

SCIENTIFIC CURRICULUM VITAE
RALPH GREGOR ANDRZEJAK
TENURED ASSOCIATE PROFESSOR

JUNE 2017

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Contact

[\(TOP\)](#)

Prof. Dr. Ralph G. Andrzejak

Tenured associate professor – ‘Professor Agregat’ (Since 07/2011)

Born: August 6, 1970 in Düsseldorf, Germany

Director of Nonlinear Time Series Analysis Group

Department of Information and Communication Technologies

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08018 Barcelona

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AFFILIATIONS

[\(TOP\)](#)

- 07/2011-present Director of Nonlinear Time Series Analysis Group
Department of Information and Communication Technologies
Universitat Pompeu Fabra, Barcelona, Spain
- 03/2016-present Associated Researcher
Institute for Bioengineering of Catalonia (IBEC)
Barcelona, Spain
- 01/2007-7/2011 Ramón y Cajal - tenure track research fellow
Department of Information and Communication Technologies
Universitat Pompeu Fabra, Barcelona, Spain
Personal competitive grant: Spanish Ministry of Science and Innovation
- 01/2005-12/2006 Postdoctoral fellow
Computational Neuroscience group
Department of Technology
Universitat Pompeu Fabra, Barcelona, Spain
Mentor: Prof. G. Deco
Personal competitive grant: Feodor Lynen fellowship of the
Alexander von Humboldt-Foundation, Germany
- 01/2002-12/2004 Postdoctoral fellow
Complex systems group
John von Neumann-Institute for Computing
Research Center Jülich, Jülich, Germany
Mentor: Prof. P. Grassberger

STUDIES

[\(TOP\)](#)

- 09/1999-12/1999 Research fellow (embedded in PhD)
Krasnow Institute for Advanced Studies
George Mason University, Fairfax, Virginia, USA
Mentor: Prof. S.J. Schiff
Personal competitive grant: ‘German Academic Exchange Service’
- 12/1997-09/2001 PhD-Thesis in Physics (Summa Cum Laude)
‘The epileptic process as a nonlinear deterministic dynamics: An investigation of brain electrical activity using nonlinear and linear time series analysis.’ (In German)
Department of Epileptology &
Institute of Radiation and Nuclear Physics
University of Bonn, Germany
Supervisors: Prof. CE Elger
Prof. P. David
- 11/1996 -11/1997 Diploma-Thesis in Physics
‘Fraction of nonlinear determinism in time series: Theory, simulation, and application to brain electrical activity of patients undergoing the pre-surgical epilepsy diagnosis.’ (In German)
Department of Epileptology &
Institute of Radiation and Nuclear Physics
University of Bonn, Germany
Supervisors: Prof. CE Elger
Prof. P. David
- 10/1991- 08/1996 Study of physics, University of Bonn, Germany

SCIENTIFIC PUBLICATIONS – OVERVIEW

[\(TOP\)](#)

Here only an overview is provided. Detailed lists of all publications and contributions can be found at the end of this document and are linked from this page.

INDEXED JOURNAL ARTICLES

62 publications indexed in the **ISI Web of Science**.

Breakdown:

- 39 **peer-reviewed** journal articles [\(link\)](#)
 - 13 first authorships peer-reviewed research articles (10 in Q1)
 - 8 senior (last) authorships peer-reviewed research articles (5 in Q1)
 - 17 co-authorships peer-reviewed research articles (12 in Q1)
 - 1 co-authorship peer-reviewed review article (1 in Q1)
- 4 invited review articles (2 in Q1) [\(link\)](#)
- 2 editorial articles (1 in Q1) [\(link\)](#)
- 17 articles in conference proceedings [\(link\)](#)

Q1: published in journal among the top 25% of their field (ISI).

CITATIONS

ISI-Web of Science: >2900 citations, h-index: 25

Scopus: >3300 citations, h-index: 26

Google Scholar: >5300 citations, h-index: 32

HIGHLIGHTS

5th-most cited article of all 2315 research articles in Physical Review E, 2001

Most cited article of all 113 research articles in Epilepsy Research, 2003

Most cited article of all 293 research articles in Clinical Neurophysiology, 2005

Review paper in Brain 2007 classified as highly cited article by ISI Web of Science

CONFERENCE PRESENTATIONS

- Total of 115 presentations in 73 international conferences [\(link\)](#)
- First and presenting author of 28 contributed talks and 10 contributed posters [\(link\)](#)
- Presented 10 invited plenary conference talks [\(link\)](#)
- Presented 2 invited conference talks in non-plenary sessions [\(link\)](#)
- Co-author of 19 conference talks and 48 posters [\(link\)](#)
- Organizer of 9 peer-reviewed conference symposia [\(link\)](#)
- First author of 4 conference related book chapters
- Co-author of 6 conference related book chapters
- 4 talks and 1 poster awarded with competitive travel fellowships
- This work was presented in 18 different countries (*USA 19; Germany 11; Spain 9; Russia, United Kingdom, Italy each 5; Sweden 3; Poland, Greece, France, Japan, Hungary each 2, Switzerland Turkey, Canada, Argentina, Czech Republic, South Korea each 1*).

INVITED SCIENTIFIC SEMINARS AND TUTORIALS

26 invited scientific seminars and lectures in international universities, hospitals and research institutions. [\(link\)](#)

JOURNAL IMPACT FACTOR AND QUARTILES

The following table lists the impact factors, rankings and according quartiles for all journals in which Prof. Andrzejak published his 39 peer reviewed journal articles.

Journal Title	Area	Impact factor (ISI)	Journal Rank / Journals in Area	Percentile [1-100]	Quartile Q1-Q4
Brain	Clinical Neurology	10.103	5/193	98	Q1
Chaos	Applied Mathematics	2.049	17/254	94	
Physical Review Letters	Physics Multidisciplinary	7.645	6/79	93	
Scientific Reports	Multidisciplinary Sciences	5.228	7/63	90	
Physical Review E	Physics Mathematics	2.252	6/53	90	
New Journal of Physics	Physics Multidisciplinary	3.570	10/79	88	
Physica D	Applied Mathematics	1.579	32/254	88	
PLOS ONE	Multidisciplinary Sciences	3.057	11/63	83	
Frontiers in Human Neuroscience	Psychology	3.634	14/76	82	
Brain Topography	Clinical Neurology	3.727	41/193	79	
Europhysics Letters	Physics Multidisciplinary	1.964	19/79	77	
Clinical Neurophysiology	Clinical Neurology	3.426	49/193	75	Q2
IEEE Transactions on Audio Speech and Language Processing	Engineering, Electrical & Electronic	1.877	78/257	70	
Journal of Neurophysiology	Physiology	2.653	32/83	62	
Epilepsy & Behaviour	Clinical Neurology	2.332	95/193	51	Q3
Epilepsy Research	Clinical Neurology	2.237	101/193	48	
Journal of Neuroscience Methods	Neuroscience	2.053	175/256	32	

COMPETITIVE GRANTS

[\(TOP\)](#)

GRANTS AS PRINCIPAL INVESTIGATOR

- 01/15-12/17:** *Understanding neuronal dynamics in the brain of epilepsy patients at the microscopic scale (FIS2014-54177-R)*
Funded by: Spanish Ministry of Economy and Competitiveness
PI: R.G. Andrzejak
Participating nodes: Universitat Pompeu Fabra, Barcelona, Spain
Department of Epileptology, University Bonn, Germany
- 01/15-12/18:** *Complex Oscillatory Systems: Modeling and Analysis (COSMOS)*
Funded by: European Commission, Horizon 2020 program, European Joint Degree project
Project coordinator: A Pikovsky, PI at University Potsdam, Germany
Local PI: RG Andrzejak, PI at Universitat Pompeu Fabra, Barcelona, Spain
Participating nodes: University of Aberdeen (UK), University of Lancaster (UK), University of Florence (Italy), VU University Amsterdam (Netherlands), Faculty of Information Studies, Novo Mesto, (Slovenia), Medical University of Graz (Austria), University Potsdam (Germany).
- 03/14-08/17:** *Nonlinear signal analysis of microelectrode recordings from epilepsy patients*
Funded by: Volkswagen Foundation
PIs: R.G. Andrzejak, F. Mormann
Participating nodes: Universitat Pompeu Fabra, Barcelona, Spain
Department of Epileptology, University Bonn, Germany
- 01/11-06/14:** *Using nonlinear analysis of electrophysiological recordings to predict epileptic seizures and localize epileptic foci (FIS2010-18204)*
Funded by: Spanish Ministry of Science and Innovation
PI: R.G. Andrzejak
Participating nodes: Universitat Pompeu Fabra, Barcelona, Spain
Department of Epileptology, University Bonn, Germany
Hospital del Mar -Institut Municipal d'Investigació Mèdica, Barcelona, Spain

GRANTS AS PARTICIPATING INVESTIGATOR

- 01/15-12/19:** *Recognition of Department of Information and Communication Technologies as Maria de Maetzu Center of Excellence*
Funded by: Spanish Ministry of Economy and Competitiveness
PI: X. Serra acts as scientific director
R.G. Andrzejak acts as one of the six so-called guarantor faculty members

- 10/07-11/12:** *Brainglot - Bilingüismo y Neurociencia Cognitiva- Programa Consolider Ingenio 2010*
 Funded by: Spanish Ministry of Science and Innovation.
 PI: N. Sebastián Gallés
 Participating nodes: Barcelona Science Park, Spain
 University of Barcelona, Spain
 Universitat Pompeu Fabra, Barcelona, Spain
 Jaime I University of Castellón, Spain
 University of the Basque Country, Spain
 Participation as: Ramón y Cajal research fellow
- 10/07-09/10:** *From Detection to Decision: Neurodynamical Model of Higher Order Cortical Processing (BFU2007-61710/BFI)*
 Funded by: Spanish Ministry of Education and Science
 PI: G. Deco
 Participating nodes: Universitat Pompeu Fabra, Barcelona, Spain; Karolinska Institute, Stockholm, Sweden; University of Oxford, United Kingdom
 Universidad Nacional Autónoma de México, Mexico; University of Magdeburg, Germany; Netherlands Institute for Neuroscience, Netherlands
 Participation as: Ramón y Cajal research fellow
- 05/99-12/04:** *Nonlinear analysis of electric potentials and magnetic field in the epileptic brain*
 Funded by: German Research Foundation
 PIs: C.E. Elger, K. Lehnertz,
 Department of Epileptology, University Bonn, Germany
 P. Grassberger
 Research Center Jülich, Germany
 H. Hinrichs
 Clinic for Neurology, Magdeburg, Germany
 Participation as: PhD student (05/99-09/01) and Postdoc (09/01-12/04)
- 09/96-06/01:** *Automated seizure prediction by means of online analysis of the neuronal complexity loss of the electroencephalogram of patients with temporal lobe epilepsy.*
 Funded by: German Research Foundation
 PIs: C.E. Elger, K. Lehnertz
 Department of Epileptology, University Bonn, Germany
 Participation as: Research assistant (09/96-11/97) and PhD student (12/97-06/01)
- 11/97-04/99:** *Characterization of nonlinear deterministic dynamics.*
 Funded by: Intramural grant BONFOR, University of Bonn, Germany
 PIs: C.E. Elger, G. Widman,
 Department of Epileptology,
 University Bonn, Germany
 Participation as: PhD student

ACCREDITATIONS

[\(TOP\)](#)

RESEARCH

06/16	Recognition of six years research track (2010-2015) *
04/15	Scientific career rated as “Excellent” by External Research Evaluation Committee**
10/13	Advanced research accreditation as ‘Professor Catedràtic’ (Full Professor) *
03/11	Research accreditation as ‘Professor Agregat’ (Associate Professor) *
05/12	Recognition of six years research track (2004-2009) *
05/12	Recognition of six years research track (1998-2003) *
02/11	Outstanding research track recognition. I3 program, Spanish Ministry for Science and Innovation

*all issued by the *University Quality Agency of Catalonia* (AQU). Member of the European Association for Quality Assurance in Higher Education.

**AQU-CAER evaluation

TEACHING

<i>pending</i>	Recognition of five years university teaching track (2012-2016) <u>submitted</u> for evaluation to the Universitat Pompeu Fabra, Barcelona, Spain
07/12	Recognition of five years university teaching track (2007-2011) accredited by the Universitat Pompeu Fabra, Barcelona, Spain

THESES SUPERVISION

[\(TOP\)](#)

All theses were/are carried out at the Department of Information and Communication Technologies, Universitat Pompeu Fabra, Barcelona, Spain

PHD THESES

10/16-present	Cristina Gonzales: ‘Understanding neuronal dynamics in the brain of epilepsy patients at the microscopic scale’
10/16-present	Giulia Ruzzene: ‘On the relevance of chimera states for real-world dynamics’
10/15-present	Irene Malvestio: ‘Using nonlinear interdependence measures to detect directional couplings in networks’
10/15-present	Marc Grau: ‘Inverse engineering of complex oscillatory networks’
10/13-10/17	Petroula Laiou: ‘Characterizing interactions from neuronal recordings of epilepsy patients’ – <i>defense pending end 2017</i>
10/07-04/11	Daniel Chicharro: ‘Characterization of information and causality measures for the study of neuronal data’ Grade: Excel·lent cum laude, defended 07/04/2011

MASTER THESES

10/16-present	Javier Bobeda: ‘Application of machine learning techniques to the classification of electroencephalographic recordings’ – <i>defense pending end 2017</i>
10/16-present	Minia Ricoy Castro: ‘Synchronization phenomena in epileptic seizures at different spatial scales’ – <i>defense pending end 2017</i>

- 01/15-07/15 Pau Clusella: ‘Effect of randomizations in a Boolean signaling network’
 10/09-06/10 Sergio Bromberg: ‘Nonlinear times series analysis of musical descriptor time series’
 10/09-09/10 Carlos Santos: ‘Nonlinear Audio Recurrence Analysis with Application to Music Genre Classification’
 10/09-09/10 Toni Urcola: ‘Detection of directional interdependence in pairs of coupled Fitzhugh-Nagumo oscillators’
 10/06-09/07 Daniel Chicharro: ‘Characterization of event-related time-dependent directional couplings’

BACHELOR THESES

- 09/16-present Maria Montana: ‘Detection of non-randomness in peri-ictal recordings from epilepsy patients.’ – *defense pending July 2017*
 09/16-present Nicolás Pérez de Olaguer: ‘Data-driven analysis of chimera states in networks of coupled oscillators.’ – *defense pending July 2017*
 09/15-07/16 Laura Palacio: ‘Characterizing functional connectivity during rest in multiple sclerosis patients versus healthy volunteers using independent component analysis.’
Awarded with the first price for students’ contribution at the 2016, XXXIV congress of the Spanish Society of Biomedical Engineering.
 09/15-07/16 Raül Duaiqües: ‘The Perturbation Method: An evaluation of a novel method to find the onset of generalized synchronization in unidirectional coupled chaotic dynamics.’
 09/15-07/16 Andrea Grau: ‘Assessing Electroencephalographic recordings for epileptic patients at different scales of spatial resolution.’
 09/13-07/14 Daniel Naro: ‘Rank-based predictability score: a new measure for determinism.’
 09/13-07/14 Marta López: ‘Individualized beamformer for Cochlear Implant users.’

GERMAN DIPLOMA THESIS IN PHYSICS

in collaboration with K. Meier, Faculty of Physics and Astronomy, Ruprecht-Karls-University, Heidelberg, Germany.

- 04/06-04/07 Andrej Bicanski: ‘Computational Modelling of Spatially Selective Neurons in the Hippocampal Formation-Potential and Limitations of a Linear Feed-Forward Model’.

COURSE TEACHING

[\(TOP\)](#)

COURSE LIST

- Since 2016 Master course ‘Advanced biosignal analysis’
 Since 2013 Undergraduate course ‘Advanced analysis of neuronal signals’
 Since 2012 Undergraduate course ‘Probability theory and statistics for Biomedical Engineering’
 2011-2016 Undergraduate course ‘Communication in Technical English’
 2011-2013 Undergraduate course ‘Probability theory, statistics and stochastic processes’
 2007-2011 Master course ‘Linear and nonlinear time series analysis’
 2009-2010 Master course ‘Advanced Topics in Information, Communication, and Audiovisual Media Technologies.’
 2006-2008 Undergraduate course ‘Taller de Modelització i Simulació I’

TEACHING INOVATION

Prof. Andrzejak developed the curriculum and course material for all courses listed above. The only exception is 'Probability theory, statistics and stochastic processes' for which he developed new course material according to an existing curriculum.

STUDENTS SATISFACTION

The University Pompeu Fabra uses student surveys to assess the students' satisfaction with the teaching. Over the years in which Prof. Andrzejak is teaching (2006-2017) the questions in these surveys changed. One question which was used throughout the editions asks the students if they were globally satisfied with the teaching of the professor. When these grades are averaged first over the different groups and years of the courses and then over the different courses, Prof. Andrzejak reaches an average grade of: 8.83 out of 10.0

SERVICE WORK FOR UNIVERSITY AND DEPARTMENT (TOP)

- Since 04/16 Academic coordinator of the Master in Computational Biomedical Engineering of the Department of Information and Communication Technologies (DICT) of the Universitat Pompeu Fabra (UPF) in Barcelona, Catalonia, Spain
- Since 01/15 One of the six guarantor faculty members for the recognition of Department of Information and Communication Technologies as Maria de Maetzu Center of Excellence
- Since 04/16 Postgraduate program commission member (DICT, UPF)
- Since 07/12 Research commission member (DICT, UPF)
- Since 02/12 Elected Member of the direction commission of the Polytechnic school (UPF)
- 05/15-01/16 Member of the commission for the design of the Master in Computational Biomedical Engineering (DICT, UPF)
- 11/08-10/10 Academic coordinator of the Master Program in Information, Communication and Audiovisual Media Technologies (DICT, UPF)
- 03/08-08/10 Member of the commission for the design of a degree in Biomedical Engineering (DICT, UPF)
- 08/07-10/10 Member of the commission for the Master Program in Information, Communication and Audiovisual Media Technologies (DICT, UPF)
- 06/07-10/10 Postgraduate program commission member (DICT, UPF)

TECH TRANSFER (TOP)

- Since 06/15 Member of BCN-MEDTECH, which is devoted to consulting, research, development and production in all core MedTech technologies (<https://bcn-medtech.upf.edu/>).
- Since 01/15 Industry partnerships via the European international training network COSMOS are carried out with the following companies: Ambrosys GmbH, Germany; Human Research Institute, Austria; Institute of Metagenomics and Microbial Technologies, Slovenia; Joysys, Austria; TauRx Singapore and Scotland; DI.V.A.L. TOSCANA, Italy; Cybula, United Kingdom; ANT Neuro, Netherlands; eegmagine GmbH, Berlin (See <http://www.uni-potsdam.de/cosmos-itn/about-us/locations-and-partner-institutions/>).

- 09/15-07/16 Cooperation with Mint Labs (Barcelona, Spain, <http://www.mint-labs.com/>) for the bachelor thesis of Laura Palacio.
- Since 09/13 Cooperation with German Hearing Center (Hanover, Germany <https://www.hoerzentrum-hannover.de/en/>) for bachelor thesis of Marta López and further internships of UPF undergraduate students.

CLINICAL PARTNERS

[\(TOP\)](#)

As evidenced by numerous joint publications and granted projects, Prof. Andrzejak maintains stable, long-term collaborations with the following clinical partners.

Mormann F., Lehnertz K., Elger CE.

Department of Epileptology, University Clinics of Bonn, Germany.

Schinder K.

University Hospital Bern, Inselspital, Bern, Switzerland.

Rummel C.

Support Center for Advanced Neuroimaging (SCAN), University Institute for Diagnostic and Interventional Neuroradiology, Inselspital, Bern, Switzerland.

Rocamora R.

Hospital del Mar -Institut Municipal d'Investigació Mèdica, Barcelona, Spain.

CREATION OF PUBLIC DOMAIN DATABASES

[\(TOP\)](#)

Prof. Andrzejak has created the following databases of biomedical data. Both databases are freely available for research purposes.

2001 *Bonn EEG download page*. This database was used in hundreds of studies and publications by others. See <http://ntsa.upf.edu/downloads> or this direct [link](#)

2012 *Bern Barcelona EEG database*. This database was already used in dozens of studies and publications by others. See <http://ntsa.upf.edu/downloads> or this direct [link](#)

REFEREE WORK

[\(TOP\)](#)

Prof. Andrzejak regularly referees for prestigious journals including those listed below.

CROSS-DISCIPLINARY

Nature, Journal of the Royal Society Interface, Scholarpedia

PHYSICS

Physical Review X, Physical Review Letters, Physical Review E, Physica D, New Journal of Physics, Chaos, Physics Letters A, European Journal of Physics B, European Physical Journal Special Topics.

NEUROSCIENCE

PLOS Computational Biology, Human Brain Mapping, Clinical Neurophysiology, NeuroImage, Journal of Neuroscience Methods, Epilepsy Research, Epilepsia, Brain Topography, Neurocomputing, Biological Cybernetics, Neural Networks, International Journal of Neural Systems, Neurological Research, Journal of Physiology Paris.

ENGINEERING

IEEE Transaction on Biomedical Engineering, Physiological Measurement, Journal of Neural Engineering, Journal of Healthcare Engineering, Annals of Biomedical Engineering.

EDITOR WORK

[\(TOP\)](#)

- 08/14-present Review Editor for Frontiers in Computational Physiology and Medicine
- 06/11-09/12 R.G. Andrzejak acted as guest editor for a special issue on ‘Methodological advances in brain connectivity’. The editorial was published in ‘Computational and Mathematical Methods in Medicine’, Volume 2012, ID: 492902, 2012.

AWARDS AND COMPETITIVE PERSONAL GRANTS

[\(TOP\)](#)

- 01/07-07/11 Ramón y Cajal Fellow of the Spanish Ministry for Science and Education
- 01/05-12/06 Feodor Lynen Fellow of the German Alexander von Humboldt-Foundation
- 12/03 Young Investigators Travel Award of the American Epilepsy Society, USA
- 06/02 ‘Golden EuroAttractor’ awarded for the best oral presentation at the 3rd European Interdisciplinary School on Nonlinear Dynamics for System and Signal Analysis, Warsaw, Poland
- 09/99-12/99 Travel grant of the ‘German Academic Exchange Service’ for a research stay at the Krasnow Institute for Advanced Studies, Fairfax, Virginia, USA
- 12/98 Travel grant German Research Foundation for the attendance of the Annual Meeting of the American Epilepsy Society, San Diego, California, USA

MISCELLANEOUS

[\(TOP\)](#)

- Since 2005 Member of the German Alexander von Humboldt-Foundation

SCIENTIFIC PUBLICATIONS–DETAILS JOURNAL ARTICLES ([TOP](#))

All publications listed below are indexed in the ISI Web of Science (see ISI-Researcher ID: <http://www.researcherid.com/rid/H-7923-2012>) and Scopus. Citations refer to the ISI database as of 10.06.2017

PEER-REVIEWED JOURNAL ARTICLES (39)

([RESUME](#))

- 0 citations **Andrzejak RG**, Ruzzene G, Malvestio I (2017) Generalize synchronization between chimera states. *Chaos: An Interdisciplinary Journal of Nonlinear Science*. 27 (5), 053114
- 0 citations Laiou P, **Andrzejak RG** (2017) Coupling strength versus coupling impact in nonidentical bidirectionally coupled dynamics. *Physical Review E*. 95 (1), 012210
- 3 citations **Andrzejak RG**, Rummel C, Mormann F, Schindler K (2016) All together now: Analogies between chimera state collapses and epileptic seizures. *Scientific Reports*. 6. 23000
- 1 citations Schindler K, Rummel C, **Andrzejak RG**, Goodfellow M, Zubler F, Abela E, Wiest R, Pollo C, Steimer A, Gast H (2016) Ictal time-irreversible intracranial EEG signals as markers of the epileptogenic zone. *Clinical Neurophysiology*. 127, 3051-3058
- 5 citations Rummel C, Abela E, **Andrzejak RG**, Hauf M, Pollo C, Müller M, Weisstanner C, Wiest R, Schindler K (2015) Resected Brain Tissue, Seizure Onset Zone and Quantitative EEG Measures: Towards Prediction of Post-Surgical Seizure Control. *PLOS ONE*. 10 (10), e0141023
- 11 citations **Andrzejak RG**, David O, Gnatkovsky V, Wendling F, Bartlomei F, Francione S, Kahane P, Schindler K, de Curtis M. (2015) Localization of epileptogenic zone on pre-surgical intracranial EEG recordings: toward a validation of quantitative signal analysis approaches. *Brain Topography, Brain Topography*. 28(6), 823-837¹
- 1 citation **Andrzejak RG**, Mormann F, Kreuz T (2014) Detecting determinism from point processes. *Physical Review E*. 90:062906
- 5 citations Naro D, Rummel C, Schindler K, **Andrzejak RG** (2014) Detecting determinism with improved sensitivity in time series: Rank-based nonlinear predictability score. *Physical Review E*. 90:032913.
- 3 citations Rocamora R, **Andrzejak RG**, Jimenez-Conde J, Elger CE (2013) Sleep modulation of epileptic activity in mesial and neocortical temporal lobe epilepsy: a study with depth and subdural electrodes. *Epilepsy & Behavior*, 28, 185-190.
- 29 citations Kreuz T, Chicharro D, Houghton C, **Andrzejak RG**, Mormann F (2013) Monitoring spike train synchrony. *Journal of Neurophysiology*. 109, 1457-1472
- 47 citations **Andrzejak RG**, Schindler K, Rummel C (2012) Nonrandomness, nonlinear dependence, and nonstationarity of electroencephalographic recordings from epilepsy patients. *Physical Review E*, 86, 046206
- 13 citations Serrà J, Kantz H, Serra X, **Andrzejak RG** (2012) Predictability of Music Descriptor Time Series and its Application to Cover Song Detection. *IEEE Transactions on Audio, Speech and Language Processing* 20, 514 - 525
- 14 citations **Andrzejak RG**, Kreuz T (2011) Characterizing unidirectional couplings between point processes and flows. *Europhysics Letters*, 96, 50012
- 14 citations Chicharro D, Kreuz T, **Andrzejak RG** (2011) What can time scale parametric spike train distances tell us about the neural code? *Journal of Neuroscience Methods*. 199: 146-165
- 28 citations **Andrzejak RG**, Chicharro D, Lehnertz K, Mormann F (2011) Using bivariate signal analysis to characterize the epileptic focus: The benefit of surrogates. *Physical Review E*, 83, 046203
- 29 citations Kreuz T, Chicharro D, Greshner M, **Andrzejak RG** (2011) Time-resolved and time-scale adaptive measures of spike train synchrony. *Journal of Neuroscience Methods*. 195: 92-106
- 46 citations **Andrzejak RG**, Chicharro D, Elger CE, Mormann F (2009) Seizure prediction: Any better than chance? *Clinical Neurophysiology*, 120, 1465-1478

¹ This is a multicenter study. The first four authors contributed equally. Accordingly, in this [resume](#) this article is counted as co-author publication of Andrzejak RG, not as first author publication.

- 46 citations Chicharro D, **Andrzejak RG** (2009) Reliable detection of directional couplings using rank statistics. *Physical Review E*, 80, 026217
- 24 citations Serra J, Serra X, **Andrzejak RG** (2009) Cross recurrence quantification for cover song identification. *New Journal of Physics* 11, 093017
- 29 citations Kreuz T, Chicharro D, **Andrzejak RG**, Haas JS, Abarbanel HDI (2009) Measuring multiple spike train synchrony. *Journal of Neuroscience Methods* 183:287-299
- 35 citations Mormann F, Osterhage H, **Andrzejak RG**, Weber B, Fernandez G, Fell J, Elger CE, Lehnertz K (2008) Independent delta/theta rhythms in the human hippocampus and entorhinal cortex. *Frontiers in Human Neuroscience*. 2, 3²
- 400 citations Mormann F, **Andrzejak RG**, Elger CE, Lehnertz K. (2007) Seizure prediction: The long and winding road. *Brain* 130, 314-333³
- 96 citations Kreuz T, Mormann F, **Andrzejak RG**, Kraskov A, Lehnertz K, Grassberger P. (2007) Measuring synchronization in coupled model systems: a comparison of different approaches. *Physica D* 225, 29-42
- 24 citations **Andrzejak RG**, Ledberg A, Deco G (2006) Detecting event-related time-dependent directional couplings. *New Journal of Physics*, 8, 6
- 43 citations **Andrzejak RG**, Mormann F, Widman G, Kreuz T, Elger CE, Lehnertz K (2006) Improved characterization of the epileptic brain by focusing on nonlinearity. *Epilepsy Research*, 69, 30-44
- 16 citations Müller A, Osterhage H, Sowa R, **Andrzejak RG**, Mormann F, Lehnertz, K (2006) A distributed computing system for multivariate time series analyses of multichannel neurophysiological data. *Journal of Neuroscience Methods*, 152, 190-201
- 57 citations Smirnov DA, **Andrzejak RG** (2005) Detection of weak directional coupling: Phase-dynamics approach versus state-space approach. *Physical Review E*, 71, 036207
- 243 citations Mormann F, Kreuz T, Rieke C, **Andrzejak RG**, Kraskov A, Elger CE, Lehnertz K (2005) On the predictability of epileptic seizures. *Clinical Neurophysiology*, 116, 569–587⁴
- 99 citations Kraskov A, Stögbauer H, **Andrzejak RG**, Grassberger P (2005) Hierarchical clustering using mutual information. *Europhysics Letters* 70 (2): 278-284
- 32 citations Kreuz T, **Andrzejak RG**, Mormann F, Kraskov A, Stögbauer H, Elger CE, Lehnertz, K, Grassberger P (2004) Measure profile surrogates: A method to validate the performance of epileptic seizure prediction algorithms. *Physical Review E*, 69, 061915
- 10 citations Rieke C, Mormann F, **Andrzejak RG**, Lehnertz K (2004) Improved statistical test for nonstationarity using recurrence time statistics, *Physical Review E*, 69, 046111
- 61 citations **Andrzejak RG**, Kraskov A, Stögbauer H, Mormann F, Kreuz T (2003) Bivariate surrogate techniques: Necessity, strengths and caveats, *Physical Review E*, 68, 066202
- 66 citations **Andrzejak RG**, Mormann F, Kreuz T, Rieke C, Kraskov A, Elger CE, Lehnertz K (2003) Testing the null hypothesis of the non-existence of a pre-seizure state. *Physical Review E*, 67, 010901⁵
- 241 citations Mormann F, Kreuz T, **Andrzejak RG**, David P, Lehnertz K, Elger CE (2003) Epileptic seizures are preceded by a decrease in synchronization. *Epilepsy Research*, 53, 173-185⁶
- 135 citations Mormann F, **Andrzejak RG**, Kreuz T, Rieke C, David P, Elger CE, Lehnertz K (2003) Automated preictal state detection based on a decrease in synchronization in intracranial electroencephalography recordings from epilepsy patients. *Physical Review E*, 67, 021912
- 20 citations Rieke C, Mormann F, **Andrzejak RG**, Kreuz T, David P, Elger CE, Lehnertz K (2003) Discerning nonstationarity from nonlinearity in seizure-free and pre-seizure EEG recordings from epilepsy patients, *IEEE Transactions on Biomedical Engineering*, 50, 643-639

² This article was featured in the editorial commentary 'Brain rhythms in the human medial temporal lobe' by Heinze HJ. *Front. Neurosci.* 2,2:132-133.

³ This article is classified as highly cited article by the ISI Web of Science (as of 11/06/2017)

⁴ This is the most cited research article of all 293 research articles published in *Clinical Neurophysiology* in 2005.

⁵ Selected for publication in the 'Virtual Journal of Biological Physics Research', 5(2), January 2003

⁶ This is the most cited research article of all 113 research articles published in *Epilepsy Research* in 2003.

- 30 citations Rieke C, Sternickel K, **Andrzejak RG**, David P, Lehnertz K (2002) Measuring nonstationarity by analyzing the loss of recurrence in dynamical systems. *Physical Review Letters*, 88, 244102
- 89 citations **Andrzejak RG**, Widman G, Lehnertz K, Rieke C, David P, Elger CE (2001) The epileptic process as nonlinear deterministic dynamics in a stochastic environment- An evaluation on mesial temporal lobe epilepsy. *Epilepsy Research*, 44 (2-3) 129-140
- 616 citations **Andrzejak RG**, Lehnertz K, Rieke C, Mormann F, David P, Elger CE (2001) Indications of nonlinear deterministic and finite dimensional structures in time series of brain electrical activity: Dependence on recording region and brain state. *Physical Review E*, 64, 061907⁷

INVITED REVIEW ARTICLES (4)

[\(RESUME\)](#)

- 65 citations Lehnertz K, Mormann F, Kreuz T, **Andrzejak RG**, Rieke C, David P, Elger CE (2003) Seizure prediction by nonlinear EEG analysis, *IEEE Engineering in Medicine and Biology, Magazine*, 22, 57-63
- 109 citations Lehnertz K, **Andrzejak RG**, Arnhold J, Kreuz T, Mormann F, Rieke C, Widman G, Elger CE (2001) Nonlinear EEG analysis in epilepsy: Its possible use for interictal focus localization, seizure anticipation, and prevention. *Journal of Clinical Neurophysiology* 18, 209-222
- 39 citations Elger CE, Widman G, **Andrzejak R**, Arnhold J, David P, Lehnertz K (2000) Nonlinear EEG analysis and its potential role in epileptology. *Epilepsia*, 41, Suppl.3, S34-S38⁸
- 23 citations Lehnertz K, Widman G, **Andrzejak R**, Arnhold J, Elger CE (1999) Is it possible to anticipate seizure onset by non-linear analysis of intracerebral EEG in human partial epilepsies? *Revue Neurologique. (Paris)*, 155 (6-7) 454⁸

EDITORIALS (2)

[\(RESUME\)](#)

- 1 citations Mormann F **Andrzejak RG** (2016) Seizure Prediction: Making mileage on the long and winding road. (commentary). *Brain*, 139, 1625-1627
- 4 citations Faes L, **Andrzejak RG**, Ding M, and Kugiumtzis D (2012) Methodological Advances in Brain Connectivity, *Computational and Mathematical Methods in Medicine*. Vol. 2012, 492902

⁷ In the list of the top cited *Physical Review E* articles published in 2001, this article takes rank 5 among a total of 2315 research articles. This corresponds to a rank within the top 0.21 %. This article was selected for publication in the 'Virtual Journal of Biological Physics Research', 2(12), December 2001

⁸ For these early articles Prof. Andrzejak is listed in the ISI database as 'Andrzejak R' instead of 'Andrzejak RG'.

SCIENTIFIC PUBLICATIONS – DETAILS CONFERENCES ([TOP](#))

INVITED PLENARY CONFERENCE PRESENTATIONS ([RESUME](#))

- 05/17 10th International Conference on Chaotic Modeling and Simulation, CHAOS 2017
- 11/15 Galileo Galilei Institute for Theoretical Physics, 1st COSMOS school and workshop, Arcetri, Florence, Italy
- 05/14 135th EEG & Epilepsy Meeting, Department of Neurology, University of Bern, Bern, Switzerland
- 03/14 Neural Engineering Transformative Technologies Workshop, Marie Curie Initial training network, Istituto dei Sistemi Complessi, CNR, Florence, Italy
- 09/11 Fifth International Workshop on Seizure prediction, Dresden, Germany
- 06/11 First Annual Barcelona Computational and Systems Neuroscience Meeting. Institut d'Estudis Catalans, Barcelona, Spain
- 05/10 Epilepsy Symposium, L'Institut Municipal d'Investigació Mèdica, Hospital del Mar, Barcelona, Spain
- 05/10 458th WE-Heraeus-Seminar. Synchronization in Complex Networks: Theory and Applications in Neuroscience and Climatology, Bad Honnef, Germany
- 06/09 Fourth International Workshop on Seizure prediction, Kansas, USA
- 09/07 Third International Workshop on Seizure prediction, Freiburg, Germany

INVITED NON-PLENARY CONFERENCE PRESENTATIONS ([RESUME](#))

- 09/17 32nd International Epilepsy Congress, International League against Epilepsy, (ILAE) Barcelona, Spain
- 07/10 Meeting of the ‘Red Temática en Neurociencia Cognitiva (RNCC)’, Murcia, Spain.

CONFERENCE BOARD MEMBERSHIPS ([RESUME](#))

- 05/17 Scientific Advisor for the 10th International Conference on Chaotic Modeling and Simulation, CHAOS 2017, (May-June 2017, Barcelona, Spain)
- 11/15 Scientific board member for the 1st COSMOS school and workshop, (11/15, Arcetri, Florence, Italy)
- 09/11 Advisory committee member for the 5th International Workshop on Seizure Prediction (09/11, Dresden, Germany)
- 06/09 Advisory committee member for the 4th International Workshop on Seizure Prediction (06/09, Kansas City, Missouri, USA)

ORGANIZATION OF PEER-REVIEWED CONFERENCE SYMPOSIA ([RESUME](#))

- 06/17 Complex patterns on networks. XXXVII Dynamic Days Europe, Szeged, Hungary. (In cooperation with Totz JF and Martens E)
- 05/17 Characterizing spatio-temporal neuronal dynamics in epilepsy. 10th Chaos International Conference, Barcelona, Spain, May-June 2017
- 09/15 Time series, causality, networks and applications I & II. XXXV Dynamic Days Europe, Exeter, UK. (In cooperation with Kugiumtzis D)
- 09/14 Analysis, Modeling and Control of Electroencephalographic Recordings from Epilepsy Patients. XXXIV Dynamic Days Europe, Bayreuth, Germany. (In cooperation with Kugiumtzis D)

- 09/14 Multivariate Time Series, Causality and Networks. XXXIV Dynamic Days Europe, Bayreuth, Germany. (In cooperation with Kugiumtzis D)
- 06/13 Characterizing Neuronal Interactions and Synchronization in the Brain Dysfunction Epilepsy. XXXIII Dynamic Days Europe, Madrid, Spain.
- 09/12 Characterizing the spatial-temporal dynamics of the epileptic process by altered levels of neuronal synchronization. XXXII Dynamic Days Europe, Gothenburg, Sweden. (In cooperation with Lehnertz K)
- 09/12 Data-driven characterisation of directional interactions between dynamical systems. XXXII Dynamic Days Europe, Gothenburg, Sweden. (In cooperation with Lehnertz K)
- 06/09 Nonlinear Analysis of Time Series and Applications. 3rd International Conference on Complex Systems and Applications, Le Havre, France. (In cooperation with Kugiumtzis D)

CONTRIBUTED CONFERENCE PRESENTATIONS

[\(RESUME\)](#)

- T: Talk
P: Poster
B: Conference related book chapter
A: Peer-reviewed article in conference proceedings
- T Andrzejak RG, Ruzzen G, Santamaría NP, Malvestio I (2017) Driver response couplings between networks in chimera states. XXXVII Dynamic Days Europe, Szeged, Hungary, June 2017
- T Martínez CGB, Niediek J, Mormann F, Andrzejak RG (2017) The interplay of synchronization in epilepsy and sleep: A data-driven approach. XXXVII Dynamic Days Europe, Szeged, Hungary, June 2017
- T Ruzzen G, Andrzejak RG (2017). Control of chimera states via pacemakers. XXXVII Dynamic Days Europe, Szeged, Hungary, June 2017
- T Ruzzen G, Andrzejak RG (2017). Control of chimera states in networks of phase oscillators. 10th Chaos 2017 International Conference, Barcelona, Spain, May-June 2017
- T Malvestio I, Kreuz T, Andrzejak RG, (2017) Nonlinear interdependence detection from spike trains. XXII Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi, Parma, Italy, June 2017
- T Leguia MG, Laiou P, Levnajic Z, Andrzejak RG (2017) Network reconstruction via rank statistics measures. 10th Chaos 2017 International Conference, Barcelona, Spain, May-June 2017
- P Malvestio I, Kreuz T, Andrzejak RG (2017) Versatility of a nonlinear interdependence method for directional coupling detection between spike trains. 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Jeju Island, South Korea, July 2017
- P Malvestio I, Kreuz T, Mormann F, Andrzejak RG (2017) Using a non-linear interdependence approach to detect directional coupling from spike trains. Annual Meeting of the Society for Neuroscience, Washington DC, USA, November 2017
- P Leguia MG, Laiou P, Levnajic Z, Andrzejak RG (2017) Network inferring using rank-based connectivity measures. XXXVII Dynamic Days Europe, Szeged, Hungary, June 2017
- P Martínez CGB, Niediek J, Mormann F, Andrzejak RG (2017) The interplay between sleep and epilepsy from a synchronization point of view. Barcelona Computational, Cognitive and Systems Neuroscience (BARCCSYN), Barcelona, Spain, June 2017
- T Andrzejak RG, Rummel C, Mormann F, Schindler K (2016) Characterization and Control of Chimera State Collapses, International Symposium on Nonlinear Theory and its Applications, Yugawara, Japan, November 2016
- P Laiou P, Malvestio L, Andrzejak RG (2016) The asymmetric state similarity criterion: a versatile feature to detect directional couplings from signals. Conference on Advances in the collective behaviour of complex systems, Potsdam, Germany, September 2016

- P Malvestio I, Andrzejak RG (2016) Robustness to noise of a coupling detection method between spike trains. Barcelona Computational and Systems Neuroscience (BARCCSYN), Barcelona, Spain, June, 2016
- P Laiou P, Andrzejak RG (2016) Equivalent couplings in pairs of bidirectionally coupled asymmetric dynamics. 9th Conference of the European Study Group on Cardiovascular Oscillations (ESGCO), Lancaster, UK, April 2016.
- P Malvestio I, Andrzejak RG (2016) Detecting couplings between spike trains with noise. 9th Conference of the European Study Group on Cardiovascular Oscillations (ESGCO), Lancaster, UK, April 2016.
- T Andrzejak RG, Schindler K, Rummel C (2015) Tracing the temporal evolution of coherence in networks of nonlocally coupled oscillators. XXXV Dynamic Days Europe, Exeter, UK, September 2015
- T Rummel C, Abela E, Andrzejak RG, Wiest R, Schindler K (2015) Resected brain tissue, seizure onset zone and quantitative EEG measures: Towards prediction of post-surgical seizure control. XXXV Dynamic Days Europe, Exeter, UK, September 2015
- P Laiou P, Andrzejak RG (2015) Equality and equivalency in interdependence of non-identical bidirectionally coupled dynamics. XXXV Dynamic Days Europe, Exeter, UK, September 2015
- T Andrzejak RG (2014): A generalized approach to detect directional couplings from time-continuous flows, point processes and event-related data. XXXIV Dynamic Days Europe, Bayreuth, Germany, September 2014
- T Schindler K, Andrzejak RG (2014): Nonlinear structure index to identify the epileptogenic zone: a case report. 10th European Congress on Epileptology, Stockholm, Sweden, July 2014
- A Laiou P, Andrzejak RG, Kugiumtzis D (2014): Evaluation of causality measures based on non-uniform embedding schemes with application to the cardiovascular system. 8th Conference of the European Study Group on Cardiovascular Oscillations (ESGCO): 225-226, doi: 10.1109/ESGCO.2014.6847601
- P Laiou P, Andrzejak RG (2014) Detecting equivalent couplings in non-identical bidirectionally coupled dynamics from pairs of signals. XXXIV Dynamic Days Europe, Bayreuth, Germany, September 2014
- T Andrzejak RG (2013): Detecting directional couplings between spiking signals and time-continuous signals. 2nd Workshop on new approaches to spike train analysis and neuronal coding, held at Twenty-third Annual Computational Neuroscience Meeting CNS Paris, France, July 2013
- T Andrzejak RG, Schindler K, Rummel C (2013): Electroencephalographic signals from seizure-generating brain areas: less randomness, more nonlinear-dependence, and more stationarity. XXXIII Dynamic Days Europe, Madrid, Spain, June 2013
- T Andrzejak RG (2013): Detecting couplings between spiking signals and continuous signals. Barcelona Computational and Systems Neuroscience (BARCSYN), Barcelona, Spain, June 2013
- T Andrzejak RG, Kreuz T, Mormann F (2012): Detecting Couplings Between Point Processes and Flows, International Symposium on Nonlinear Theory and its Applications, Mallorca, Spain, October 2012
- T Andrzejak RG (2012): Epileptogenic zone identification: Extracting the Nonlinear Structure Index from seizure-free EEG recordings. 10th European Congress on Epileptology, London, United Kingdom, September 2012
- T Andrzejak RG (2012): The epileptic focus is associated with neuronal hyper-synchrony. Applying bivariate signal analysis to localize the epileptic focus. XXXII Dynamic Days Europe, Gothenburg, Sweden, September 2012
- T Andrzejak RG (2012): A generalized approach to characterize directional couplings between point processes and flows. XXXII Dynamic Days Europe, Gothenburg, Sweden, September 2012
- P Kreuz T, Chicharro D, Andrzejak RG, Mormann F (2012) Measuring real-time synchronization in neuronal spike trains. Sixth International Workshop on Statistical Analysis of Neuronal Data (SAND6) Pittsburgh, PA, USA, June 2012
- T Andrzejak RG, Chicharro D, Lehnertz K, Mormann F (2011): Using bivariate surrogates to lateralize the epileptic focus. 2011 Meeting of the Society of Applied Neurosciences. Thessaloniki, Greece, May 2011
- T Andrzejak RG (2011) Detecting directional couplings from spike trains. Workshop: New approaches to spike train analysis and neuronal coding, held at Twentieth Annual Computational Neuroscience Meeting CNS, Stockholm, Sweden, July, 2011

- B Andrzejak RG (2011): Nonlinear time series analysis in a nutshell. In: Osorio I, Zaveri H, Frei M, Arthurs S (eds.) *Epilepsy: The Intersection of Neurosciences, Biology, Mathematics, and Engineering*. CRC Press, Taylor & Francis Group, 125-138.
- B Andrzejak RG, Chicharro D, Mormann F (2011): Impact of biases in the false-positive rate on null hypothesis testing. In: Osorio I, Zaveri H, Frei M, Arthurs S (eds.) *Epilepsy: The Intersection of Neurosciences, Biology, Mathematics, and Engineering*. CRC Press, Taylor & Francis Group, 241-248
- B Mormann F, Andrzejak RG, Lehnertz K (2011): Seizure Time Series Analysis II: Automated Prediction and Assessment of Seizure Prediction Algorithms. In: Osorio I, Zaveri H, Frei M, Arthurs S (eds.) *Epilepsy: The Intersection of Neurosciences, Biology, Mathematics, and Engineering*. CRC Press, Taylor & Francis Group, 165-174
- T Chicharro D, Kreuz T, Andrzejak RG (2011): What spike train distances can tell us about the neural code. Workshop: New approaches to spike train analysis and neuronal coding, held at Twentieth Annual Computational Neuroscience Meeting CNS, Stockholm, Sweden, July, 2011
- P Chicharro D, Andrzejak RG, Ledberg A (2011): Inferring and quantifying causality in neuronal networks. Twentieth Annual Computational Neuroscience Meeting CNS, Stockholm, Sweden, July, 2011. *BMC Neuroscience* 2011, 12, Suppl 1, P192
- P Kreuz T, Chicharro D, Andrzejak RG (2011): Measuring real-time synchronization in both spike trains and continuous time series. Twentieth Annual Computational Neuroscience Meeting CNS, Stockholm, Sweden, July, 2011. *BMC Neuroscience* 2011, 12, Suppl 1, P3
- A Serrà J, de los Santos CA, Andrzejak RG (2011). Nonlinear audio recurrence analysis with application to genre classification. *Proc. of the IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP)*. Prague, Czech Republic, Issue date 22-27 May 2011, pages: 169 – 172. Digital Object Identifier: 10.1109/TASL.2011.2162321
- T Andrzejak RG, Polychronaki GE, Andreas Schulze-Bonhage A Nikita KS (2010). Multivariate synchronization analysis of simultaneous scalp and intracranial EEG recordings from epilepsy patients. 2010 International Symposium on Nonlinear Theory and its Applications, Krakow, Poland, September 2010
- P Chicharro D, Andrzejak RG. Evaluation and Interpretation of Causality in Complex Networks. 458th WE-Heraeus-Seminar on Synchronization in Complex Networks: Theory and Applications in Neuroscience and Climatology, Bad Honnef, Germany, May 2010
- P Polychronaki GE, Andrzejak RG, Andreas Schulze-Bonhage A Nikita KS (2010). Multivariate synchronization analysis of simultaneous scalp and intracranial EEG recordings from epilepsy patients. 458th WE-Heraeus-Seminar on Synchronization in Complex Networks: Theory and Applications in Neuroscience and Climatology, Bad Honnef, Germany, May 2010
- P Chicharro D, Kreuz T, Caporello E, Gentner TQ, Andrzejak RG (2010) Limitations of spike train distances to study the time-scales of natural sounds discrimination. 40th Annual Meeting of the Society for Neuroscience. Program number 578.8. San Diego, USA, November 2010
- P Kreuz T, Chicharro D, Andrzejak RG (2010) Time-resolved and time-scale adaptive measures of spike train synchrony. 40th Annual Meeting of the Society for Neuroscience. Program number 616.6 San Diego, USA, November 2010
- P Kreuz T, Chicharro D, Andrzejak RG (2010) Time-resolved and time-scale adaptive measures of spike train synchrony. Workshop on Spike Train Measures and Their Applications to Neural Coding. Plymouth, United Kingdom, June 2010
- P Chicharro D, Kreuz T, Andrzejak RG (2010) Limitations of time-scale parametric spike train distances to study precision and reliability. Workshop on Spike Train Measures and Their Applications to Neural Coding. Plymouth, United Kingdom, June 2010
- A Serrà J, Kantz H, Andrzejak RG (2010): Model-based cover song detection via threshold autoregressive forecasts. *Proc. of the ACM Multimedia, Workshop on Music and Machine Learning (MML)*, pp. 13-16. Florence, Italy. October 2010, Digital Object Identifier: 10.1145/1878003.1878008
- T Andrzejak RG, Chicharro D, Mormann F, Lehnertz K (2009): Localizing epileptic foci using surrogate-baseline corrected nonlinear synchronization measures. 3rd International Conference on Complex Systems and Applications, Le Havre, France, June 2009.
- T Andrzejak RG (2009) Testing null hypotheses about seizure prediction algorithms. 4th International Workshop on Epileptic Seizure Prediction, Kansas City, Missouri, USA, June 2009

- P Serrà J, Zanin M, Andrzejak RG (2009) Cover song retrieval by cross recurrence quantification and unsupervised set detection. Music Information Retrieval Evaluation eXchange (MIREX), Kobe, Japan. October, 2009⁹.
- P Chicharro D, Andrzejak RG, Kreuz T (2009): Studying the precision of temporal neural code: Some limitations of spike train distances. Eighteenth Annual Computational Neuroscience Meeting. BMC Neuroscience 10 (Suppl 1):P130. CNS Berlin, Germany, July 2009.¹⁰
- P Kreuz T, Chicharro D, Andrzejak RG (2009): Measuring spike train synchrony between neuronal populations. Eighteenth Annual Computational Neuroscience Meeting. BMC Neuroscience 10 (Suppl 1):P271. CNS Berlin, Germany, July 2009.
- T Andrzejak RG, Chicharro D, Ledberg A, (2008): A new measure for the detection of directional couplings based on rank statistics. International Symposium on Nonlinear Theory and its Applications. Budapest, Hungary, September 2008.
- T Andrzejak RG, Chicharro D, Ledberg A (2008): Characterization of time-dependent event-related directional couplings. Workshop: Network Synchronization: from dynamical systems to neuroscience. Leiden, Netherlands, May 2008
- P Chicharro D, Ledberg A, Andrzejak RG, (2008): A new measure for the detection of directional couplings based on rank statistics. Seventeenth Annual Computational Neuroscience Meeting, BMC Neuroscience 9 (Suppl 1): P148. CNS Portland, Oregon, USA, July 2008.¹¹
- P Kreuz T, Chicharro D, Andrzejak RG, Haas JS, Abarbanel HDI, Torcini A, Politi A (2008): Measuring spike train reliability. Seventeenth Annual Computational Neuroscience Meeting, BMC Neuroscience 9 (Suppl 1):P30. CNS Portland, Oregon, USA, July 2008
- P Kreuz T, Chicharro D, Andrzejak RG, Haas JS, Abarbanel HDI, Torcini A, Politi A (2008): Measuring multivariate spike train synchrony. X. International Conference on Cognitive Neuroscience, Bodrum, Turkey, September 2008
- P Kreuz T, Chicharro D, Andrzejak RG, Haas JS, Abarbanel HDI, Torcini A, Politi A (2008): Measuring spike train reliability. Workshop: Network Synchronization: from dynamical systems to neuroscience. Leiden, Netherlands, May 2008
- B Schelter B, Andrzejak RG, Mormann F (2008): Can your prediction algorithm beat a random predictor? In: Schelter B, Schulze-Bonhage A, Timmer J (eds.) Seizure Prediction in Epilepsy: From Basic Mechanisms to Clinical Applications. Wiley-VCH (2008)
- T Andrzejak RG, Mormann F (2007): Statistical validation of the performance of seizure prediction algorithms. 3rd International Workshop on Epileptic Seizure Prediction, Freiburg, Germany, September 2007
- T Andrzejak RG, Chicharro D, Ledberg A, Deco G (2007): Detection of time-dependent event-related directional couplings, Dynamic Days Europe, Loughborough, United Kingdom, July 2007
- P Andrzejak RG, Bicanski A (2007): Forming place cells from through feedforward input from grid cells – a computational model. Annual Meeting of the Society for Neuroscience. San Diego, USA, November 2007, Program number 753.1
- P Loh M, Andrzejak RG, Deco G (2007): Analysis of coupled decision-making modules for multisensory integration. Computational Neuroscience Meeting. Toronto, Canada, July 2007
- P Andrzejak RG, Ledberg A, Chicharro D, Deco G (2006): Characterization of event-related directional couplings Dynamic Days Europe, Crete, Greece, September 2006
- P Andrzejak RG, Ledberg A, Chicharro D, Deco D (2006): Detecting very short event-related directional couplings in neuronal dynamics. Annual Meeting of the Society for Neuroscience: Atlanta, USA. October 2006, Program number 102.6
- P Andrzejak RG, Ledberg A, Deco D (2005): Characterization of time varying directional couplings in neuronal dynamics. Annual Meeting of the Society for Neuroscience, Washington DC, USA, November 2005, Program 689.15

⁹ *The underlying algorithm won the 'Audio cover song identification task of the music information retrieval evaluation exchange contest'.*

¹⁰ *Awarded with a travel fellowship by the Organization for Computational Neurosciences (2009).*

¹¹ *Awarded with a travel fellowship by the Organization for Computational Neurosciences (2008).*

- P Loh M, Ledberg A, Andrzejak RG, Deco D (2005): External context input can account for changes in neural firing rate in prefrontal cortex during arbitrary visuomotor task. Annual Meeting of the Society for Neuroscience, Washington DC, USA, November 2005, Program 997.16
- P Osterhage H, Mormann F, Andrzejak RG, Elger CE, Lehnertz K (2005): Focus Lateralization in Temporal Lobe Epilepsy: Comparison of Different Synchronization Measures. *Epilepsia*, 46 (8), 320
- P Kreuz T, Andrzejak RG, Kraskov A, Mormann F, Lehnertz K, Grassberger P (2005): Measuring synchronization in coupled model systems: A comparison of different approaches. International Symposium on topical problems of nonlinear wave physics. Nizhny Novgorod, Russia. Book of abstracts, pp. 15-66
- T Mormann F, Osterhage H, Mormann F, Andrzejak RG, Elger CE, Lehnertz K (2005): Focus Localization in Temporal Lobe Epilepsy: Measuring Focal Driving in the EEG. *Epilepsia*, 46 (8), 268¹²
- A Stögbauer H, Andrzejak RG, Kraskov A, Grassberger P (2004): Reliability of ICA estimates with mutual information. *Lecture Notes in Computer Science*. 3195: 209-216
- B Andrzejak R, Kreuz T, Mormann F, Lehnertz K, Elger CE (2004): Surrogate time series improve the capability of nonlinear measures to characterize the epileptic process In Klonowski (Ed.) *Simplicity behind complexity*. Pabst Science Publishers, 360-366
- T Andrzejak RG, Kreuz T., Mormann M., Widman G., Elger CE, Lehnertz, K (2004): Surrogate Corrected Nonlinear Measures Allow Improved Focus Localization From Intracranial EEG Recordings In Epilepsy Patients. *Dynamic Days Europe*, Mallorca, Spain, September 2004
- P Andrzejak RG und Smirnov D.A. (2004): Detection of weak directional coupling: phases, state space, or both? *Dynamic Days Europe*, Mallorca, Spain, September 2004
- P Andrzejak RG, Mormann F, Kreuz T, Widman G, Elger CE, Lehnertz K (2004): Nonlinearity: the key to a successful characterization of the spatial distribution of the epileptic process. *Epilepsia* 45 (7), 66
- T Mormann F, Kraskov A, Kreuz T, Andrzejak RG, Osterhage H, Elger CE, Lehnertz K (2004): Seizure prediction: Influence of EEG band-pass filtering on the predictive performance of synchronization measures. *Epilepsia* 45 (7), 62-63
- P Osterhage H, Mormann F, Andrzejak RG, Elger CE, Lehnertz K (2004): Spatial synchronization maps from intracranial EEG recordings allow differentiation of anatomically and functionally distinct brain structures. *Epilepsia* 45 (7), 245-246
- T Smirnov DA, Andrzejak RG (2004): Revealing weak directional coupling from time series: phase dynamics modeling and state space analysis. *Proceedings of VII International School "Chaotic oscillations and pattern formation" (CHAOS-2004)*, Saratov, Russia, 2004, p. 93-94 (in Russian).
- P Kreuz T, Mormann F, Kraskov A, Andrzejak RG, Grassberger P, Elger CE, Lehnertz K (2004): Measuring synchronization and directionality in EEG time series from epilepsy patients: An application to seizure prediction. *Epilepsia* 45 (7), 243
- T Smirnov, D.A., Andrzejak RG and Kraskov A (2004): Learning driver-response relationships from time series. Comparative study of nonlinear dynamics methods, *Proceedings of the XII scientific school nonlinear waves Feb-Mar 2004, conference of young scientists, Nizhny Novgorod (Russia)*, 105-106. (in Russian)
- T Andrzejak RG, Kreuz T, Mormann F, Kraskov A, Rieke C, Elger CE, Lehnertz K (2003): Put your seizure-prediction statistics to the test: the method of seizure time surrogates. *Epilepsia* 44 (Suppl. 9): 172¹³
- T Andrzejak RG, Kraskov A, Kreuz T, Stoegbauer H, Mormann F, Lehnertz K, Grassberger P (2003): Discriminating linear correlation and nonlinear interdependence by means of bivariate surrogate techniques. *SIAM Conference on Applications of Dynamical Systems*, Snowbird, USA
- T Andrzejak RG, Kraskov A, Kreuz T, Stögbauer H, Mormann F, Lehnertz K, Grassberger P (2003): International Symposium on topical problems of nonlinear wave physics. On the use of bivariate surrogate techniques in combination with nonlinear interdependence measures. Nizhny Novgorod, Russia. Book of abstracts, pp. 123-124

¹² Awarded with Young Investigator Award of the American Epilepsy Society 2005.

¹³ Awarded with Young Investigator Travel Award of the American Epilepsy Society 2003.

- T Stögbauer H, Kraskov A, Kreuz T, Andrzejak RG, Grassberger P (2003): Multivariate analysis: Characterization of physiological state from intracranial EEG recordings. International Symposium on topical problems of nonlinear wave physics. Nizhny Novgorod, Russia. Book of abstracts, pp. 119-120
- T Mormann F, Kreuz T, Andrzejak RG, Rieke C, Kraskov A, Elger CE, Lehnertz K (2003): On the predictability of seizures. *Epilepsia* 44 (Suppl. 9): 172
- T Mormann F, Kreuz T, Rieke C, Andrzejak RG, Kraskov A, David P, Elger CE, Lehnertz K (2003): Epilepsy: Does a pre-seizure state really exist? International Symposium on topical problems of nonlinear wave physics. Nizhny Novgorod, Russia. Book of abstracts, pp. 32-33
- P Kreuz T, Andrzejak RG, Kraskov A, Mormann F, Stögbauer H, Elger CE, Grassberger P, Lehnertz K (2003): Validating the performance of epileptic seizure prediction algorithms using simulated annealing. International Symposium on topical problems of nonlinear wave physics. Nizhny Novgorod, Russia. Book of abstracts, pp. 95-96
- P Kreuz T, Andrzejak RG, Kraskov A, Mormann F, Stögbauer H, Grassberger P, Elger CE, Lehnertz K (2003): Time profile surrogates: a new method to validate the performance of epileptic seizure prediction algorithms. *Epilepsia* 44 (Suppl. 9): 231
- P Kraskov A, Stögbauer H, Kreuz T, Andrzejak RG, Grassberger P (2003): New methods of calculating mutual information. International Symposium on topical problems of nonlinear wave physics. Nizhny Novgorod, Russia. Book of abstracts, pp. 131-132
- B Elger CE, Mormann F, Kreuz T, Andrzejak RG, Rieke C, Sowa R, Florin S, David P, Lehnertz K (2002): Characterizing the spatio-temporal dynamics of the epileptogenic process with nonlinear EEG analysis. In: R. Tetzlaff (Ed.) Proceedings of the 7th IEEE International Workshop on Cellular Neural Networks and Their Applications. World Scientific, Singapore, 228-242 (2002)
- B Lehnertz K, Andrzejak RG, Kreuz T, Mormann F, Rieke C, David P, Elger CE (2002): Analysis of EEG data in epilepsy. In: Nardulli G, Stramaglia S (Eds.) Modelling biomedical signals. World Scientific, Singapore (2002), 17-27.
- T Andrzejak RG, Kraskov A, Kreuz T, Mormann F, Grassberger P (2002): A comparison of the performance of different synchronization measures in combination with the method of bivariate surrogates. Synchronization meeting in Saratov, Russia, Book of abstracts
- T Andrzejak R, Kreuz T, Mormann F, Lehnertz K and Elger CE (2004): Surrogate time series improve the capability of nonlinear measures to characterize the epileptic process. 3rd European Interdisciplinary School on Nonlinear Dynamics for System and Signal Analysis – EUROATTRACTOR 2002¹⁴
- T Mormann F, Kreuz T, Andrzejak RG, Rieke C, Kraskov A, David P, Elger CE, Lehnertz K (2002): Preictal state detection in continuous intracranial EEG recordings based on decreased phase synchronization: problems and pitfalls. *Epilepsia* 43 (7) 121¹⁵
- P Andrzejak RG, Rieke C, Mormann F, Kreuz T, David P, Elger CE, Lehnertz K (2002): On the influence of nonstationarity of the EEG on the capability of nonlinear surrogate measures to characterize the spatial distribution of the epileptogenic process. *Epilepsia* 43 (Suppl. 7) 43
- P Kreuz T, Kraskov A, Andrzejak RG, Mormann F, Rieke C, Grassberger P, Elger CE, Lehnertz K (2002): Seizure prediction: Quantifying the performance of measures in distinguishing pre-ictal from inter-ictal states. *Epilepsia* 43 (7) 48
- P Kraskov A, Kreuz T, Quiñero R, Grassberger P, Mormann F, Andrzejak RG, Elger CE, Lehnertz K (2002): Comparison of two phase synchronization analyses techniques for interictal focus lateralization in mesial temporal lobe epilepsy. *Epilepsia* 43 (7) 48
- P Rieke C, Andrzejak RG, Mormann F, Kreuz T, David P, Elger CE, Lehnertz K (2002): The influence of nonstationarity and segmentation size on the analysis of intracranial EEG recordings. *Epilepsia* 43 (7) 49
- P Stögbauer H, Yang L, Grassberger P, Andrzejak RG, Kreuz T, Kraskov A, Elger CE, Lehnertz K (2002): Lateralization of the focal hemisphere in mesial temporal lobe epilepsy using independent component analysis. *Epilepsia* 43 (7) 51

¹⁴ Awarded as the best oral presentation of this meeting

¹⁵ Awarded with the Young Investigator Travel Award of the American Epilepsy Society 2002

- T Andrzejak RG, Lehnertz K, Rocamora R, Mormann F, David P, Elger CE (2001): Focus localization using the fraction of nonlinear determinism: influence of sleep depth. *Epilepsia* 42 (2) 176
- T Andrzejak RG, Lehnertz K, Rieke C, Mormann F, Kreuz T, David P, Elger CE (2001): Focus lateralization in mesial temporal lobe epilepsy: A comparison of linear and nonlinear measures. *Epilepsia* 42 (7) 98.
- T Mormann F, Lehnertz K, Andrzejak RG, David P, Elger CE (2001) Spatial shifts in phase synchronization in intracranial EEG recordings from epilepsy patients prior to seizures. *Epilepsia* 42 (2) 105¹⁶
- P Rieke C, Lehnertz K, Andrzejak RG, Mormann F, Kreuz T, David P, Elger CE. Characterizing nonstationarities in the EEG of epilepsy patients. *Epilepsia* 42 (7) 40
- P Kreuz T, Kraskov A, Quian Quiroga R, Grassberger P, Andrzejak RG, Mormann F, Rieke C, Lehnertz K, Elger CE. The capability of different interdependence measures to predict epileptic seizures. *Epilepsia* 42 (7) 39
- P Kreuz T, Quian Quiroga R, Grassberger P, Lehnertz K, Elger CE (2001): Interdependencies in intracranial EEG recordings of epilepsy patients: A comparison of different measures. *Epilepsia* 42 (2) 49
- P Mormann F, Lehnertz K, Andrzejak RG, Kreuz T, Rieke C, David P, Elger CE (2001): Preictal state detection in intracranial EEG recordings from epilepsy patients using the linear cross correlation function. *Epilepsia* 42 (7) 39
- B Andrzejak RG, Widman G, David P, Lehnertz K, Elger CE (2000): Nonlinear deterministic dynamics in seizure free EEG epochs as an indicator of the epileptogenic process. A comparison of three surrogate methods. In Lehnertz K, Arnhold J, Grassberger P, and Elger CE (Eds.) *Chaos in Brain?* World Scientific, Singapore, 340-343
- B Lehnertz K, Andrzejak RG, Arnhold J, Widman G, W Burr, David P, Elger CE (2000): Possible clinical and research applications of nonlinear EEG analysis in humans. In Lehnertz K, Arnhold J, Grassberger P, and Elger CE (Eds.) *Chaos in Brain?* World Scientific, Singapore, 134-155
- B Elger CE, Widman G, Andrzejak R, Dimpelmann M, Arnhold J, Grassberger P, Lehnertz K (2000), Value of nonlinear time series analysis of the EEG in neocortical epilepsies. Book series: *Advances in neurology*, 84, 317-330
- T Mormann F, Lehnertz K, Andrzejak RG, Elger CE (2000). Characterizing preictal states by changes in phase synchronization in intracranial EEG recordings from epilepsy patients. *Epilepsia* 41 (7) 167
- P Andrzejak RG, Lehnertz K, Mormann F, David P, Elger CE (2000): Does the fraction of nonlinear determinism in the EEG increase prior to seizures? *Epilepsia* 41 (7) 202
- P Lehnertz K, Andrzejak RG, Mormann F, Kreuz T, David P, Elger CE (2000): Forecasting epileptic seizures: adequacy of different EEG analysis techniques. *Epilepsia* 41 (7) 212
- P Rieke C, Lehnertz K, Andrzejak RG, David P, Elger CE (2000): Nonlinearity or nonstationarity in the EEG of epilepsy patients? *Epilepsia* 41 (7), 208
- P Schmadel S, Mormann F, Andrzejak RG, Lehnertz K, Ebert U (2000): Amygdala kindling induces changes of EEG complexity and synchronization in rats. *Epilepsia* 41 (7) 17
- P Andrzejak RG, Widman G, Lehnertz K, David P, Elger CE (1999): Nonlinear determinism in intracranial EEG recordings allows focus localization in neocortical lesional epilepsy. *Epilepsia* 40 (7) 171-172
- P Widman G, Andrzejak RG, Mormann F, Wegener J, Widman, David P, Lehnertz K, Elger CE (1999): Designing a seizure prediction system: problems and pitfalls. *Epilepsia* 40 (2) 16
- P Lehnertz K, Andrzejak RG, Mormann F, Wegener J, Widman G, David P, Elger CE (1999): Linear and nonlinear EEG analysis techniques for anticipating epileptic seizures. *Epilepsia* 40 (2) 71
- P Andrzejak RG, Widman G, Lehnertz K, David P, Elger CE (1998): Fraction of nonlinear determinism in intracranial EEG recordings allows focus lateralization in mesial temporal lobe epilepsy. *Epilepsia* 39 (6) 206

¹⁶ Awarded with a Travel Fellowship of the American Clinical Neurophysiology Society 2001

INVITED SCIENTIFIC SEMINARS AND TUTORIALS[\(RESUME\)](#)

- 03/17 Fifth Bern Network of Epilepsy Sleep and Consciousness Lecture Series,
Department of Neurology, University of Bern, Switzerland
- 03/16 Fourth Bern Network of Epilepsy Sleep and Consciousness Lecture Series,
Department of Neurology, University of Bern, Switzerland
- 10/15 Academic Coordination Unit of the Information and Communication Technology
Engineering degrees. Universitat Pompeu Fabra, Barcelona, Spain ([available
online here](#))
- 02/15 Institute for Bioengineering of Catalonia (IBEC), Barcelona, Spain
- 05/13 Department of Epileptology, University Bonn, Germany
- 04/13 Centre for Genomic Regulation, Parc de Recerca Biomèdica de Barcelona, Spain
- 07/12 Brain Mapping and Functional Connectivity, Focus Group Meeting Barcelona,
L'Institut Municipal d'Investigació Mèdica, Hospital del Mar, Barcelona, Spain
- 06/12 Department of Neurology, University of Bern, Bern, Switzerland
- 03/12 Department of Epileptology, University Bonn, Germany
- 12/09 L'Institut Municipal d'Investigació Mèdica, Hospital del Mar, Barcelona, Spain
- 05/09 Department of Mathematical, Physical and Computational Sciences
Aristotle University of Thessaloniki, Greece
- 02/09 California Institute of Technology, Pasadena, USA
- 03/08 Marie Curie European School in Neurosciences, Aquila, Italy
- 03/07 Department of Psychiatry and Clinical Psychobiology, University of Barcelona,
Spain
- 03/07 Department of Applied Physics, Universitat Politècnica de Catalunya, Barcelona,
Spain
- 02/06 Karolinska Institute, Stockholm, Sweden
- 02/06 Istituto Superiore de Sanità, Rome, Italy
- 01/05 Karolinska Institute, Stockholm, Sweden
- 05/04 Institute for Cognition and Information, Nijmegen, Netherlands
- 02/04 Department of Technology, Universitat Pompeu Fabra, Barcelona, Spain
- 09/03 Dpto. Neurobiología-Investigación. Hospital Ramón y Cajal, Madrid, Spain
- 07/03 Neurochirurgische Universitäts Klinik, Sektion Prächirurgische Diagnostik,
Freiburg, Germany
- 06/03 Krasnow Institute for Advanced Studies, George Mason University, Fairfax, USA
- 12/02 Sloan-Swartz Center for Theoretical Neurobiology, California Institute of
Technology, Pasadena, USA
- 10/01 Special Centre for Epilepsy in the Netherlands, 'Meer en Bosch', Heemstede,
Netherlands
- 05/01 University Hospital Zürich, Neurological Clinic, Zürich, Switzerland