

Publications of Marianna Bolla

Books and book chapters

1. Bolla M., Szabados T., Multidimensional Stationary Time Series. Dimension Reduction and Prediction (273 pages). CRC Press, Taylor & Francis Group, a Chapman & Hall book (2021). ISBN: 9780367569327
2. Bolla, M. 2017. Factor Analysis, Dynamic. Wiley StatsRef: Statistics Reference Online: 1-15. John Wiley&Sons, Ltd. (ISBN 9781118445112). doi: 10.1002/9781118445112.stat07505.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/9781118445112.stat07505.pub2/full>
3. Bolla, M., Spectral Clustering and Bioclustering. Learning Large Graphs and Contingency Tables. Wiley, 2013.
4. Bolla, M., On the Spectra of Weighted Random Graphs Related to Social Networks. In: Social Networksd: Development, Evaluation and Influence, Hannah L. Schneider and Lilli M. Huber eds, Nova Science Publishers, Incorporated, 2008, New York (326 pages), pp. 131-158. ISBN: 1604568003, 9781604568004.
5. Bolla M., Krámlí A., Statisztikai következtetések elmélete = Theory of statistical inference (textbook in Hungarian). Typotex, Budapest, 1st ed. 2005, 2nd ed. 2012.
6. Bolla M., Linear algebraic tools. Chapter in the book Többváltozós statisztikai analízis = Multivariate Statistical Analysis (first Hungarian book on this topic), (eds Móri F. T., Székely J. G.), pp. 375-387. Budapest, Műszaki Könyvkiadó, 1986.
7. Abdelkhalek, F. and Bolla, M., Application of Structural Equation Modeling to Infant Mortality Rate in Egypt. In: The Springer Series on Demographic Methods and Population Analysis (book series). Eds. Skiadas, Christos H., Skiadas, Charilaos (PSDE, vol. 50). Cham, Switzerland: Springer International Publishing (2020), pp. 89-99. ISBN: 978-3-030-44695-6.

Journal papers

1. Bolla, M., Ye, D., Wang, H., Ma, R., Frappier, V., Thompson, W., Donner, C., Baranyi, M., and Abdelkhalek, F., Causal Vector Autoregression Enhanced with Covariance and Order Selection, *Econometrics* **11**(1), 7 (2023).
2. Bolla, M., Winstein, V., You, T., Seidl, F., Abdelkhalek, F., Regularity-based spectral clustering and mapping the Fiedler-carpet, *Special Matrices* **10** (2022), 394-416 (De Gruyter Open).

3. Bolla, M., Szabados, T., Baranyi, M., Abdelkhalek, F., Block circulant matrices and the spectra of multivariate stationary time sequences, *Special Matrices* **9** (2021), 36-51 (De Gruyter Open).
4. Bolla, M., Abdelkhalek, F., Kálmán's Filtering Technique in Structural Equation Modeling, *Stud. Univ. Babeş-Bolyai Math.* **66** (2021), No. 1, 179-196.
5. Baranyi, M., Bolla, M., Iterated Conditional Expectation Algorithm on DAGs and Regression Graphs, *Econometrics and Statistics* **20** (2021), 131-152.
6. Bolla, M., Generalized quasirandom properties of expanding graph sequences, *Nonlinearity* **33** No.4 (2020), 1405-1424.
7. Bolla, M. and Abdelkhalek, F., Bi-classified block models as mixtures of standardized contingency tables with Beta-distributed entries, *Libertas Mathematica* (new series), **39**. 1 (2019), pp 1-12. DOI: <http://dx.doi.org/10.14510>
8. Bolla, M., Mala, J., Elbanna, A., Estimating parameters of a directed weighted graph model with beta-distributed edge-weights, *Journal of Mathematical Sciences* **237** No.05 (2019), pp. 611-620.
9. Bolla, M., Abdelkhalek, F., Baranyi, M., Graphical models, regression graphs, and recursive linear regression in a unified way, *Acta Scientiarum Mathematicarum (Szeged)* **85**, (2019), 9–57.
10. H. Reittu, I. Norros, T. Räty, M. Bolla, F. Bazsó, Regular decomposition of large graphs: foundation of a sampling approach to stochastic block model fitting, *Data Science and Engineering* (2019), 1-17.
11. Bolla, M., Elbanna, A., Discrepancy minimizing spectral clustering, *Discrete Applied Mathematics* **243** (2018), 286-289.
12. Bolla, M., Elbanna, A., Multiple interaction strategies in networks related to graph spectra and dominant sets, *Libertas Mathematica* (New Series) **37** (2017), no. 1. 1-24.
13. Bolla, M., Elbanna, A., Matrix and discrepancy view of generalized random and quasirandom graphs graphs, *Special Matrices*, Volume 4, Issue 1, Pages 31–45, ISSN (Online) 2300-7451, De Gruyter Open (2016).
14. Bolla, M., Relating multiway discrepancy and singular values of non-negative rectangular matrices, *Discrete Applied Mathematics* **203** (2016), 26-34.
15. Bolla, M., Bullins, B., Chaturapruek, S., Chen, S., Friedl, K., Spectral properties of modularity matrices, *Linear Algebra and Its Applications* **73** (2015), 359-376.

16. Bolla, M., Elbanna, A., Estimating parameters of a probabilistic heterogeneous block model via the EM algorithm, *Journal of Probability and Statistics*, vol. 2015, Article ID 657965, 14 pages, (2015). doi:10.1155/2015/657965.
17. Bolla, M., SVD, discrepancy, and regular structure of contingency tables, *Discrete Applied Mathematics* **176** (2014), 3-11.
18. Bolla, M., Modularity spectra, eigen-subspaces and structure of weighted graphs, *European Journal of Combinatorics* **35** (2014), 105-116.
19. Bolla, M., Kói, T., Krámlí, A., Testability of minimum balanced multiway cut densities, *Discrete Applied Mathematics* **160** (2012), 1019-1027.
20. Bolla, M., Spectra and structure of weighted graphs, *Electronic Notes in Discrete Mathematics* **38** (2011), 149-154.
21. Bolla, M., Penalized versions of the Newman–Girvan modularity and their relation to normalized cuts and k-means clustering, *Physical Review E* **84** (1), 016108 (2011).
22. Bolla, M., Beyond the expanders, *International Journal of Combinatorics*, Paper 787596 (2011).
23. Bolla, M., Kurdyukova, A., Dynamic factors of macroeconomic data, *Annals of the University of Craiova, Mathematics and Computer Science Series* **37** (4) (2010), 18-28.
24. Bolla, M., Friedl, K., Krámlí, A., Singular value decomposition of large random matrices (for two-way classification of microarrays), *Journal of Multivariate Analysis* **101** (2010) 434-446.
25. Bolla, M., Noisy random graphs and their Laplacians, *Discrete Mathematics* **308** (2008), 4221-4230.
26. Bolla, M., Recognizing linear structure in noisy matrices, *Linear Algebra and Its Applications* **402** (2005), 228-244.
27. Bolla, M., Distribution of the eigenvalues of random block-matrices. *Linear Algebra and its Applications* **377** (2004), 219-240.
28. Bolla, M., Molnár-Sáska, G., Optimization problems for weighted graphs and related correlation estimates, *Discrete Mathematics* **282** (2004), 23-33.
29. Bolla, M., Molnár-Sáska, G., Isoperimetric Properties of Weighted Graphs Related to the Laplacian Spectrum and Canonical Correlations, *Studia Sci. Math. Hung.* **39** (2002), 425-441.
30. Bolla, M., Tusnády, G., Hipergráfök összefüggőségének vizsgálata a spektrumon keresztül = Investigating connectivity of hypergraphs by spectra (in Hungarian), *Mat. Lapok* 95/1-2 (2000), 1-27.

31. Bolla, M., Michaletzky, Gy., Tusnády, G., Ziermann, M., Extrema of sums of Heterogeneous Quadratic Forms, *Linear Algebra and its Applications* **269** (1998), 331-365.
32. Bartkó, Gy., Kundra, O., Bolla, M., Zádor, Gy., Sánta, Zs., Horváth, Sz., Arató, M., Vizuális kiváltott válaszok P300 és korai komponensei krónikus schizophren betegeknél, klinikai, neurokognitív és biokémiai összefüggések, *Clinical Neuroscience* **47** (1994), 16-22.
33. Bolla, M., Tusnády, G., Spectra and optimal partitions of weighted graphs, *Discrete Mathematics* **128** (1994), 1-20.
34. Bolla, M., Spectra, Euclidean representations and clusterings of hypergraphs, *Discrete Mathematics* **117** (1993), 19-39.
35. Szilágyi, Á. K., Fráter, R., Bolla, M., Acute-phase proteins in various psychotic states, *Clinical Neuroscience* **46** (3-4) (1993), 114-117.
36. Bolla, M., Hilbert-terek lineáris operátorainak szinguláris felbontása: optimumtulajdonságok statisztikai alkalmazásai és numerikus módszerek = Singular value decomposition of linear operators in Hilbert spaces (in Hungarian), *Alkalmazott Matematikai Lapok* **13** (1987-88), 189-206.
37. Bolla, M., Korrespondenciaanalizis = Correspondence analysis (in Hungarian), *Alkalmazott Matematikai Lapok* **13** (1987-88), 207-230.
38. Bolla, M., Tusnády, G., The QRPS algorithm: a generalization of the QR algorithm for the singular values decomposition of rectangular matrices. *Periodica Mathematica Hungarica* **16** (3) (1985), 201-207.
39. Bolla, M., Kutas, T., Submodels for the nutrient loading estimation on River Zala. *Ecological Modelling* **26** (1984), 115-143.
40. Bolla, M., A QRPS transzformáció: a QR algoritmus általánosítása valós téglalapmátrixok szinguláris felbontására és numerikus algoritmus = The QRPS transformation: generalization of the QR algorithm for the SVD of rectangular arrays (in Hungarian), *Alkalmazott Matematikai Lapok* **8** (1982), 125-139.
41. Bolla M., Decomposition of Matrices in a Genetic Problem (abstract). *Biometrics* **37** (4) (1981), p. 845.
42. Bolla, M., Tusnády, G., Classification of multigraphs via spectral techniques, *Periodica Polytechnica Ser. Civil Eng.* **36** (4) (1992), 375-391.
43. Benyó Z., Bolla M., Teleghi L., Tick J., Benyó I., Nagy P., Kórhai beteganyag számítógépes statisztikai elemzése szakértői rendszer kialakításához = Statistical study of hospitalized patients data for a computerized expert system (in Hungarian), *Mérés és Automatika* **37** (6) (1989), 375-391.

In conference proceedings

1. Baranyi, M., Bolla, M., Kocsisné Szilágyi, Gy., A novel dynamic Principal Component Analysis method applied to ECG signals. In: Matthews, M. B. (ed.), Conference Record of the Fifty-Fifth Asilomar Conference on Signals, Systems and Computers (2021), Piscataway (NJ) USA. IEEE (2022), pp. 265-269.
2. Bolla, M., Baranyi, M., Abdelkhalek, F., Dimension Reduction of High Frequency and High Dimensional Data in Time and Space. In: HU-MATHS-IN Success Stories of Mathematical Short-term Projects for Industry in 2017-2021, Zoltán Horváth (ed.), Széchenyi István Egyetem, Győr (2021). ISBN: 978-615-5837-99-9.
3. Abdelkhalek, F. and Bolla, M., Predictive Capability of the PLS-SEM Modeling with Application. In: Skiadas, C. H. (ed.), Proc. 6th STMDA International Conference with Demographic Workshop, Barcelona, Spain (2020), International Society for the Advancement of Science and Technology (ISAST), pp. 1-12.
4. Bolla, M., Discrepancy and spectra. In: Abstract book of the Joint Austrian–Hungarian Mathematical Conference (AUSHUN 2015), August 25-27, 2015, Győr, p. 4.
<http://bolyai.hu/aushun15/>
5. Bolla, M., Elbanna, A., Extending the Rash model to a multiclass parametric network model. In: Proceedings of the 1st International Conference on Future RFID Technologies, 5-7 November, 2014, Eger, Eszterházy Károly College (ed. G. Kruspér), pp. 15-22, 2014.
doi:10.17048/FutureRFID.1.2014.15
<http://futurerfid.ektf.hu/?p=papers>
6. Bolla, M., General latent variable models of PLS enhanced with spectral techniques and representations in Hilbert spaces. In: Book of Abstracts of the 8th International Conference on Partial Least Squares and Related methods (PLS 2014), 26-28 May, 2014, Paris, CNAM and ESSEC (ed. V. E. Vinzi and G Saporta), pp. 37-38.
7. Bolla, M., SVD, discrepancy and regular structure of contingency tables. In: Abstract book of the 29th European Meeting of Statisticians (EMS 2013), July 20-25, 2013, Budapest (ed. L. Márkus and V. Prokaj), p. 56.
8. Bolla, M., Elbanna, A., Priksz, I., Spectra and multiple strategic interaction in networks. In: Abstract book of the 29th European Meeting of Statisticians (EMS 2013), July 20-25, 2013, Budapest (ed. L. Márkus and V. Prokaj), p. 97.
9. Bolla, M., Spectral clustering and biclustering. In: Abstract book of

- the Conference on Graph spectra and Applications, CMR, Barcelona, July 16-19, 2012.
10. Bolla, M., Parametric and nonparametric approaches to recover regular graph partitions. In: Proc. of the 14th ASMDA Conference, ed. R. Manca and C. H. Skiadas, June 7-10, 2011, Universita di Sapienza, Roma, pp. 164-171.
 11. Bolla, M., Statistical inference on large contingency tables: convergence, testability, stability. In: Proc. of the COMPSTAT'2010: 19th International Conference on Computational Statistics, Paris. Physica-Verlag, Springer (2010), 817-824.
 12. Bolla, M., Dynamic factors of economic data. In: abstracts of the 3rd International Conference on Computational and Financial Econometrics (CFE09), Limassol, Cyprus, October 29-31, 2009, ed. S.P. Azen, p.72.
 13. Bolla, M., Friedl, K., Krámlí, A., SVD of large random matrices (for two-way classification of microarrays). In: Functional and Operatorial Statistics, Toulouse 2008, ed. Sophie Dabo-Niang, Frédéric Ferraty, Physica-Verlag, Springer (2008), 65-70.
 14. Bolla, M., Friedl, K., Kói, T., Krámlí, A., Testability of the minimum balanced k -way cut density, In: Abstracts of the international conference of Rényi Inst. "Fete of Combinatorics and Computer Science" (ed. Sali, A.), Keszthely, 2008.
 15. Bolla, M., Random noise in data analysis, abstract in the Proc. of ASMDA'2007, Chania, Greece (2007), Ed. C. H. Skidas, p.26.
 16. Bolla, M., Wigner-noise on random matrices with remarkable linear structure (applicable to cellular networks). In: Proc. of the 26th International Conference Information Technology Interfaces, ed. V. Luzar, V. H. Dobric, Cavtat, Croatia, June 7-10, 2004. SRCE Computing Centre, University of Zagreb (2004), 215-220.
 17. Bolla, M., Parallel factoring of strata. In: Proc. of the 23th International Conference Information Technology Interfaces, ed. Kalpic, Damir et al., Pula, Croatia, June 19-22, 2001. SRCE Computing Centre, University of Zagreb (2001), 259-266.
 18. Bolla, M., Tusnády, G., An iterative method for clustering simultaneously objects and variables of dichotomous character. In: Proceedings of the DIANA II. Conference on Discriminant Analysis, Cluster Analysis and other methods of data classification, Liblice, 1987. Math. Inst. of the Czechoslovak Academy of Sciences. 77-82.
 19. Bolla, M., Tusnády, G., A method for singular values decomposition of general real matrices. In: Proceedings of the Third Pannon Sympo-

- sium on Mathematical Statistics, Visegrád, 1982. (Ed.: J. Mogyoródi, I. Vincze, W. Wertz). Budapest, Akadémiai Kiadó (1983), 9-18.
20. Bolla, M., Tusnády, G., A method for Singular Values Decomposition of Real Matrices (abstract). In: Proceedings of COMPSTAT'82 in Computational Statistics, Part II. Toulouse (H. Cossinus, P. Ettinger, J. R. Mathieu). Wien. Physica-Verlag (1982). 37-38.
 21. Bolla M., Tusnády G., Hipergráfok euklideszi térbe való beágyazása veleszületett rendellenességek clusterezéséhez. In: Számítástechnikai és kibernetikai módszerek az orvostudományban és a biológiában, 11. Kollokvium Közleményei, Szeged, 1982 (Győri, I., Csirik, J., Eller, J., Madarász, I.). Szeged. Neumann János Számítógéptudományi Társaság (1984). 169-173.
 22. Bolla, M., Kutas, T., The Nutrient Loading Simulation of Lake Balaton. In: Proceedings of Simulation of Systems in Biology and Medicine. Prague, 1982. Microfische No. 515.
 23. Bolla M., Veleszületett rendellenességek közti kapcsolatok megállapítása mátrixok szinguláris felbontásával. In: Számítástechnikai és kibernetikai módszerek az orvostudományban és a biológiában, 10. Kollokvium Közleményei, Szeged, 1980 (Muszka D., Madarász I.). Szeged. Neumann János Számítógéptudományi Társaság (1981). 1-8.
 24. Bolla M., Decomposition of Matrices in a Genetic Problem. In: Proceedings of the Third Hungarian Biometric Conference, Budapest, 1981. Budapest (1981), 175-181.
 25. Bolla M., Modelling the Influence of the Watershed on the Eutrophication of Lake Balaton. In: Proceedings of Simulation of Systems in Biology and Medicine, Vol. II., Prague, 1980. Prague (1980), 70-78.
 26. Bogárdi I., Bolla M., Stochastic Phosphorus Loading Model for Lake Balaton. Int Proceedings of the Second Joint MTA/IIASA Task Force Meeting on Lake Balaton Modelling, II., Veszprém, 1979 (G. van Straten, S. Herodek, J. Fischer, I. Kovács). Veszprém. MTA VEAB (1980), 204-220.
 27. Dávid L., Teleghi L., Bolla M., A Balaton-vízgyűjtő hierarchikus rendszermodellezése. In: Proceedings of A rendszerelmélet alkalmazásai. Környezetgazdálkodási rendszerek. Rendszerelmélet '79 (*Konferencia Kiadványa*). Sopron. Neumann János Számítógéptudományi Társaság (1979), 114-129.
 28. Wittmann I., Teleghi L., Hoffmann Gy., Bolla M., Bogárdi I., A Balaton-vízgyűjtő és üledék eutrofizációs hatásának modellezése. In: Számítástechnikai és kibernetikai módszerek az orvostudományban és a biológiában, 9. Kollokvium Közleményei, Szeged, 1978 (Muszka D., Madarász I., Székely S.). Szeged. Neumann János Számítógéptudományi Társaság (1979),

- 51-66.
29. Bolla M., Czeizel A., Telegdi L., Tusnády G., Többszörös veleszületett rendellenességek statisztikai vizsgálata. In: Számítástechnikai és kibernetikai módszerek az orvostudományban és a biológiában, 9. Kolokvium Közleményei, Szeged, 1978 (Muszka D., Madarász I., Székely S.). Szeged. Neumann János Számítógéptudományi Társaság (1979). 154-165.
 30. Bolla, M., Csiszár, A., Czeizel, E., Telegdi, L., Tusnády, G., Statistical investigation of multiple congenital malformations. Transactions of the Eight Prague Conference on Information Theory, Statistical Decision Functions, Random Processes. Vol. B., Publishing House of the Czechoslovak Academy of Sciences (1978), 301-307.

Research reports, theses, and arXiv papers

1. Bolla, M. and Zhou, D., Percolated stochastic block model via EM algorithm and belief propagation with non-backtracking spectra (2023), <https://arxiv.org/abs/2307.16502v2>.
2. Bolla, M. et al., Causal Vector Autoregression Enhanced with Covariance and Order Selection (2022), <https://arxiv.org/abs/2211.14203v1>.
3. Bolla, M., Winstein, V., You, T., Seidl, F., Abdelkhalek, F., Regularity based spectral clustering and mapping the Fiedler-carpet (2021), <https://arxiv.org/abs/2112.10637v2>.
4. Bolla, M., Elbanna, A., Mala, J., Estimating parameters of a directed weighted graph model with beta-distributed edge-weights (2017), arXiv:1707.08904v3.
5. Bolla, M., Generalized quasirandom properties of expanding graph sequences (2017), arXiv:1508.04369v7.
6. Bolla, M., Clustering graphs and contingency tables with spectral methods, MTA Doctoral Dissertation (2016), electronic library of HAS.
7. Bolla, M., Kim, E., Koo, C. W., Properties of the multiway discrepancy (2016), arXiv:1609.08079 [MATH.CO].
8. Bolla, M., Relating multiway discrepancy and singular values of contingency tables (2014), arXiv:1408.6443.
9. Bolla, M., Elbanna, A., Estimating parameters of a multipartite log-linear graph model via the EM algorithm (2014), arXiv:1411.7934v3.
10. Bolla, M., Bullins, B., Chaturapruek, S., Chen, S., Friedl, K., When the largest eigenvalue of the modularity and the normalized modularity matrix is zero (2013), arXiv:1305.2147.
11. Bolla, M., Kói, T., Krámlí, A., Testability of minimum balanced multiway cut densities (2010), arXiv:1001.1623.

12. Bolla, M., Distribution of Eigenvalues of Random Block-matrices. Applications of Modern Mathematical Methods. Lecture Notes of the 5th International CEEPUS Summer School. June 15-28 2001, Ljubljana, Slovenija. 9-12.
13. Bolla, M., Relations between spectral and classification properties of multigraphs. CSc Thesis (1993), MTA Könyvtára (Library of HAS).
14. Bolla, M., Relations between spectral and classification properties of multigraphs, DIMACS Technical Report (1991), 1991-27.
15. Bolla, M., Euclidean representation and coloring of hypergraphs, MTA Rényi Int. (A. Rényi Math. Institute of HAS) Preprint No.78/1989.
16. Bolla, M., Tusnády, Consistent colorings of weighted graphs, MTA Rényi Int. (A. Rényi Math. Institute of HAS) Preprint No.79/1989.
17. Bolla M., Mátrixok spektrál felbontásának és szinguláris felbontásának módszerei = Methods for spectral and singular value decomposition of matrices (in Hungarian), MTA SZTAKI Tanulmányok (Research Report of the Automation and Control Research Institute, HAS) 174, Budapest (1985).
18. Bolla M., Lineáris algebrai segédeszközök = Linear Algebraic Tools (in Hungarian). In the Lecture Note of the Multivariate Statistics course organized by the János Bolyai Math. Society (ed. Lídia Rejtő). Budapest (1983), 4-71.
19. Bolla M., Mátrixok szinguláris felbontásának módszerei és statisztikai alkalmazásai = methods and statistical applications of SVD (in Hungarian). PhD Thesis, Loránd Eötvös University (ELTE), Budapest (1982).
20. Bolla M., Csáki P., Fischer J., Herodek S., Hoffmann Gy., Kutas T., Telegdi L., Wittmann I., A balatoni ökoszisztema modellezése = Modeling the ecosystem of Lake Balaton (in Hungarian), MTA SZTAKI Tanulmányok (Research Report of the Automation and Control Research Institute, HAS) 93, Budapest (1979).
21. Bolla M., Czeizel A., Kiss P., Pázsi A., Telegdi L., Tusnády G., Statistical study on the multiple congenital malformations in Hungary, MTA Rényi Int. (A. Rényi Math. Institute of HAS), Preprint No.23/1978.

Electronic notes and manuals

1. Bolla M., Csicsman J., Algoritmikus modellek és tanulóalgoritmusok a statisztikában. Elektronikus jegyzet (szerk. Ferenczi M.), készült a TÁMOP4.1.2.A/1-11/0064, Matematikai és fizikai képzés a természettudományos, a Műszaki és az informatikai felsőoktatásban (BME TTK, ELTE TTK) pályázat keretében, 2013 (<http://tamop2013.math.bme.hu/3.html>).

2. Bolla M., Krámlí A., Nagy-György J., Többváltozós statisztika módszerek. Elektronikus jegyzet, készült a Szegedi Tudományegyetem TÁMOP4.1.2.A/1-11/1-2011-0025 pályázata keretében, 2013.
3. Bolla, M., Multiple correspondence analysis. In: DISTAN (Discrete Statistical Analysis) 2.0 *Manual* (ed. Rudas, T.) (1992), 187-198.
4. Bolla, M., Tusnády, G., Clustering of binary data. In: DISTAN (Discrete Statistical Analysis) 2.0 *Manual* (ed. Rudas, T.) (1992), 211-226.

Popular

Bolla, M., Az élő legenda: C.R. Rao 100 éves. Érintő e-matlap, 2020. szeptember (in Hungarian). URL: <https://ematlap.hu/fooldal-2020-13>