

# Angelos Markos

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Professor (Assistant with tenure), Dept. of Primary Education, Democritus University of Thrace  
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## Career – Academic Appointments

*Professor (Assistant)*, Dept. of Primary Educ., Democritus Univ. of Thrace (tenured position from Aug 2018) Aug 2014 - present

*Tutor*, Hellenic Open University Oct 2017 - July 2018

*Visiting Scholar*, Statistics Department, Stanford University, California, USA Jan 2017 - April 2017

*Adjunct Lecturer*, School of Political Sci, Aristotle Univ. of Thessaloniki Mar 2016 - Aug 2016

*Lecturer*, Dept. of Primary Education, Democritus Univ. of Thrace Jan 2011 - Aug 2014

*Adjunct Lecturer*, Dept. of Primary Education, Democritus Univ. of Thrace 2009 - 2010

*Adjunct Lecturer*, Dept. of Applied Informatics, Univ. of Macedonia 2009 - 2010

*Research Associate*, Dept. of Accounting, Tech. Educational Institute of Thessaloniki 2007 - 2008

*Lab Assistant*, Dept. of Marketing, Tech. Educational Institute of Thessaloniki 2003 - 2007

## Education

*University of Macedonia, Thessaloniki, Greece*: Ph.D. in Applied Informatics Sept 2002 - Dec 2006  
Area: Geometric Data Analysis (Analyse des Données), Supervisor: Iannis Papadimitriou

*University of Macedonia, Thessaloniki, Greece*: B.A. in Applied Informatics Sept 1998 - June 2002

## Areas of interest

multivariate analysis; exploratory data analysis (dimension reduction and clustering); psychological measurement and testing; educational research.

## Current research projects

Joint dimension reduction and clustering (with A. Iodice D'Enza, M. van de Velden, F. Palumbo)

Adaptive LEARNING in Statistics - ALEaS (Erasmus+ KA2 project)

Incremental decomposition methods (with A. Iodice D'Enza)

Standardization and adaptation of the Greek version of Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V) (with A. Stogiannidou et al.)

## Publications

*Data Analysis (methodological: dimensionality reduction and clustering)*

Markos, A., Iodice D'Enza, A., & van de Velden, M. (2019). Beyond Tandem Analysis: Joint Dimension Reduction and Clustering in R. *Journal of Statistical Software* (accepted for publication)

van de Velden, M., Iodice D'Enza, A., & Markos, A. (2018). Distance-based clustering of mixed data. *WIREs Computational Statistics* (accepted for publication)

Markos, A., Moschidis, O., & Chadjipantelis, T. (2018). Sequential Dimension Reduction and Clustering of Mixed-Type Datasets. *International Journal of Data Analysis Techniques and Strategies* (accepted for publication)

Iodice D'Enza, A., Markos, A., & Buttarazzi, D. (2018). idm: Incremental Decomposition Methods in R. *Journal of Statistical Software, Code Snippets*, 86(4), 1–24.

Markos, A. (2017). A Fuzzy Coding Approach to Data Processing Using the Bar. *Ratio Mathematica*, 33, 127–138.

Markos, A., & Iodice D'Enza, A. (2017). A Framework for the Incremental Update of the MCA Solution. *Italian Journal of Applied Statistics, Special Issue on Correspondence Analysis and Related Methods*. Eds: S. Balbi, J. Blasius, & M. Greenacre, 29(2-3), 217–231.

Dramalidis, A., & Markos, A. (2016). Subset Multiple Correspondence Analysis as a Tool for Visualizing Affiliation Networks. *Journal of Data Analysis and Information Processing*, 4, 81–89.

Markos, A., & Iodice D'Enza, A. (2016). Incremental Generalized Canonical Correlation Analysis. In A. Wilhelm, A. Kestler (eds), *Analysis of Large and Complex Data, Studies in Classification, Data Analysis, and Knowledge Organization*, pp. 185–194, Springer. [Theory Award by the German Classification Society-GfKI]

Iodice D'Enza, A., & Markos, A. (2015). Low-dimensional tracking of association structures in categorical data. *Statistics and Computing*, 25(5), 1009–1022.

Iodice D'Enza, A., & Markos, A. (2015). Incremental Visualization of Categorical Data. In I. Morlini, T. Minerva, M. Vichi (eds), *Advances in Statistical Models for Data Analysis, Studies in Classification, Data Analysis, and Knowledge Organization*, pp. 137–148, Springer.

Vozalis, M., Markos, A., & Margaritis, K. (2012). An Optimal Scaling Framework for Collaborative Filtering Recommendation Systems. *International Journal on Artificial Intelligence Tools*, 21(6), 1–26.

Markos, A., Menexes, G., & Papadimitriou, I. (2010). The CHIC Analysis Software v1.0. In H. Loracek-Junge & C. Weihs (eds), *Classification as a Tool for Research, Proceedings of the 11th IFCS Conference*. Springer Berlin, pp. 409–416. Menexes, G., Markos, A. & Papadimitriou, I. (2010). A method for adjusting the principal inertias of the Burt matrix in Multiple Correspondence Analysis. *Data Analysis Bulletin*, 11, 156–173. [In Greek]

Markos, A., Menexes, G., & Papadimitriou Th. (2009). Multiple Correspondence Analysis for “Tall” Data Sets. *Intelligent Data Analysis*, 13(6), 873–885.

Markos, A., Menexes, G. & Papadimitriou, I. (2007). Software for Power Analysis in the context of Correspondence Analysis. *Data Analysis Bulletin*, 8, 9–22. [In Greek]

- Menexes, G., Markos, A. & Papadimitriou, I. (2005). Confidence ellipses on Correspondence Analysis maps: Two approaches of their construction. *Data Analysis Bulletin*, 6, 26–46. [In Greek]
- Markos, A., Menexes, G., & Papadimitriou, I. (2005). An algorithm for selecting the block of the Burt matrix resulting in the most similar representation to the one obtained by a Correspondence Analysis of the full Burt matrix. *Proceedings, 18th PanHellenic Statistics Conference*, (pp. 247 – 256). Greek Statistical Institute. [In Greek]
- Menexes, G., Markos, A., & Papadimitriou, I. (2005). Constructing confidence ellipses on Correspondence Analysis maps. *Proceedings, 18th PanHellenic Statistics Conference*, (pp. 257–265). Greek Statistical Institute. [In Greek]
- Papadimitriou, I., & Markos, A. (2003). On the percentage of explained inertia in Correspondence Analysis. *Proceedings, 16th PanHellenic Statistics Conference*, (pp. 417 – 426), Greek Statistical Institute. [In Greek]
- Papadimitriou, I., & Markos, A. (2003). Citizens' attitudes towards EXPO 2008 in Thessaloniki. *Data Analysis Bulletin*, 4, 163–170. [In Greek]

#### *Data Analysis (applications)*

- Bibou, I., Markos, A., Ververidou, S., Chatzilampou, P., & Padeliaou, S. (2019). Multi-informant evaluation of students' psychosocial status through SDQ in a national Greek sample. *Children and Youth Services Review*, 96, 47–54.
- Saprikis, V., & Markos, A. (2018). Modeling Users' Acceptance of Social Commerce. *International Journal of E-Business Research*, 14(4), 28–50.
- Angeloudi, A., Papageorgiou, G., & Markos, A. (2018). Primary students' argumentation on factors affecting dissolving. *Science Education International*, 29(3), 127–136.
- Saprikis, V., Markos, A., Zarpmpou, T., & Vlachopoulou, M. (2018). Mobile shopping consumers' behavior: An Exploratory Study and Review. *Journal of Theoretical and Applied Electronic Commerce Research*, 13(1), 71–90.
- Kevrekidis, D.-P., Minarikova, D., Markos, A., Malovecka, I., & Minarik, P. (2017). Community pharmacy customer segmentation based on factors influencing their selection of pharmacy and over-the-counter medicines. *Saudi Pharmaceutical Journal*, 26(1), 33–43.
- Bibou, I., & Markos, A. (2017). Greek teachers' experience and perceptions of child abuse/neglect. *Advances in School Mental Health Promotion*, 4, 265–282.
- Markos, A., & Kokkinos, C.M. (2017). Development of a Short Form of the Greek Big Five Questionnaire for Children (GBFQ-C-SF): Validation among Preadolescents. *Personality and Individual Differences*, 112, 12–17.
- Markos, A., Boubonari, T., Mogias, A. & Kevrekidis, T. (2017). Measuring Ocean Literacy in Pre-service Teachers: Psychometric Properties of the Greek Version of the Survey of Ocean Literacy and Engagement (SOLE). *Environmental Education Research*, 23(2), 231–251.
- Kokkinos, C.M., & Markos, A. (2017). The Big Five Questionnaire for Children (BFQ-C): Factorial Invariance across Sex and Age in a Greek Sample of Pre-adolescents. *European Journal of Psychological Assessment*, 33(2), 129–133.

- Alexiadis, G., Panagoutsos, S., Roumeliotis, S., Stibiris, I., Markos, A., Kantartzi, K., & Pas-sadakakis, P. (2017). Comparison of multiple fluid status assessment methods in patients on chronic hemodialysis, *International Urology and Nephrology*, 49(3), 525–532.
- Papageorgiou, G., Markos, A., & Zarkadis, N. (2017). Understanding the atom and relevant misconceptions. Students' profiles in relation to three cognitive variables. *Science Education International*, 27(4), 464–488.
- Menexes G., Markos, A., Korpetis, E., Koutsos, T., & Mavromatis, A. (2017). Ranking of Genotypes based on multiple relative criteria: a methodological proposal, *Proceedings, 12th Panhellenic Conference of the Hellenic Scientific Society for Genetics and Plant Breeding* (in press). [In Greek]
- Stamovlasis, D., Markos, A., & Papageorgiou, G. (2017). A comparative contribution of dissimilarity-based clustering and latent class analysis in science education research: The case of children's mental model of the Earth, *Proceedings, 9th PanHellenic Conference on Science Education & ICT Education*, (pp. 160–166). [In Greek]
- Kokkinos, C.M., Kirpitsi, E., & Markos, A. (2016). Preadolescents' Psychosocial Functioning: The Role of Personality and Attachment Style, *Mental Health & Prevention*, 4(3), 105–114.
- Antoniadou, N., Kokkinos, C.M., & Markos, A. (2016). Development, Construct Validation and Measurement Invariance of the Greek Cyber-Bullying/Victimization Experiences Questionnaire (CBVEQ-G). *Computers in Human Behavior*, 65C, 380–390.
- Kokkinos, C.M., Voulgaridou, I., & Markos, A. (2016). Personality and Relational Aggression: Moral Disengagement and Friendship Quality as Mediators, *Personality and Individual Differences*, 95, 74–79.
- Antoniadou, N., Kokkinos, C.M., & Markos, A. (2016). Possible Common Correlates between Bullying and Cyber-Bullying among Adolescents, *Psicologia Educativa*, 22, 27–38.
- Papageorgiou, G., Markos, A., & Zarkadis, N. (2016). Students' representations of the atomic structure – The effect of some individual differences in particular task contexts. *Chemistry Education Research and Practice*, 17, 209–219.
- Dramalidis, A., & Markos, A. (2016). Assessing mathematical proficiency needed for primary education students an introductory statistics course to successfully complete. *Data Analysis Bulletin*, 17, 14–25. [In Greek]
- Dramalidis, A., Markos, A., & Sakonidis, H. (2016). Mathematics achievement of Muslim Minority children in Thrace aged 11-16 years. *Data Analysis Bulletin*, 17, 65–83 [In Greek].
- Kokkinos, C., Voulgaridou, I., Koukoutsis, N., & Markos, A. (2015). Peer Victimization and Depression in Greek Preadolescents: Personality and Attachment as Moderators. *Personal Relationships*, 23(2), 280–295.
- Kokkinos, C.M., Kargiotidis, A., & Markos, A. (2015). The Relationship between Learning and Study Strategies and Big Five Personality Traits among Junior University Student Teachers. *Learning and Individual Differences*, 43, 39–47.
- Efthymiou, A., Fragaki, G. & Markos, A. (2015). Exploring the polysemy of the Modern Greek prefix iper-. *Morphology*, 25(4), 411–438.
- Efthymiou, A., Fragaki, G., & Markos, A. (2015). Exploring the meaning and productivity of a polysemous prefix: The case of the Modern Greek prepositional prefix para-. *Acta Linguistica*

*Hungarica*, 62(4), 447–476.

Mogias, A., Boubonari, T., Markos, A., & Kevrekidis T. (2015). Greek pre-service teachers' knowledge of ocean sciences issues and attitudes towards ocean stewardship. *The Journal of Environmental Education*, 46(4), 251–270.

Kambaki-Vougioukli, P., & Markos, A. (2015). Greek philology students' self-reported knowledge of dialects/idioms with the use of the response bar. In G. Kotzoglou, K. Nikolou, E. Karatzola, K. Frantzi, I. Galantomos, M. Georgalidou, V. Kourti-Kazoullis, Ch. Papadopoulou, E. Vlachou (eds), *Selected Papers of the 11th International Conference of Greek Linguistics*. Rhodes: University of the Aegean, 645-657. [In Greek]

Efthymiou, A., Fragaki, G. & Markos, A. (2015). Aspects of productivity of the Modern Greek prefix iper-: A corpus-based study. In G. Kotzoglou, K. Nikolou, E. Karatzola, K. Frantzi, I. Galantomos, M. Georgalidou, V. Kourti-Kazoullis, Ch. Papadopoulou, E. Vlachou (eds), *Selected Papers of the 11th International Conference of Greek Linguistics*. Rhodes: University of the Aegean, 373–383.

Zarkadis, N., Papageorgiou, G., & Markos, A. (2015). Representations of the atomic structure – The effect of individual differences on secondary school students' understanding, *Proceedings, 9th PanHellenic Conference on Science Education & ICT Education*, (pp. 559–564). [In Greek]

Antoniadou, N., Kokkinos, C.M., & Markos, A. (2014). Cyber-bullying: An investigation of the psychological profile of University student participants. *Journal of Applied Developmental Psychology*, 35(3), 204–214. (featured at OpenForest.net <https://goo.gl/C6aMv3>)

Dramalidis, A., & Markos, A. (2014). An investigation of factors associated with performance in placement exams of a Primary Education Department. *Data Analysis Bulletin*, 16, 104–113. [In Greek]

Brouskeli, V., & Markos, A. (2013). The Role of Locus of Control and Perceived Stress in Dealing with Unemployment during Economic Crisis. *Research on Humanities and Social Sciences*, 21(3), 95–102.

Boubonari, T., Markos, A., & Kevrekidis, T. (2013). Greek pre-service teachers knowledge, attitudes and environmental behavior towards marine pollution. *The Journal of Environmental Education*, 44(4), 232–251.

Theodosiadou, S., & Markos, A. (2013). Attitudes of preschool teachers in Northern Greece on children and TV viewing. *Australasian Journal of Early Childhood*, 38(3), 36–44.

Ter Mors, E., Terwel, B.W., Daamen, D.D.L. et al., (& Markos, A.) (2013). A Comparison of Techniques Used to Collect Informed Public Opinions about CCS: Opinion Quality After Focus Group Discussions Versus Information-Choice Questionnaires. *International Journal of Greenhouse Gas Control*, 18, 256–263.

Bibou-Nakou, I., & Markos, A. (2013). Coping strategies of secondary school children experiencing bullying: frequency and type of bullying. School Bullying: Predictive Factors. In K. Dekker, M. Dijkstra (eds), *Coping Strategies and Effects on Mental Health*, pp. 69–96, Nova Publishers. Efthymiou, A., Fragaki, G., & Markos, A. (2012). Productivity of verb forming suffixes in Modern Greek: A corpus-based study. *Morphology*, 22(4), 515–543.

Sakka, D., & Markos, A. (2013). From the adolescents' perspective: Aggression and violence at school in relation to ethnicity and gender. In V. Deligianni-Kouimtzi, E. Gonida, E. Figgou,

- A. Baka & D. Moraitou (Eds) *Scientific Annals of the School of Psychology, Aristotle University of Thessaloniki*, Vol. I. (127 – 162) [In Greek]
- Markos, A., Dramalidis, A. & Menexes, G. (2013). Student response patterns and scale usage heterogeneity in PISA 2006 Science Interest scale. *Data Analysis Bulletin*, 13, 114–126.
- Zarkadis, N., Papageorgiou, G., & Markos, A. (2013). Representations of the atomic structure – A cross-age study in secondary school students. *Proceedings, 8th PanHellenic Conference on Science Education & ICT Education*, (pp. 370–377). [In Greek]
- Zarpmpou, T., Saprikis, V., Markos, A., & Vlachopoulou, M. (2012). Modeling Users' Acceptance of Mobile Services. *Electronic Commerce Research*, 12(2), 225–248.
- Triantafillidou, K., Venetis, G., & Markos, A. (2012). Short term results of autologous blood injection for treatment of habitual TMJ luxation. *Journal of Craniofacial Surgery*, 23(3), 689–692.
- Efthymiou, A., Fragaki, G. & Markos, A. (2012). Exploring the productivity of –pio in Modern Greek: A corpus-based study. In Z. Gavriilidou, A. Efthymiou, E. Thomadaki, P. Kambakis-Vougiouklis (eds), *Selected papers of the 10th International Conference of Greek Linguistics*. Komotini: Democritus University of Thrace, 243–254.
- Dramalidis, A., Markos, A., Sakonidis, H., Papageorgiou, G., & Fachiridis, G. (2012). Social and educational characteristics of perspective primary teachers: tracing changes during the last two decades. *Data Analysis Bulletin*, 13, 175–190. [In Greek]
- Menexes, G., Markos, A., & Farmakis, N. (2012). Index for measuring the convergence between groups of data and a target (reference) data table: application to energy inputs-outputs tabled data of selected agro-ecosystems. *Data Analysis Bulletin*, 13, 28–44. [In Greek]
- Menexes, G., Bladenopoulos, K., & Markos, A. (2012). A method for ranking a large number of cereal lines. *Data Analysis Bulletin*, 13, 86–98. [In Greek]
- Pietzner, K., Schumann, D., Tvedt, S., Torvatn, H., Næss, R., Reiner, D., Anghel, S., Cismaru, D., Constantin, C., Daamen, D., Dudu, A., Esken, A., Gemeni, V., Ivan, L., Koukouzas, N., Kristiansen, G., Markos, A., et al. (2011). Public awareness and perceptions of carbon dioxide capture and storage (CCS): Insights from surveys administered to representative samples in six European countries. *Energy Procedia*, 4, 6300–6306.
- Daamen, D., Terwel, B., Ter Mors, E., Reiner, D., Schumann, D., Anghel, S., Boulouta, I., Cismaru, D., Constanstin, C., De Jager, C., Dudu, A., Firth, R., Gemeni, V., Hendriks, C., Koukouzas, N., Markos, A., et al. (2011). Scrutinizing the impact of CCS communication on opinion quality: Focus Group Discussions versus Information-Choice Questionnaires: Results from experimental research in six countries. *Energy Procedia*, 4, 6182–6187.
- Vozalis, M.G., Markos A., & Margaritis K.G. (2010). Collaborative Filtering through SVD-Based and Hierarchical Nonlinear PCA. In K. Diamantaras, W. Duch, L.S. Iliadis (eds), *ICANN 2010, Part I, LNCS 6352*, pp. 395–400.
- Markos, A., Vozalis, M., & Margaritis, K.G. (2010). An Optimal Scaling Approach to Collaborative Filtering using Categorical Principal Component Analysis and Neighborhood Formation. In H. Papadopoulos, A.S. Andreou, M. Bramer (eds), *AIAI 2010, IFIP AICT 339*, Springer Berlin / Heidelberg, pp. 22–29.

Kitsiou, S., Manthou, V., Vlachopoulou, M., & Markos, A. (2010). Adoption and sophistication of clinical information systems in Greek public hospitals: Results from a national web-based survey. In *XII Mediterranean Conference on Medical and Biological Engineering and Computing*, Springer Berlin / Heidelberg, pp. 1011–1016.

Vozalis, M., Markos, A., & Margaritis, K.G. (2009). On the Performance of SVD-based Algorithms for Collaborative Filtering. In *Proc. of the 4th Balkan Conference in Informatics*, IEEE Press, ISBN: 978-0-7695-3783-2, pp. 245–250. Patsioura, F., Kitsiou, S., & Markos, A. (2009). Evaluation of Greek Public Hospital Websites. In J. Filipe, D. A. Marca, B. Shishkov, and M. van Sinderen (eds), In *Proc. of the International Conference on e-Business (ICE-B 2009)*, INSTICC Press, pp. 223–229.

Vozalis, M.G., Markos, A.I., & Margaritis, K.G. (2009). A Hybrid Approach for Improving Prediction Coverage of Collaborative Filtering. In L. Iliadis, I. Vlahavas, M. Bramer (eds), *AIAI 2009, IFIP Vol. 296*, Springer Boston, pp. 491–498.

Vozalis, M., Markos, A., & Margaritis, K.G. (2009). Evaluation of standard SVD-based techniques for Collaborative Filtering. In *Proc. 9th Hellenic European Research on Computer Mathematics and its Applications Conference, HERCMA09*.

Dramalidis, A., Markos, A., & Sakonidis, H. (2009). Mathematics performance of secondary school students: An investigation of socio-educational factors. *Proceedings, 20th PanHellenic Statistics Conference*, (pp. 75 – 82). Greek Statistical Institute. [In Greek]

Markos, A., Menexes, G. & Papadimitriou, I. (2008). The CHIC Analysis v1.0. software. *Data Analysis Bulletin*, 9, 19–30. [In Greek]

Papadimitriou, I., & Markos, A., & Fragkaki, M. (2005). The Greek trade with the EU from 1990 to 2003, with emphasis on Fruits – Vegetables and Oil - Fats. *Proceedings, Scientific Congress “New Technologies & Marketing”*, (pp. 76–82). [In Greek]

#### *PhD Thesis*

Markos, A. (2006). *Interpretation of Correspondence Analysis: algorithms, indices and data input* Doctoral Thesis, University of Macedonia, Thessaloniki, Greece.

#### *Course Notes*

Markos, A. (2016). *Quantitative Methods in the Social Sciences* (179 pages) [In Greek]

Markos, A. (2012). *Assessing reliability and validity of psychometric scales with IBM SPSS Statistics* (12 pages). [In Greek]

Markos, A. (2012). *Reliability and validity of psychometric scales* (41 pages). [In Greek]

#### *Software*

Author, co-author and/or maintainer of the following software packages or scripts:

*clustrd* (with A. Iodice D’Enza & M. van de Velden). Methods for Joint Dimension Reduction and Clustering. Software presented in the 9th Scientific Meeting of the Classification and Data Analysis Group of the Italian Statistical Society, September 2013, Modena, Italy. URL: <http://cran.r-project.org/web/packages/clustrd/clustrd.pdf>

*caGUI* A Graphical User Interface (GUI) for the R package *ca* of Nenadic & Greenacre (2007).

*idm* (with A. Iodice D'Enza & D. Buttarazzi). Incremental Decomposition Methods in R (incremental versions of Principal Component Analysis and Multiple Correspondence Analysis). URL: <http://cran.r-project.org/web/packages/idm/idm.pdf>

*CFA in lavaan with examples* A collection of R scripts implementing the examples used in T. Brown's (2006) book: *Confirmatory Factor Analysis for Applied Research*. URL: <http://www.amarkos.gr/research/lavaan>

*CHIC Analysis* (Correspondence and Hierarchical Cluster Analysis Software). Correspondence Analysis and Hierarchical Clustering Software (Delphi and Matlab). It implements a series of proposals aiming to help the interpretation of Simple and Multiple Correspondence Analysis. URL: <http://www.amarkos.gr/research/chic>

*Procrustes* Software in Delphi & Matlab for Procrustes Analysis.

*Power Analysis for AFC* Power Analysis in the context of Correspondence Analysis (Excel Add-on).

#### *Conferences, Workshops, Seminars*

Selected presentations:

Markos, A., Moschidis, O., Menexes, G., & Chatzipantelis, T. (2018). On the performance of distance-based approaches for clustering mixed-type data. 23rd International Conference on Computational Statistics (COMPSTAT 2018), August 28–31, 2018, Iasi, Romania.

Palumbo, F., Iodice D'Enza, A., & Markos, A. (2018). Missing data imputation problems may occur when dealing with categorical data. 23rd International Conference on Computational Statistics (COMPSTAT 2018), August 28–31, 2018, Iasi, Romania.

van de Velden, M., Iodice D'Enza, A., & Markos, A. (2018). Joint dimension reduction and cluster analysis of mixed data, IMPS 2018, July 10–13, 2018, New York, USA.

van de Velden, M., Iodice D'Enza, A., & Markos, A. (2018). Issues in joint dimension reduction and clustering methods. 49th Scientific meeting of the Italian Statistical Society, June 20–22, 2018, Palermo, Italy.

Palumbo, F., Iodice D'Enza, A., & Markos, A. (2017). Discriminant analysis with categorical predictors: A NSCA-based approach. IFCS 2017 Conference, August 7–10, Tokyo, Japan.

Iodice D'Enza, van de Velden, M. & Markos, A. (2016). Clustering of high dimensional categorical data via dimension reduction. 9th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2016), December 9–11, 2016, Seville, Spain.

Markos, A. & Iodice D'Enza, A. (2016). A comparison of incremental Multiple Correspondence Analysis approaches for high-dimensional data. International Conference on Information Complexity and Statistical Modeling in High Dimensions with Applications (IC-SMHD-2016), May 18–21, 2016, Cappadocia, Turkey.

Markos, A., & Iodice D'Enza, A. (2015). Joint dimension reduction and fuzzy clustering. The 7th CARME (Correspondence Analysis and Related Methods) Conference, September 20–23, 2015, Naples, Italy.



Iodice D'Enza, A., & Markos, A. (2015). [Invited Speaker]. SVD computation and updating for large data sets. Workshop on Singular Value Decomposition (SVD) after CARME 2015 conference, September 24–25, 2015, Procida Italy.

Iodice D'Enza, A., Markos, A., & Palumbo, F. (2015). Iterative Factor Clustering for Categorical Data Reconsidered. CLADAG 2015. 10th Scientific Meeting of the Classification and Data Analysis Group of the Italian Statistical Society, October 8–10, 2015, Cagliari, Italy.

Markos, A. & Iodice D'Enza, A. (2014). Incremental Generalized Canonical Correlation Analysis. 2nd European Conference on Data Analysis (ECDA 2014), July 2 – 4, 2014, Bremen, Germany.

Markos, A., Iodice D'Enza, A., & van de Velden, M. (2013). Beyond tandem analysis: joint dimension reduction and clustering in R. 9th Scientific Meeting of the Classification and Data Analysis Group of the Italian Statistical Society, September 18–20, 2013, Modena, Italy.

Iodice D'Enza, A., & Markos, A. (2013). Low dimensional tracking of association structures in categorical data. 9th Scientific Meeting of the Classification and Data Analysis Group of the Italian Statistical Society, September 18–20, 2013, Modena, Italy.

Iodice D'Enza, A., & Markos, A. (2013). Tracking Association Structures in Categorical Data Flows. IFCS 2013 Conference, July 13–17, Tilburg, The Netherlands.

Iodice D'Enza, A., & Markos, A. (2012). On the Visual Exploration of Large Categorical Data Sets and Data Flows. 8th International Symposium of Statistics, October 11–13, 2012, Eskisehir, Turkey.

Markos, A., & Menexes, G. (2011). Hierarchical Clustering on Special Manifolds. The 6th CARME (Correspondence Analysis and Related Methods) Conference, February 8–11, 2011, Rennes, France.

Markos, A. (2011). Student response patterns and scale usage heterogeneity in PISA 2006 science interest scales. 1st International Workshop on Correspondence Analysis and Related Methods (CARME), October 2011, Assos, Turkey.

Menexes, G., Bladenopoulos, K. & Markos, A. (2011). Ranking and clustering large number of cereal selection lines from experiments without randomization and replications of the lines. 33rd Annual Symposium of the German Association for Pattern Recognition (DAGM'11), August 30 - September 2, 2011, Frankfurt, Germany.

Markos, A.I., Vozalis, M. G. & Margaritis, K. G. (2010). An Optimal Scaling Approach to Collaborative Filtering using Categorical Principal Component Analysis and Neighborhood Formation. 6th IFIP Conference on Artificial Intelligence, Applications & Innovations (AIAI 2010), 6–7 October, 2010, Larnaca, Cyprus.

Vozalis, M.G., Markos, A. & Margaritis, K. G. (2010). Collaborative Filtering through SVD-based and Hierarchical Nonlinear Principal Component Analysis. 20th International Conference on Artificial Neural Networks (ICANN 2010), September 15–18, 2010, Thessaloniki, Greece.

Vozalis, M., Markos, A. & Margaritis, K. (2009). Evaluation of standard SVD-based techniques for Collaborative Filtering. 9th Hellenic European Research on Computer Mathematics and its Applications Conference (HERCMA 2009), September 24–26, 2009, Athens, Greece.

Vozalis, M., Markos, A. & Margaritis, K. (2009). On the Performance of SVD-based Algorithms for Collaborative Filtering. 4th Balkan Conference in Informatics (BCI '09), September 17–19, 2009, Thessaloniki, Greece.

Markos, A., Menexes, G., & Papadimitriou, I. (2009). The CHIC Analysis Software v1.0. 11th IFCS Conference, March 13–18, 2009, Dresden, Germany.

## **Scientific Distinction and Recognition of Scientific Work**

### *A) Journal Editorial Boards*

Data Analysis Bulletin (Tetradia Analysis Dedomenon), a journal published biennially by the Greek Society of Data Analysis.

### *B) Reviewer in Journals*

Statistics and Computing, Statistical Analysis and Data Mining, Soft Computing, Computational Statistics and Data Analysis, Journal of Statistical Software, Behaviormetrika, Econometrics and Statistics, Intelligent Data Analysis, International Journal on Artificial Intelligence Tools, Italian Journal of Applied Statistics, Electronic Commerce Research, Environmental Education Research, Data Analysis Bulletin

### *C) Invited Speaker*

Invited Lecture on *Categorical Data Clustering* as part of the course *Math 285 Cluster Analysis and Applications*, MS Statistics program, Department of Mathematics and Statistics, San Jose State University, March 6, 2017, San Jose California, USA (with Alfonso Iodice D'Enza).

Workshop on the Singular Value Decomposition (SVD), *SVD computation and updating for large data sets*, October 24-25, 2015, Procida, Italy (with Alfonso Iodice D'Enza).

Seminar in *Continuing Education in Research Methods and Data Analysis using ICT*, Department of Pre-School Education, June 19-21, 2009, University of Ioannina, Greece.

### *D) Awards*

*Theory Award* by the German Classification Society (GfKI) for our paper presented in the 2nd European Conference in Data Analysis:

Markos, A., & Iodice D'Enza, A. (2016). Incremental Generalized Canonical Correlation Analysis. In A. Wilhelm, A. Kestler (eds), *Analysis of Large and Complex Data, Studies in Classification, Data Analysis, and Knowledge Organization*, pp. 185–194, Springer.

## **Funded Research Projects**

### *Principal Investigator or Research Collaborator*

01.09.2018 – 31.03.2021 (expected): Principal Investigator of the applicant Democritus University of Thrace. *ALeaS: Adaptive Learning in Statistics* Erasmus+ Key Action 2: Cooperation for innovation and the exchange of good practices.

11.10.2017 – 30.06.2018: Survey design and data analysis, *Connected Cars, Connected Audience, News Ecosystem*. Funded by Google Digital News Initiative Innovation Fund. Project coordinator: Assistant Prof. Nikos Panagiotou, Aristotle University of Thessaloniki.

2015 – 2017: Data analyst/psychometrician, *Adaptation and standardization of the Weschler Intelligence Scale – V in the Greek population*. Project Coordinator: Prof. A. Stogiannidou, Aristotle University of Thessaloniki.

2011 – 2016: Data analyst, Practicum in the Dept. of Primary Education, University of Thrace (MIS 299940) *Evaluation report of students' practicum in the Department of Primary Education: Results of data analysis of student questionnaires*. Coordinating Institution: Democritus University of Thrace.

01.09.2013 – 31.12.2013: Data analyst, Program for Immigration and Intercultural Education (MIS 300607): *Evaluation report – results of an intervention program*. Coordinating Institution: University of Thessaly.

09.05.2011 – 31.12.2012: Instructor, *Training in-service teachers for the integration and use of ICT in education*. Coordinating Institution: Technological Educational Institute of Kavala.

01.04.2011 – 15.05.2011: Data analyst, *Nationwide survey on education regarding alcohol abuse*. University of Macedonia Research Institute.

01.02.2011 – 11.04.2011: Data analyst, *Patient satisfaction survey for the services of the Drug Prevention Centre in Thessaloniki*. University of Macedonia Research Institute.

30.04.2010 – 30.06.2010: Data analyst, *Job satisfaction survey among employees of Papageorgiou Hospital in Thessaloniki*. University of Macedonia Research Institute.

01.03.2010 – 30.04.2010: Data analyst, *Consumer confidence survey for the first semester of 2010*. University of Macedonia Research Institute.

14.09.2010 – 13.11.2010: Data analyst, *Consumer confidence survey for the first semester of 2010*. University of Macedonia Research Institute.

01.03.2009 - 31.03.2010: Data analyst, FENCO-ERA project *Scrutinizing the impact of CCS communication on the general and local public*. University of Macedonia Research Institute. Final report: <http://goo.gl/cPhrIS>

13.10.2008 – 31.12.2008: Research Project (No. 50105) *A proposal of indices for improving the measurement of socio-economic variables*. Department of Mathematics, Coordinating Institution: Aristotle University of Thessaloniki.

01.02.2008 – 31.12.2008: Data Analyst, Leonardo da Vinci Project: *IMPROHEALTH COLLABORATIVE Vocational Education and Training for Quality of Life Through eHealthcare & Well-Being No SK.03.B.F.PP -177014*. Coordinating Institution: University of Macedonia.

08.02.2007 – 07.02.2008: Data Analysis software developer, EPEAEK Project: *Revising the Curriculum of the Department of Applied Informatics*. Coordinating Institution: University of Macedonia.

01.01.2006 – 30.01.2006: Data Analyst, Pythagoras II Project: *Strengthening research teams at the University of Macedonia*. Coordinating Institution: University of Macedonia.

01.12.2004 – 31.08.2005: Data analysis software developer, EPEAEK II Project: *Revising the Curriculum of the Department of International Economic Relations and Development*. Coordinating Institution: Democritus University of Thrace.

29.01.2004 – 31.12.2004: Data analysis software developer, EPEAEK Project: *Revising the Curriculum of the Department of Applied Informatics*. Coordinating Institution: University of Macedonia.

2003: Researcher, *Development of educational material and multimedia applications*, Coordinating Institution: National Agricultural Research Foundation (N.A.R.F.).

## Teaching

A. Assistant Professor (2014 – Present)

### *Undergraduate courses*

Department of Primary Education, Democritus University of Thrace

*Qualitative and Quantitative Data Analysis* (fall semester, 2014 – 15, 2015 – 16, 2016 – 17, 2017 – 18)

*Introduction to Statistics* (spring semester, 2014 – 15, 2015 – 16, 2017 – 18)

*Multivariate Data Analysis* (spring semester, 2014 – 15, 2015 – 16, 2017 – 18)

*Mathematical Models* (spring semester, 2013 – 14, 2014 – 15)

*Modeling in Education* (spring semester, 2015 – 16, 2017 – 18)

*Linear Algebra* (spring semester, 2015 – 16)

Department of Political Sciences, Aristotle University of Thessaloniki

*Quantitative Methods in the Social Sciences* (spring semester, 2015 – 16)

### *Postgraduate courses*

*Educational Research in Practice* MS Program “Studies in Education”, Hellenic Open University (Oct 2017 – present)

*Quantitative and Qualitative Analysis of Educational Data* MS Program “Education Sciences: Mathematics and Science Education, Department of Primary Education, Democritus University of Thrace (spring semester, 2015 – 16)

*Quantitative and Qualitative Research Methods* MS Program “Education for the environment and sustainability”, Department of Education Sciences in Early Childhood, Democritus University of Thrace (spring semester, 2015 – 16, 2016 – 17, 2017 – 18)

*Research Methodology I* MS Program “Diversity and Theatre Pedagogy / Drama”, Department of Primary Education, Democritus University of Thrace (winter semester, 2016 – 17, 2017 – 18)

*Methodology in the Social and Human Sciences* MS Program “Educational Sciences: Cultural diversity and Education”, Department of Primary Education, Democritus University of Thrace (winter semester, 2016 – 17)

*Quantitative and Qualitative Data Analysis* MS Program “Educational Sciences: Cultural diversity and Education”, Department of Primary Education, Democritus University of Thrace (spring semester, 2016 – 17)

*Statistics & Data Analysis* MBA program, Department of Economics, Democritus University of Thrace, (winter semester, 2013 – 14, 2014 – 15, 2015 – 16, 2016 – 17, 2017 – 18).

*B. Lecturer (2011 – 2014)*

*Undergraduate courses*

*Introduction to Statistics* (spring semester, 2010 – 11, 2011 – 12, 2012 – 13, 2013 – 14)

*Multivariate Data Analysis* (spring semester, 2010 – 11, 2011 – 12, 2012 – 13, 2013 – 14)

*Calculus* (spring semester, 2010 – 11, 2011 – 12, 2012 – 13, 2013 – 14)

*Mathematical Models* (spring semester, 2010 – 11, 2011 – 12, 2012 – 13, 2013 – 14)

*Introduction to Statistics* (fall semester, In service training program for primary school teachers, In-service Training College “Theodoros Kastanos”, Dept of Primary Education, Democritus University of Thrace 2010 – 11)

*Modelling in Education* (spring semester, In service training program for primary school teachers, In-service Training College “Theodoros Kastanos”, Dept of Primary Education, Democritus University of Thrace 2010 – 11)

*Postgraduate courses*

*Educational Research: Methods for collecting and analyzing data.* MS Program “Innovative educational approaches in multicultural classroom environments”, Department of Education Sciences in Early Childhood (spring semester, 2013 – 14)

*C. Lecturer (part-time) / Research Associate / Lab Assistant (2003 – 2010)*

*Undergraduate courses*

*Qualitative and Quantitative Data Analysis* (fall semester, 2009 – 2010) Dept of Primary Education, Democritus University of Thrace

*Statistics I* (fall semester, 2009 – 10) Dept of Applied Informatics, University of Macedonia

*Data Analysis* (spring semester, 2009 – 10) Dept of Applied Informatics, University of Macedonia

*Business Statistics* (spring semester, 2007 – 08) Dept of Accounting, Technological Educational Institute of Thessaloniki

*Data Analysis* (2003 – 04, 2004 – 05, 2005 – 06 and 2006 – 07) Dept. of Marketing, Technological Educational Institute of Thessaloniki

*D. PhD Student (2002 – 2007)*

*Undergraduate courses*

*Statistics I* (fall semester, 2002 – 03, 2003 – 04, 2004 – 05)

*Data Analysis* (spring semester, 2002 – 03, 2003 – 04, 2004 – 05)

## Further Academic Activities

### *Member of Scientific Societies*

2003 – present: Greek Society of Data Analysis (<http://www.gsda.gr>). Board member since 2009. Representative to the International Federation of Classification Societies - IFCS (<http://ifcs.boku.ac.at>) for the period 2011 – 2013.

2009 – present: CARME-N (Correspondence Analysis and Related Methods – Network, <http://www.carme-n.org/>).

2008 – present: Research Committee RC33 on Logic and Methodology (<http://www.rc33.org/>).

### *Conference Scientific Committees*

6th PanHellenic Conference of Data Analysis with International Participation (Thessaloniki, 8–11 September, 2011).

7th PanHellenic Conference of Data Analysis with International Participation (Kavala, 12–14 September, 2013).

IFCS-2013, Symposium of the International Federation of Classification Societies - IFCS (Tilburg, The Netherlands, 14–17 July, 2013).

8th PanHellenic Conference of Data Analysis with International Participation (Alexandroupoli, 10–12 September, 2015).

1st International Conference “Art and Education” (Alexandroupoli, 22-25 June, 2017)

9th PanHellenic Conference of Data Analysis with International Participation (Thessaloniki, 28-30 September, 2017).

IFCS-2019, Symposium of the International Federation of Classification Societies (IFCS), Thessaloniki, 26-29 August, 2019.

### *Conference Organization Committees*

3rd PanHellenic Conference of Data Analysis with International Participation (Sithonia Chalkidiki, 15–18 September, 2005).

4th PanHellenic Conference of Data Analysis with International Participation (Karditsa, 13–15 September, 2007).

5th PanHellenic Conference of Data Analysis with International Participation (Rethymno, 10–12 September, 2009).

6th PanHellenic Conference of Data Analysis with International Participation (Thessaloniki, 8–11 September, 2011).

7th PanHellenic Conference of Data Analysis with International Participation (Kavala, 12–14 September, 2013).

8th PanHellenic Conference of Data Analysis with International Participation (Alexandroupoli, 10-12 September, 2015).

9th PanHellenic Conference of Data Analysis with International Participation (Thessaloniki, 28-30 September, 2017).

IFCS-2019, Symposium of the International Federation of Classification Societies (IFCS), Thessaloniki, 26-29 August, 2019.

### **PhD, Master, and Final Year Project supervisor/co-supervisor**

2 PhD Theses (supervisor)

5 PhD Theses (co-supervisor)

10 Master Theses (supervisor)

21 Final Year BSc Projects (supervisor)

### **Summary of Research Activity**

39 Papers in International Refereed Journals.

16 Chapters in International Conference Proceedings / Books.

13 Papers in National (Greek) Refereed Journals.

9 Chapters in National (Greek) Conference Proceedings.

89 Conference Presentations [36 in International and 53 in National (Greek)].

7 Software Packages (3 in R).

19 Funded Research Projects (as collaborator).

1 Thesis (PhD).

651 Citations in Google Scholar (61 papers), h-index = 12, i10-index = 15, g-index = 22.

288 Citations in Scopus (44 papers), h-index = 7.

162 Citations in Web of Science (Science Citation Index) (28 papers), h-index = 5.