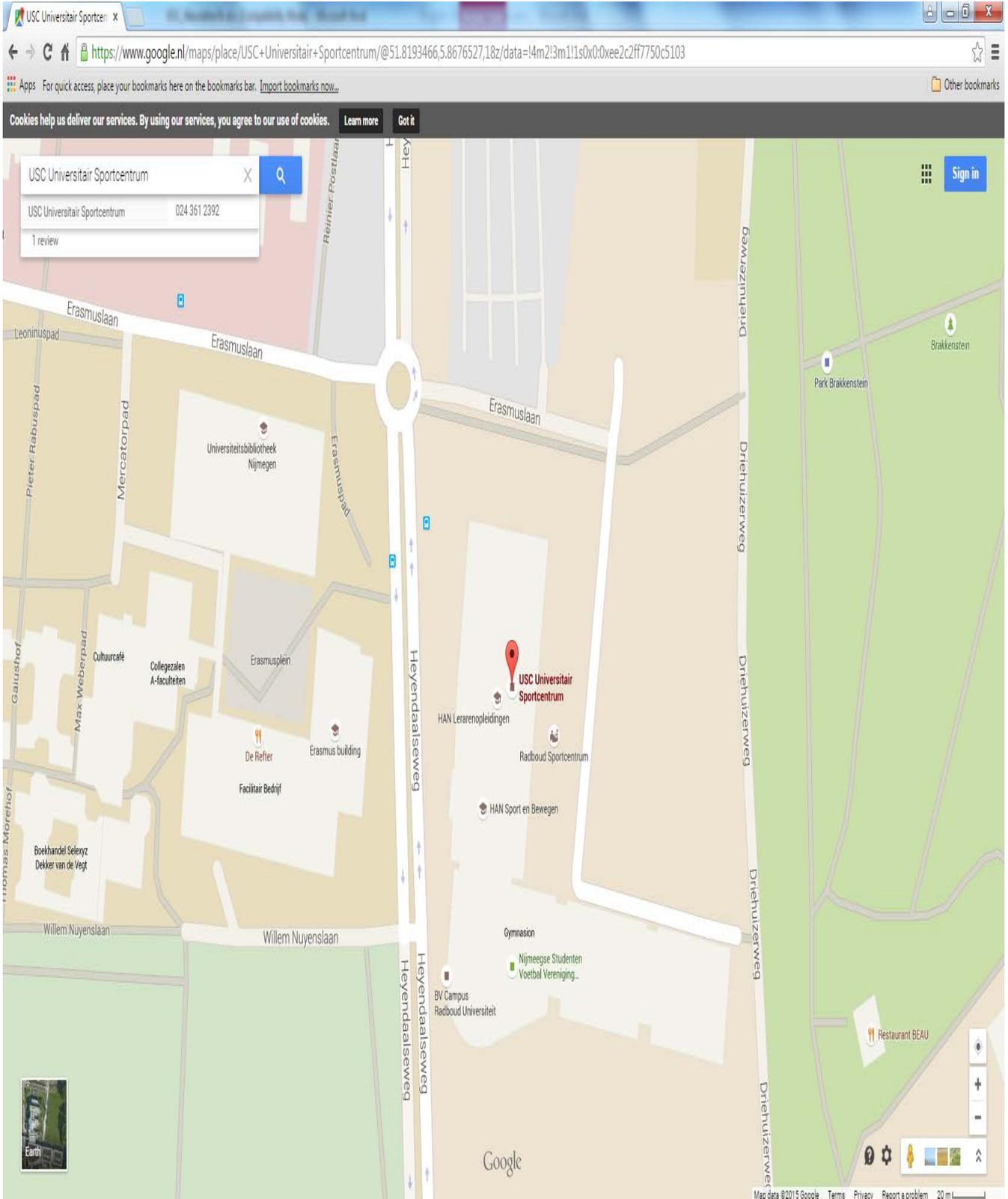
The 7th international CARME Conference on Correspondence Analysis and Related Methods will be organized 20-23 September 2015 in Naples, Italy. The conference will be followed by a workshop on the Singular Value Decomposition (SVD) that will take place 24-25 September 2015 at Procida Island. The CARME conference is the premium meeting for research into multidimensional data analysis (see www.carme-n.org/carme2015). The SVD workshop, with guest speaker Trevor Hastie, will take place on nearby Procida Island from Thursday 24 September (lunchtime) to Friday 25 September (morning). For more information, please contact Simona Balbi (sb@unina.it) or Michael Greenacre (michael.greenacre@upf.edu).

The ECAS course on Statistical Analysis of Network Data will be organized September 28 - October 2 at Hirsching, Germany. For more information, go to www.statistik.lmu.de/ecas/index.html

The 10th Scientific Meeting of the Classification and Data Analysis Group (CLADAG 2015) will take place October 8-10 at the Flamingo Hotel in Santa Margherita di Pula, Cagliari, Italy. For more information, go to <http://convegni.unica.it/cladag2015/>

Route description

The 4th VOC Conference will take place at the Gymnasium building (USC Universitair Sportcentrum), Heyendaalseweg 141, 6525 AJ Nijmegen.



By car

Information can be found at <http://www.ru.nl/english/about-us/organisation/contact/how-get/vm/car/>.

Coming from Amsterdam/Utrecht on the A2, take the A15, direction Nijmegen. At intersection 'Knooppunt Ressen' follow the signs N325 Nijmegen/Kleve. Entering Nijmegen after crossing the Waalbrug, follow the signs Radboud UMC/University.

Coming from Rotterdam take the A15 direction Nijmegen. At the intersection 'Knooppunt Ressen' follow the signs N325 Nijmegen/Kleve. Entering Nijmegen after crossing the Waalbrug, follow the signs Radboud UMC/University.

From the south (Belgium), the Paris-Brussels-Antwerp-Breda motorway leads to Nijmegen (via Tilburg and 's-Hertogenbosch).

Radboud University Nijmegen and the University Medical Centre Radboudumc are signposted as 'Universiteit', 'H Ziekenhuizen' and 'Radboudumc' on all major routes into Nijmegen.

All car parks on the campus are equipped with boom barriers and pay-point terminals. Regular parking costs €2 per hour up to a maximum of €10 per day. You have to pay all working days between 7h and 18h. It is only possible to pay by pin pass or credit card (it is not possible to pay by cash) !

By public transport

The Gymnasion can be reached on foot (between 5 and 10 minutes walking) from the railway station 'Nijmegen Heyendaal'. It is also possible to take bus 10 (Heyendaal shuttle, 3th stop, 6 minutes) or bus 14 (direction Nijmegen Brakkenstein, 4th stop, about 5 minutes) from Nijmegen Central Station (both busses also stop at Nijmegen Heyendaal). There will be a bus at least every 10 minutes. The bus stop 'Nijmegen Erasmusgebouw' is very bear to the Gymnasion building.

Vereniging voor Ordinatie en Classificatie
Dutch/Flemish Classification Society



Radboud University



**The 4th Annual Conference of the
Dutch/Flemish Classification Society
(in collaboration with Analytical Chemistry-
Chemometrics Research Group, Radboud
University Nijmegen)**

Abstracts

May 29th 2015

Nijmegen

Program 4th VOC Conference (Nijmegen, May 29th, 2015)Submitted paper session 1 (11.00-12.10)

- Gerjen H. Tinnevelt** Single cell analysis with DAMACY: Discriminant analysis of multi-aspect cytometry
- Edoardo Saccenti* Probabilistic networks of blood metabolites in healthy subjects as indicators of latent cardiovascular risk
- Geert Postma* Pseudo sample trajectories for the detection of variable interaction in Dissimilarity Partial Least Squares models

Keynote address (13.10-14.10)

- Morten A. Rasmussen* **Notes on some ideas from the Netherlands - seen from a Danish perspective**

Submitted paper session 2 (14.25-15.55)

- Lisa Doove** A novel method for estimating optimal tree-based treatment regimes in randomized clinical trials
- Mattis van den Bergh** Divisive latent class analysis applied to social capital
- Alwin Stegeman* Direct-fitting common factor analysis
- Tom F. Wilderjans* CLV3W: Clustering of variables around latent components extended to conventional sensory profiling three-way data

Submitted paper session 3 (16.10-17.20)

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|------------------------------|--|
| <i>Dereje W. Gudicha*</i> | Power analysis for the likelihood-ratio test in latent Markov models: short-cutting the bootstrap p-value based method |
| <i>Roberto Di Mari*</i> | Three-step estimation approach in the context of latent Markov modeling with covariates |
| <i>Geert van Kollenburg*</i> | Resampling methods in Latent Class Analysis |

*candidate for young presenter award

Abstracts fourth VOC Conference (Nijmegen, May 29th, 2015)

Submitted paper session 1 (11.00-12.10)

- Gerjen H. Tinnevelt** Single cell analysis with DAMACY: Discriminant Analysis of Multi-Aspect Cytometry
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Gerjen H. Tinnevelt*

Radboud University, Analytical Chemistry

Single cell analysis with DAMACY: Discriminant Analysis of Multi-Aspect Cytometry

Multicolor flow cytometry is a powerful analytical tool to measure single cells (> 10,000 per second) based on multiple fluorescent markers. These fluorescent markers are surface proteins on the cells. Flow cytometry has applications in immunology, hematology, medical diagnosis and ecology. Flow cytometry can be used for the prediction of phenotypes and consists of four major levels. The surface protein expression, cell populations, individual and cohort level. Currently most methods only describe one or two levels.

The main goal is to describe the differences in surface markers expression within the cellular distributions between individuals from two different cohorts, e.g. healthy vs diseased in one single map.

Edoardo Saccenti

Wageningen University

Probabilistic networks of blood metabolites in healthy subjects as indicators of latent cardiovascular risk

The complex nature of the mechanisms behind cardiovascular diseases prevents the detection of latent early risk conditions. Network representations are ideally suited to investigate the complex interconnections between the individual components of a biological system that underlies complex diseases.

Here, we investigate the patterns of correlations of an array of 29 metabolites identified and quantified in the plasma of 864 healthy blood donors and use a systems biology approach to define metabolite probabilistic networks specific for low and high latent cardiovascular risk. To this task, we developed the PCLRC method, based on the likelihood of correlation and methods from information theory and combined them with resampling techniques and standard data analysis tools like INDSCAL.

Our results show that plasma metabolite networks can be defined that associate with latent cardiovascular disease risk. The analysis of the networks supports our previous finding of a possible association between cardiovascular risk and impaired mitochondrial activity and highlights posttranslational modifications (glycosilation and oxidation) of lipoproteins as a possible target-mechanism for early detection of latent cardiovascular risk.

References

Saccenti, E., et al. (2015). Probabilistic networks of blood metabolites in healthy subjects as indicators of latent cardiovascular risk. *Journal of Proteome Research*, 14(2), 1101–1111A.

Geert Postma

Radboud University, Analytical Chemistry

Pseudo sample trajectories for the detection of variable interaction in Dissimilarity Partial Least Squares models

Linear regression and classification models ignore variable interactions unless they are explicitly included in the model, which is a difficult task for high-dimensional data. Kernel based methods are capable of automatically including variable interaction in their model. However, these models are difficult to interpret. In order to retrieve and visualize the contribution of variables in kernel based methods, recently the visualization method based on pseudo sample trajectories was developed [1]. This method, however, is not capable of visualizing variable interactions. In this work we propose a simple extension of the pseudo sample trajectory methodology to visualize variable interactions [2]. An associated measure and a visualization method for testing the significance of variable interactions is introduced and tested as well. In this study, the methodology is applied to Dissimilarity Partial Least Squares [3], which is a kernel-based method that does not require kernel optimization. Both simulated and real data are used to demonstrate the properties of the new pseudo sample approach.

References

1. Postma, G.J., Krooshof, P.W.T., Buydens, L.M.C. *Anal. Chim. Acta*, 2011, 705, 123-134
2. Engel, J., Postma, G.J., Peufflik, I. van, Blanchet, L., Buydens, L.M.C. *Chemometr. Intell. Lab.*, accepted
3. Zerzucha, P., Daszykowski, M., Walczak, B. *Chemometr. Intell. Lab.* 2012, 110, 156-162

Keynote address (13.10-14.10)

Morten Arendt Rasmussen

Copenhagen University

Notes on some ideas from the Netherlands - seen from a Danish perspective

This talk is going to review some useful methods for the analysis of multivariate data structures by proposing a unified framework encapsulating Anova Simultaneous Component Analysis (ASCA), ANOVA-PCA and Linear Discriminant Analysis (LDA). ASCA is a versatile tool for analyzing multivariate data from designed experiments. Based on anova variance partitioning followed by bi-linear modelling of the individual effect matrices the method offers detailed insight into small systematic variance contributors that otherwise are masked. Interpreting an entire ASCA model based on a complex design can be demanding simply due to the high number of sub models. Undirected multiblock modelling offers a framework for simultaneous modelling of several data matrices and unraveling shared and distinct information. When utilized together with ASCA, interpretability can be simplified.

Submitted paper session 2 (14.25-15.55)

- Lisa Doove** A novel method for estimating optimal tree-based treatment regimes in randomized clinical trials
- Mattis van den Bergh** Divisive latent class analysis applied to social capital
- Alwin Stegeman* Direct-fitting common factor analysis
- Tom F. Wilderjans* CLV3W: Clustering of variables around latent components extended to conventional sensory profiling three-way data

Lisa Doove*

KU Leuven

A novel method for estimating optimal tree-based treatment regimes in randomized clinical trials

For many medical problems, multiple treatment alternatives are available. A major challenge in such cases pertains to identifying optimal treatment regimes that specify for each individual client the preferable treatment alternative, with the optimal regime being the one leading to the greatest expected potential outcome for the population under study. Estimating optimal regimes comes down to an unsupervised learning problem, with the goal being to find a set of unknown subgroups of patients each of which is associated with a preferable treatment alternative. Of particular interest for this problem are methods to construct tree-based treatment regimes, in which the subgroups that constitute the basis of the regimes are the leaves of a decision tree. However, the majority of methods for estimating tree-based treatment regimes either do not formally optimize an estimate of expected potential outcome, or use supervised learning techniques. In this paper we propose a novel unsupervised tree-based approach for estimating optimal treatment regimes in RCTs that directly maximizes an estimator of the overall expected outcome for the tree-based regimes under study. The performance of the proposed approach is assessed through simulation studies, and the approach is illustrated using data from an RCT on primary operable breast cancer.

Mattis van den Bergh*

Tilburg University

Divisive latent class analysis applied to social capital

Latent class analysis is used to identify substantively meaningful clusters. This talk introduces divisive latent class analysis to estimate a hierarchical structure of latent classes. This gives a clear insight in the link between retrieved classes and facilitates interpretation. Divisive latent class analysis is a recursive procedure starting with a single class. In each step a class is split in two classes, or not, depending on model selection criteria. The procedure stops when none of the classes needs to be split up anymore. The result is a hierarchical tree of classes. An example with data on social capital from Owen and Videras (2009) shows the practical use of the application.

Alwin Stegeman

Heymans Institute for Psychological Research

Direct-fitting common factor analysis

The common factor model is usually fitted to an observed covariance matrix. Conceptually, the data is split into a common covariance producing part and an uncorrelated unique part. We consider fitting the common factor model directly to the data itself, with explicit estimates of the common and unique parts. We discuss direct-fitting analogues of MINRES and Minimum Rank Factor Analysis (MRFA). Additionally, we give an algebraic analysis of factor indeterminacy under imperfect fit for both direct-fitting factor models. It will be shown that both models yield closed-form expressions for the determinate and indeterminate factor parts. Moreover, these can be used to obtain probability density estimates (or standard deviations) of the factor scores due to factor indeterminacy. The models and their algorithms are evaluated in a simulation study, and an application to a dataset in the literature is presented.

Tom F. Wilderjans

KU Leuven, Leiden University

***CLV3W*: Clustering of variables around latent components extended to conventional sensory profiling three-way data**

To detect panel disagreement, we propose the Clustering around Latent Variables for three-way data (*CLV3W*) approach which extends the Clustering of variables around latent components (*CLV*) approach (Vigneau & Qannari, 2003) to three-way data typically obtained from a conventional sensory profiling procedure (i.e., assessors rating products on various descriptors). The *CLV3W* method groups the descriptors into a small number of clusters and estimates for each cluster an associated latent sensory component such that the attributes within each cluster are as much related (i.e., highest squared covariance) as possible with the latent component. Simultaneously, for each latent sensory component separately, a system of weights is estimated that yields information regarding the extent to which an assessor (dis)agrees with the rest of the panel according to the latent sensory component under study. As such, our strategy gives a better insight into the performance of the panel than existing approaches based on *Statis* or Generalized Procrustes Analysis (*GPA*), which only assign a single weight to each assessor, whereas our method allows assessors to agree/disagree with the panel on some but not all latent dimensions. Our strategy turns out to be similar to performing a Clusterwise Parafac (Wilderjans & Ceulemans, 2013) with a single component. Our new approach is illustrated with a dataset pertaining to Quantitative Descriptive Analysis applied to cider varieties. It is shown that *CLV3W* is able to detect differential panel disagreement on various latent sensory components.

Submitted paper session 3 (16.10-17.20)

- Dereje W. Gudicha** Power analysis for the likelihood-ratio test in latent Markov models: short-cutting the bootstrap p-value based method
- Roberto Di Mari** Three-step estimation approach in the context of latent Markov modeling with covariates
- Geert van Kollenburg** Resampling methods in Latent Class Analysis

Dereje W. Gudicha*

Tilburg University

Power analysis for the likelihood-ratio test in latent Markov models: short-cutting the bootstrap p-value based method

The latent Markov (LM) model is a popular method for identifying distinct unobserved states and transitions between these states over time in longitudinally observed responses. The bootstrap likelihood-ratio (BLR) test yields the most rigorous test for determining the number of latent states, yet little is known about power analysis for this test. Power could be computed as the proportion of the bootstrap p-values (PBP) for which the null hypothesis is rejected. This requires performing the full bootstrap procedure for a large number of samples generated from the model under the alternative hypothesis, which is computationally infeasible in most situations. This chapter presents a computationally feasible short-cut method for power computation for the BLR test. The short-cut method involves the following simple steps: 1) obtaining the parameters of the model under the null hypothesis, 2) constructing the empirical distributions of the likelihood-ratio under the null and alternative hypotheses via Monte Carlo simulations, and 3) using these empirical distributions to compute the power. We evaluate the performance of the short-cut method by comparing it to the PBP method, and moreover show how the short-cut method can be used for sample size determination.

Roberto Di Mari*

Università di Roma Tor Vergata

Three-step estimation approach in the context of latent Markov modeling with covariates

The estimation of latent Markov (LM) models with covariates is commonly carried out via Maximum Likelihood (Baum et al., 1970; Dempster et al., 1977; Welch, 2003). One-step Maximum Likelihood estimation in the context of LM models has two main drawbacks. First, the inclusion of covariates might alter the choice of the number of classes. Second, the estimation routine becomes unfeasible when the algorithm deals with many responses, a large number of covariates and time points. In fact, this can be the case in several practical situations. In addition, researchers might be interested in building a classification model at a first stage of the analysis.

The present paper wants to address the question of whether, in a LM model context, it is possible to formulate an alternative to one-step estimation, which might work well and facilitate the use of many responses and covariates. The proposed answer is a three-step estimation procedure where in a first step, a standard latent class (LC) model is fitted to the data. In a second step, posterior class memberships are obtained from the model fitted in the previous step and class assignments are retrieved accordingly. In the third step, classification is taken as response variable and used to build up a simple LM model with covariates, where the relationship of interest is analyzed through a logistic regression of the initial state and transitions on the explanatory variables.

Our three-step approach is powerful as it solves the following problems. We propose a first step where dependent observations are pooled for the estimation of the measurement model. A modified first step is also proposed, where the time structure is accounted for, and the two alternatives are evaluated in the simulation study. Second, the bias in the estimated covariate effects in the third step caused by the classification error in the second step is corrected. In particular we extend the approach of Vermunt (2010), formulated in the context of three-step LC estimation, to three-step LM estimation. Third, the problem of correct

inference of the estimates in the third step is tackled and a method for correct SEs estimation is provided.

A simulation study was carried out in order to test the performance of the proposed correction methods under a variety of conditions. These are compared to the standard one-step method. The results show that both correction methods yield parameter estimates and SEs which can be trusted, with the exception of cases with poorly separated classes and low sample size.

Geert van Kollenburg*

Tilburg University

resampling methods in Latent Class Analysis

The assessment of model fit is an important part of statistical analysis. The researchers' interest may lie with specific aspects of a model, or in the global fit. Asymptotic p-values are not available for every conceivable statistic and even when they are available they may not be valid when sample sizes are not very large. To get more reliable p-values, researchers may resort to resampling methods. Some of these methods are time consuming, while others may provide p-values which are not uniform under the null-hypothesis. This talk will illustrate the most common (resampling) methods to test model fit, illustrated in the context of Latent Class Analysis. The presentation will discuss a recently proposed calibration the posterior predictive p-value. Finally a very fast resampling scheme is proposed where the statistics are based on data only, which requires each model of interest to be estimated only once.