

# Curriculum Vitae of Dimitris Kugiumtzis

as of October 2017



## Current Position:

Professor, Department of Electrical and Computer Engineering, Faculty of Engineering, Aristotle University of Thessaloniki (AUTH), Greece

Homepage: <http://users.auth.gr/dkugiu>

E-mail: dkugiu@auth.gr

## Education:

- B.Sc. obtained in 1987 at the Department of Mathematics, AUTH
- Cand. Scient (M.Sc.) obtained in 1991 at the Division of Data Analysis, Signal and Image Processing (then called Cybernetics and Mathematical Modeling), Department of Informatics, University of Oslo, Norway.
- Doktor Scient (PhD) obtained in 1997 at the Division of Data Analysis, Signal and Image Processing, Department of Informatics, University of Oslo, Norway.

## Professional Experience:

- Full Professor at the Institute of current position (from 10/2/2017)
- Associate Professor at the Institute of current position (2010 – 2017)
- Assistant Professor at the Institute of current position (2001 – 2010)
- Lecturer B at the Department of Statistics, University of Glasgow, UK (2000-2001)
- Guest Scientist (postdoc) at the Max-Planck-Institute for Physics of Complex Systems, Dresden, Germany (1998-1999)
- Associate Researcher (postdoc) at the National Center for Epilepsy, Norway (1997)

## Expertise and Research Interests:

Linear and nonlinear analysis of time series; connectivity analysis of multivariate time series and complex networks; computational statistics; dynamical systems; chaos and complexity; feature-based classification and clustering; software development; stochastic simulation; data analysis in neuroscience, geophysics, finance, biology and engineering.

## Funded projects:

- Coordinator of the research project titled "Networks and Classification from Granger Causality of Multivariate Time Series with Applications in Neurophysiology" funded by the General Secretariat for Research and Technology, Greece (1/2014 – 10/2015), overall budget: 130000 €
- Project "Granger Causality and Complex Networks from Multi-variate Time Series" of the program for the support of research activity in the Aristotle University of Thessaloniki, budget 4000 € (4/2013 – 4/2014)
- Participation in the project "Smart Open Internet Services for Health, SOHealth" funded by the General Secretariat for Research and Technology, Greece (2013 – 2016), Overall Budget: 800000 €
- Participation in the project "Secure and Revokable Biometric Identification for use in Disparate Intelligence Environments" funded by the General Secretariat for Research and Technology, Greece (4/2011 – 4/2014), Overall Budget: 591365 €
- Participation in the EU funded COST action BM0601 titled "Advanced Methods for the Estimation of Human Brain Activity and Connectivity (NEUROMATH)" (3/2007 - 5/2011)
- Coordinator of the research project titled "Linear and Nonlinear Statistical Analysis of Electroencephalograms for the Prediction of Epileptic Seizures" funded jointly by the National Center for Epilepsy, Norway, and the General Secretariat for Research and Technology, Greece (<http://eeganalysis.web.auth.gr/>)(2006-2009), Overall Budget: 88496 €
- Participation in the research project Archimedes of the Ministry of Education, Greece, dealing with the building of a data base as well as the statistical analysis of anthropometric, biochemical and diet data of Greek athletes (2004 – 2008)
- Coordinator of the thematic network of AUTH for the Statistical and Dynamical Analysis of Socio-economical Systems (SDASS) (<http://web.auth.gr/sdass>) (2006-2007), Overall Budget: 8000 €

- Participation in the EU funded projects TMR: Spatio-Temporal Instabilities in Deformation and Fracture: Mechanics, Materials science and Nonlinear Physics Aspects, 2001-2003.

#### Conferences:

Participated in the organization of one international and three national conferences; main organizer of one national summer school and conference; organized sessions in a number of international conferences; invited speaker in a number of international and national conferences; participated with oral presentation in over 50 international conferences and over 20 national conferences.

Publications: (Sum of times cited without self-citations: 773, *h*-index: 18, source Web of Science (Thomson Reuters): <http://apps.webofknowledge.com> as of 9/10/2017

- 66 papers in international peer-reviewed journals

- 24 papers in international peer-reviewed conference proceedings (1 accepted)

- 28 papers in national conference proceedings (most of them applying peer-reviewing, and 3 accepted)

- 3 chapters in books and 6 Research or Technical Reports

The full list of publications may be found in <http://users.auth.gr/dkugiu/> (Publications)

The publications in **the last five years:**

#### Journals:

1. A. Papana, C. Kyrtsov, **D. Kugiumtzis**, C. Diks, "[Assessment of Resampling Methods for Causality Testing: A note on the US Inflation Behavior](#)", PLOSOne, 12(7): e0180852, 2017
2. E. Siggiridou, V.K. Kimiskidis, **D. Kugiumtzis**, "[Dimension Reduction of Frequency-Based Direct Granger Causality Measures on Short Time Series](#)", Journal of Neuroscience Methods, Vol 289, pp 64-74, 2017
3. **D. Kugiumtzis**, Ch. Koutlis, A. Tsimpiris, V. K. Kimiskidis, "[Dynamics of Epileptiform Discharges Induced by Transcranial Magnetic Stimulation in Genetic Generalized Epilepsy](#)", International Journal of Neural Systems, Vol 27(7), 1750037, 2017.
4. D. Chorozoglou, **D. Kugiumtzis**, E. Papadimitriou, "[Application of complex network theory to the recent foreshock sequences of Methoni \(2008\) and Kefalonia \(2014\) in Greece](#)", Acta Geophysica, 2017, doi:10.1007/s11600-017-0039-4
5. A. Papana, C. Kyrtsov, **D. Kugiumtzis**, C. Diks, "[Financial networks based on Granger causality: A case study](#)", Physica A: Statistical Mechanics and its Applications, Vol 482, pp 65-73, 2017
6. Vlachos, B. Krishnan, D.M. Treiman, K. Tsakalis, **D. Kugiumtzis**, L. D. Iasemidis, "[The Concept of Effective Inflow: Application to Interictal Localization of the Epileptogenic Focus from iEEG](#)", IEEE Transactions on Biomedical Engineering, vol.PP, no.99, pp.1-1 doi: 10.1109/TBME.2016.2633200, 2017
7. V.K. Kimiskidis, A. Tsimpiris, P. Ryvlin, R. Kalviainen, M. Koutroumanidis, A. Valentin, N. Laskaris, **D. Kugiumtzis**, "[TMS combined with EEG in Genetic Generalized Epilepsy: A phase II diagnostic accuracy study](#)", Clinical Neurophysiology, Vol 128(2), pp 367–381, 2017 [See Editorial, pages 365–366].
8. C. Koutlis, **D. Kugiumtzis**, "[Discrimination of Coupling Structures using Causality Networks from Multivariate Time Series](#)", Chaos, 26, 093120, 2016.
9. A. Tsaira, P. Karagiannidis, M. Sidira, S. Kassavetis, **D. Kugiumtzis**, S. Logothetidis, O. Naka, A. L. Pissiotis, K. Michalakis, "[Theoretical Considerations and a Mathematical Model for the Analysis of the Biomechanical Response of Human Keratinized Oral Mucosa](#)", Frontiers in Physiology, Vol 7, Article No 364, 2016
10. G. Koufos, L. de Bonis, **D. Kugiumtzis**, "[New material of the hominoid Ouranopithecus macedoniensis from the Late Miocene of Axios valley \(Macedonia, Greece\) with some remarks on its sexual dimorphism](#)", Folia Primatologica, Vol 87, pp 94-122, 2016
11. E. Siggiridou, **D. Kugiumtzis**, "[Granger Causality in Multi-variate Time Series Using a Time Ordered Restricted Vector Autoregressive Model](#)", IEEE Transactions on Signal Processing, Vol 64(7), pp 1759-1773, 2016.
12. A. Papana, C. Kyrtsov, **D. Kugiumtzis**, C. Diks, "[Detecting causality in non-stationary time series using Partial Symbolic Transfer Entropy: Evidence in financial data](#)", Computational Economics, Vol 47(3), pp 341-365, 2016
13. M. Papapetrou, **D. Kugiumtzis**, "[Markov chain order estimation with parametric significance tests of conditional mutual information](#)", Simulation Modelling Practice and Theory, Vol 61, pp 1-13, 2015

14. G. Papadopoulos, **D. Kugiumtzis**, "[Estimation of connectivity measures in gappy time series](#)", *Physica A*, Vol 346, pp 387-398, 2015
15. V. K. Kimiskidis, Ch. Koutlis, A. Tsimpiris, Reetta Kälviäinen, P. Ryvlin, **D. Kugiumtzis**, "[Transcranial Magnetic Stimulation Combined with EEG Reveals Covert States of Elevated Excitability in the Human Epileptic Brain](#)", *International Journal of Neural Systems*, Vol 25(5), 1550018, 2015.
16. **D. Kugiumtzis**, V. K. Kimiskidis, "[Direct causal networks for the study of transcranial magnetic stimulation effects on focal epileptiform discharges](#)", *International Journal of Neural Systems*, Vol 25, 1550006, 2015.
17. A. Tsouknidas, E. Lympoudi, K. Michalakis, D. Giannopoulos, N. Michailidis, A. Pissiotis, D. Fytanidis, **D. Kugiumtzis**, "[Influence of Alveolar Bone Loss and Different Alloys on the Biomechanical Behavior of Internal-and External-Connection Implants: A Three-Dimensional Finite Element Analysis](#)", *The International Journal of Oral & Maxillofacial Implants*, Vol 30(3), e30-e42, 2015
18. L. Faes, **D. Kugiumtzis**, G. Nollo, F. Jurysta, D. Marinazzo, "[Estimating the decomposition of predictive information in multivariate systems](#)", *Physical Review E*, Vol 91(3), 032904, 2015
19. M. Papapetrou and **D. Kugiumtzis**, "[Investigating long range correlation in DNA sequences using significance tests of conditional mutual information](#)", *Computational Biology and Chemistry*, Vol 53A, pp 32-42, 2014
20. E. Siggiridou, **D. Kugiumtzis** and V. K. Kimiskidis, "[Correlation Networks for Identifying Changes in Brain Connectivity during Epileptiform Discharges and Transcranial Magnetic Stimulation](#)", *Sensors*, Vol 14, 12585-12597, doi:10.3390/s140712585, 2014
21. P. E. Tsinaslanidis, **D. Kugiumtzis**, "[A Prediction Scheme Using Perceptually Important Points and Dynamic Time Warping](#)", *Expert Systems with Applications*, Vol 41, No 15, 6848-6860, 2014
22. **D. Kugiumtzis**, E. Bora-Senta, "[Simulation of Multivariate Non-Gaussian Autoregressive Time Series with Given Autocovariance and Marginals](#)", *Simulation Modelling Practice and Theory*, Vol 44, 42-53, 2014
23. I. Vlachos, **D. Kugiumtzis**, "[Backward-in-Time Selection of the Order of Dynamic Regression Prediction Model](#)", *Journal of Forecasting*, 2013 [[arxiv: 1301.2410](#)]
24. A. Papana, C. Kyrtsov, **D. Kugiumtzis**, C. Diks, "[Simulation Study of Direct Causality Measures in Multivariate Time Series](#)", *Entropy*, 15(7), 2635-2661, 2013
25. **D. Kugiumtzis**, "[Partial Transfer Entropy on Rank Vectors](#)", *The European Physical Journal Special Topics*, Vol 222, No 2, pp 401-420, 2013
26. **D. Kugiumtzis**, "[Direct coupling information measure from non-uniform embedding](#)", *Physical Review E*, Vol 87, 062918, 2013
27. V. K. Kimiskidis, **D. Kugiumtzis**, S. Papagiannopoulos, N. Vlaikidis, "[Transcranial Magnetic Stimulation \(TMS\) Modulates Epileptiform Discharges in Patients with Frontal Lobe Epilepsy: a Preliminary EEG-TMS Study](#)", *International Journal of Neural Systems*, Vol 23, 1250035, 2013
28. M. Papapetrou, **D. Kugiumtzis**, "[Markov chain order estimation with conditional mutual information](#)", *Physica A*, Vol 392, 1593-1601, 2012 [[arxiv: 1301.0148](#)]
29. A. Papana, **D. Kugiumtzis**, P.G. Larsson, "[Detection of Direct Causal Effects and Application in the Analysis of Electroencephalograms from Patients with Epilepsy](#)", *International Journal of Bifurcation and Chaos*, Vol. 22, No. 9, 1250222, 2012
30. **D. Kugiumtzis**, "[Transfer Entropy on Rank Vectors](#)", *Journal of Nonlinear Systems and Applications*, Vol 3, No 2, pp 73-81, 2012 [[arxiv:1007.0394](#)]
31. A. Tsimpiris, I. Vlachos, **D. Kugiumtzis**, "[Nearest neighbor estimate of conditional mutual information in feature selection](#)", *Expert Systems with Applications*, Vol 39, pp 12697-12708, DOI: 10.1016/j.eswa.2012.05.014, 2012

#### Proceedings of International Conferences

1. K. Trochidis, S. Lui and **D. Kugiumtzis**, "Studying the Relationships between Audio Features and Musical Emotions: a Multivariate Dynamic Approach", *Proceedings of the 16th International Society for Music Information Retrieval Conference*, Malaga, Spain, 26-30 Oct 2015, accepted.
2. E. Siggiridou, Ch. Koutlis, A. Tsimpiris, V.K. Kimiskidis and **D. Kugiumtzis**, "Causality networks from multivariate time series and application to epilepsy", *Proceedings of the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Milan, Italy, 25-29 Aug 2015, accepted.

3. A. Papan, **D. Kugiumtzis**, C. Kyrtsov, "[A Nonparametric Causality Test: Detection of Direct Causal Effects in Multivariate Systems Using Corrected Partial Transfer Entropy](#)", Topics in NonParametric Statistics, eds M. Akritas, S. N. Lahiri, D. Politis, Springer Proceedings in Mathematics and Statistics, Vol. 74, pp 197-206, 2014.
4. C. Koutlis and **D. Kugiumtzis**, "[Discriminating dynamic regimes using measures of causality networks from multivariate time series](#)", 2014 International Symposium on Nonlinear Theory and its Applications (NOLTA 2014), Luzern, 225-228, 2014
5. D. Chorozoglou and **D. Kugiumtzis**, "[Testing the randomness of causality networks from multivariate time series](#)", 2014 International Symposium on Nonlinear Theory and its Applications (NOLTA 2014), Luzern, 229-232, 2014
6. P. Laiou, R. G. Andrzejak, **D. Kugiumtzis**, "[Evaluation of Causality Measures Based on Non-Uniform Embedding Schemes with Application to the Cardiovascular System](#)", [Proceedings of the 8th Conference of the European Study Group on Cardiovascular Oscillations, ESGCO 2014](#), Art No 6847601, pp 225-226, 2014
7. A. Montalto, D. Marinazzo, **D. Kugiumtzis**, G. Nollo, L. Faes, "[Comparing model-free and model-based transfer entropy estimators in cardiovascular variability](#)", [Computing in Cardiology Conference \(CinC\)](#), pp.747-750, 2013
8. A. Tsimpliris, **D. Kugiumtzis**, A. Drosou, C. Ilioudis, G. Pangalos, D. Tzovaras, "[Geometrical facial feature selection for person identification](#)", [Information Fusion \(FUSION\), 2013 16th International Conference on](#), pp.730-735, 2013
9. A. Drosou, A. Tsimpliris, **D. Kugiumtzis**, N. Porfyriou, D. Ioannidis and D. Tzovaras, "[Dimensionality reduction for enhanced 3D face recognition](#)," [Information, Intelligence, Systems and Applications \(IISA\), 2013 Fourth International Conference on](#), pp.1-8, 2013

Editor / Associate Editor

- Guest editor for the Special Session on "Methodological Advances in Brain Connectivity" of the journal "Computational and Mathematical Methods in Medicine", 2012.
- Review Editor of Frontiers in Fractal Physiology, since August 2011

Reviewer:

Reviewing over 20 papers per year in various journals in the disciplines of physics, statistics, engineering, informatics, neuroscience, and less frequently geophysics and finance. Regular reviewer of Physical Review and IOP journals, Annals of Biomedical Engineering, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Neural Systems and Rehabilitation Engineering. Reviewer in several IEEE conference proceedings.

Included in the list of [100 Outstanding Referees](#) for the journals of the American Physical Society for the year 2015.

Evaluator:

- Evaluator of proposals under the INTAS EU program (2003-2007), Marie-Curie EU program (2006), Research Promotion Foundation of Cyprus (2011 - 2013), National Centre for Research and Development of Poland (since 2013), National Centre of Science and Technology Evaluation of Kazakhstan (2015), Russian Science Foundation (RSF) (since 2015) and Research Foundation Flanders of Belgium (since 2014).
- Evaluator of proposals in several national research programs in Greece (Pythagoras, Synergasia, IKY, Business Support, since 2009)

Supervising:

- Main supervisor of 7 PhD (5 obtained, 2 in progress) and member of the supervising committee for 4 PhD (2 completed) for the period 2004 – to date.
- Main supervisor of over 30 MSc (5 in progress), and member of the supervising committee of over 20 MSc for the period 2003 – to date. Member of the supervising committee of 3 Cand.Scient (Norwegian MSc) for the period 1995 – 1997.

Teaching experience:

- Lecturing a number of undergraduate courses in the Faculty of Engineering, Aristotle University of Thessaloniki (October 2001 – to date).

- Lecturing postgraduate courses at the Department of Mathematics, the Department of Physics, and the Department of Civil Engineering of the Aristotle University of Thessaloniki (October 2002 – to date).
  - Lectured undergraduate and postgraduate courses on Statistics at the Department of Statistics and the Department of Computer Science, University of Glasgow, Scotland, U.K. (January 2000 – June 2001).
  - Lectured postgraduate courses on Dynamics and Times Series at the Department of Informatics, University of Oslo, Norway (1993 – 1997).
  - Lecturer of Erasmus course “Time series analysis”, University of Galway, Ireland, June 2013.
- The full list of courses may be found in <http://users.auth.gr/dkugiu/> (Teaching)

Administrational experience:

- Administration tasks as staff member in all Institutes I served. Member of the Informatics Lab of the Engineering Faculty, AUTH (2009 – to date). Member of several committees of the Department I am currently affiliated to (2013 – to date). Member of the steering committee of the AUTH University campus (2014 – to date). Member of the Steering Committee of the IT Center of AUTH (2017 – to date). Member of steering committee of three inter-departmental post-graduate programs in AUTH as to date.

Real World Applications:

Analysis of data from physiology (EEG, ECG), geophysics (magnetosphere, global climate, earthquakes), engineering (shear strain), finance (exchange rates, market indices) and biology (DNA). Software development, e.g. Matlab toolkit MATS (<http://eeganalysis.web.auth.gr> (Software))

Language Skills:

Greek (mother language) and English: fluent

Norwegian: reading fluent, writing functional, speaking fluent