

Résumé

Nelson Martins

(September 15th 2013)

EDUCATION

B.Sc. (1972), Electrical Engineering, University of Brasilia, Brazil

M.Sc. (1974), Ph.D. (1978), Electric Power Systems Engineering, University of Manchester, UK.

SUMMARY

- Dr Martins has worked in the field of small-signal dynamic analysis and control of large electric power systems for 35 years.
- His entire career has been with CEPEL — Centro de Pesquisas de Energia Elétrica — the Brazilian Electric Energy Research Center located in Rio de Janeiro. This is one of the world's major electric power research centers, employing hundreds of highly qualified researchers.
- He has conducted and managed a very large number of research projects at CEPEL. Throughout this time, he has served as an advisor and consultant to CEPEL on its research directions and specific projects.
- He has about 200 related technical publications, 45 of them in top international journals.
- He has been extremely active at the professional power systems engineering level. He has been an invited lecturer, panelist, chairman, convener and participating member in many international conferences, courses, symposia, committees, task forces and working groups.
- The vast majority of his professional service has been associated with CIGRE and the IEEE. He has continuously promoted joint CIGRE-IEEE liaison.
- He has made contributions to the field of numerical linear algebra, more specifically in sparse eigensolution and model order reduction algorithms, and his papers and algorithms have been cited by research groups led by top mathematicians.

PROFESSIONAL RECOGNITION

- 1998 – Elected as Fellow of the IEEE, “For fundamental developments in eigensolution algorithms and small stability analysis for the control of large scale power systems”.
- 2001 – Received the IEEE PES Technical Committee Working Group Recognition Award, as Chair of the Small Signal Stability Focus Group, Power System Dynamic Performance Committee.
- 2002 – Received the award "Distinguished Member of CIGRE".
- 2004 – Received the CEPEL 30th Anniversary Researcher Award.
- 2007 – Received the 2007 CIGRE Technical Committee Award for outstanding contributions to the work of the Study Committee C4 “System Technical Performance”.
- 2008 - IEEE PES Recognition Award for Distinguished Leadership as Power System Stability Controls Sub-Committee Chair.
- 2009 - IEEE PES Recognition Award for Outstanding Technical Report - Working Group on Blackout Experience, Mitigation and Role of New Technologies.
- 2009 – IEEE PES Technical Committee Working Group Recognition Award to “IEEE Task Force on Blackout Experience, Mitigation and Role of new Technologies”, as taskforce member, Power System Dynamic Performance Committee.
- 2010 - Presidential Award for Scientific Merit (Ordem Nacional do Mérito Científico), Brazilian Ministry for Science and Technology.
- 2010 - IEEE PES Distinguished Service Award, Power System Dynamic Performance Committee.
- 2012 - CREA-RJ "Oscar Niemeyer Award" for Best MSc Dissertation at the Military Institute of Engineering (IME), category Research Supervisor (in association with Colonel Dr. Paulo Cesar Pellanda, IME). Dissertation title: “A Frequency Response Test to Determine PSS Effectiveness at Multigenerator Power Plants”; Graduate student: Thiago Sanchez Bossa.
- 2013 - IEEE PES Technical Committee Prize Paper Award, presented to Joost Rommes, Nelson Martins and Francisco Damasceno Freitas, the authors of "Computing Rightmost Eigenvalues for Small-Signal Stability Assessment of Large Scale Power Systems", IEEE Transactions on Power Systems, Vol. 25, No. 2, May 2010, pages 929-938.

EMPLOYMENT HISTORY

1978-2000	Engineer, Group Manager, Project Manager, CEPEL
2001-2003	Technical Director of CEPEL
2004-	Assistant to the CEPEL Director General, Research Consultant to CEPEL

RESEARCH ACTIVITIES

- In 1979 he initiated CEPEL's R&D on small-signal power-system stability analysis and control, a research area that he has continued to lead since then.
- Over this extended period of research, he and colleagues developed ground-breaking algorithms that were incorporated into a major software application PacDyn, owned by CEPEL. This application analyzes the tendencies of a large electric power system to oscillate and collapse into blackout (an ever-present danger in places like Brazil, Europe, China and North America) and points to the most cost-effective oscillation damping control solutions.
- Today, PacDyn is one of the world's three leading software packages in this field, being used in 10 countries.
- Statnett, the Norwegian Transmission Operator, has recently started collaboration with CEPEL, for the development of online Small Signal Stability Assessment and Modal Estimation, for use in the modern control centers of the Nordic Interconnection, in which the small signal stability functions will be performed by the PacDyn software.
- He and colleagues laid the foundations for the application of efficient eigenvalue methods to the analysis of higher frequency electrical and electromagnetic phenomena such as subsynchronous resonance, power system harmonics and transmission line transients. Rather than using the state space formulation, they further developed the more general descriptor system and s-domain modeling approach, more suitable to the analysis in hand. He has presented his contributions to numerical linear algebra (NLA) experts in workshops and seminars held in Brazil, USA, England and Holland, and has been quite well cited by the NLA community.
- He and colleagues proposed methods and algorithms that helped the development of the HarmZs software package, developed by CEPEL for the analysis of harmonic distortion in power systems. This software is much used in Brazil by utilities as well as consulting companies. He is still jointly developing much research work in this area, related to advanced modal analysis, new eigenvalue algorithms and model order reduction.
- He and colleagues developed power flow and optimal power flow methods, which are reported in 6 papers published in the IEEE Transactions on Power Systems (1999, 2000, 2008, 2009, 2012 and 2013). Several of his proposals, regarding component modeling and new functions (continuation power flow, automatic determination of conflict among power flow controls, etc) were implemented in the power flow software ANAREDE, developed by CEPEL and used by hundreds of companies in the Brazilian electricity industry.
- He and colleagues developed new eigenvalue algorithms for large, sparse system models that led to 9 journal papers, published in 2006 – 2010 that appeared in Trans. on PWRs, SIAM (Society for Industrial and Applied Mathematics) and Linear Algebra and its Applications. These papers have been highly cited by both the engineering and numerical linear algebra communities worldwide.

- He and colleagues designed innovative generator field tests that are particularly effective for multigenerator power plants. A sequence of field tests were conducted at the 14,000 MW Itaipu hydroelectric plant, involving simultaneous measurements at two generating units, this being reported in a 2011 Transactions of Power Systems paper. Recent advances to the methodology led to improved results that will be described in another journal paper yet to be submitted.
- He and colleagues revisited power system stabilizer tuning practice and recently proposed a fully automated and robust implementation of the classical GEP tuning method (see 2013 Main Publications).
- He was one of the consultants on the development of ANATEM, the transient and dynamic stability simulator of CEPEL, in use by most Brazilian utilities, generation, and transmission agents. Also, the Brazilian system operator and the expansion planning agency utilize the software CEPEL on a routine basis. He helped develop models for line-commutated FACTS devices, HVDC links, HVDC CCC back-to-back stations, Power Oscillation Damping controllers and power system stabilizers.

RESEARCH INTERESTS

In the area of Power Systems:

- Power System Dynamic Performance.
- Power System Restoration.
- Small Signal Stability Analysis and Control.
- Large Scale Dynamic Models.
- Revisiting the Power System Stabilizer (PSS) Practice.
- Application of FACTS devices and HVDC transmission.
- Advanced Power Oscillation Damping (POD) Controllers.
- Coordinated Tuning of PSS and POD Controllers.
- Modal Identification from System Ambient Data and Ringdown.
- Power Plant Field Tests.
- Hierarchical Voltage Control.
- Voltage Security Analysis.
- Power System Harmonics.
- Power System Equivalents and Network Synthesis.
- Subsynchronous Resonance Phenomena.
- Power Flow Techniques and Controls.
- Optimal Power Flow Applications.
- Decentralized Control.

In the area of Numerical Linear Algebra (NLA):

- Descriptor Systems and Infinite Systems.
- Sparse Eigenvalue Methods.
- Model Order Reduction.
- Hopf Bifurcations.
- Efficient Linear Control Systems Algorithms.
- Exploiting the Cinergy between Control Systems and NLA.

PARTICIPATION IN IEEE/PES PANEL SESSIONS

(The full list of co-authors for the various papers and presentations is provided along the various sections "Publications by Year" of this Resumé)

1. Panel on "Power System Dynamic Restoration Issues", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "The Impact of FACTS Technologies on Power System Restoration Dynamics", IEEE/PES General Meeting, Minneapolis, July 25-29, 2010.
2. Panel on "System Wide Power System Model Validation", organized by Power System Dynamic Performance Committee. Title of presentation and paper: "System Wide Model Validation of the Brazilian Interconnected Power System", IEEE/PES General Meeting, Minneapolis, July 25-29, 2010.
3. Panel on "Power System Restoration Dynamics", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Redispatch to Reduce Rotor Shaft Impacts upon Transmission Loop Closure", IEEE/PES General Meeting, Pittsburgh, July 20-24, 2008.
4. Panel on "Recent Applications of Linear Analysis Techniques", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Coordinated Stabilizer Tuning in Large Power Systems Considering Multiple Operating Conditions", IEEE/PES General Meeting, Tampa, June 2007.
5. Panel on "Advanced Stability Controls", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Robust Signals for the TCSC Oscillation Damping Controllers of the Brazilian North-South Interconnection Considering Multiple Power Flow Scenarios and External Disturbances", IEEE/PES General Meeting, Tampa, June 2007.
6. Panel on "Recent Applications of Linear Analysis Techniques", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Utilizing Transfer Function Modal Equivalents for the Design of Power Oscillation Damping Controllers in Large Power Systems", IEEE/PES General Meeting, San Francisco, June 2005.
7. Panel on "Dynamic Modeling of Power System Loads for Stability", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Impact of Induction Motor Loads in System Loadability Margins and Damping of Inter-Area Modes". IEEE/PES General Meeting, Toronto, Canada, June 2003.
8. Panel on "Recent Applications of Linear Analysis Techniques", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Some Recent Developments in Small-Signal Stability and Control". IEEE/PES Winter Meeting, New York, January 2002.
9. Panel on "Recent Experience with Emergency Stability Controls", organized by Power System Dynamic Performance Committee. Title of Presentation and paper: "Brazilian Defense Plan Against Extreme Contingencies". IEEE/PES Summer Meeting, Vancouver, Canada, July 2001.

10. Panel on "Advanced (High-Side) Secondary Voltage Control of Power Plants", organized by Power System Dynamic Performance Committee. Title of presentation and paper "The New CIGRÉ Task Force on Coordinated Voltage Control in Transmission Networks", IEEE/PES Summer Meeting, Seattle, July 2000.
11. Panel on "FACTS Applications for Increased Utilization of Power Systems", organized by Power System Dynamic Performance Committee. Title of presentation and paper: "Using a TCSC for Line Power Scheduling and System Oscillation Damping-Small Signal and Transient Stability Studies", IEEE/PES Winter Meeting, Singapore, January 2000.
12. Panel on "System Reliability as Affected by Power System Stabilizers", organized by Power System Dynamic Performance Committee. Title of presentation and paper: "Retuning Stabilizers for the North-South Brazilian Interconnection", IEEE/PES Summer Meeting, Edmonton, Canada, July 1999.
13. Panel on "Utility Plans and Experience with Measurements of Power System Dynamics", organized by Power System Dynamic Performance Committee. Title of presentation: "System Oscillation Monitors: Field Results for the Argentinean Interconnected System", IEEE/PES Summer Meeting, Vancouver, Canada, July 1998.
14. Panel on "Recent Applications of Linear Analysis Techniques", organized by Power System Dynamic Performance Committee. Title of presentation: "Modal Analysis of Power System Networks for Electromagnetic Transient Studies" IEEE/PES Summer Meeting, Vancouver, Canada, July 1998.
15. Panel on "Coordination of Multiple High Speed Stability Controls", organized by IEEE/PES Working Group on Special Stability Controls, IEEE/PES Summer Meeting, Denver, Colorado, July 1996.
16. Panel on "New Horizons in Power System Stability", organized by IEEE/PES Special Stability Controls Working Group, IEEE/PES Winter Meeting, New York, January 1994.
17. Panel on "New Horizons in Power System Stability", organized by IEEE/PES Special Stability Controls Working Group, IEEE/PES Summer Meeting, July 1993.
18. Symposium on "Inter-Area Oscillations in Power Systems", organized by IEEE/PES System Oscillations Working Group, IEEE/PES Summer Meeting, San Diego, CA, July 1991.
19. Symposium on "Inter-Area Oscillations in Power Systems", organized by IEEE/PES System Oscillations Working Group, IEEE/PES Summer Meeting, New York, January 1991.
20. Symposium on "Eigenanalysis and Frequency Domain Methods for System Dynamic Performance", organized by IEEE/PES Working Group on Special Stability Controls. Title of presentation and paper: "Eigenvalue and Frequency Domain Analysis of Small-Signal Electromechanical Stability Problems", IEEE/PES Summer Meeting, July 1989.
21. Symposium on "Eigenanalysis and Frequency Domain Methods for System Dynamic Performance", organized by IEEE/PES Working Group on Special Stability Controls. Title of presentation and paper "Eigenvalue and Frequency Domain Analysis of Small-Signal Electromechanical Stability

Problems", IEEE/PES Winter Meeting, New York, January 1989.

INVITED SPEAKER to other PANEL SESSIONS, WORKSHOPS and SEMINARS:

1. CEPEL Workshop on "Eigenvalue Computation and other Numerical Linear Algebra Problems". Title of Presentation: "Model Order Reduction via Dominant Poles", CEPEL, Rio de Janeiro, December 5, 2011.
2. First Latin-American Workshop on the "Operation of Electrical Energy Systems under Emergency Conditions", Module of "New Technologies Applied to Electric Power Systems". Title of Presentation: "Experience with System Emergencies in USA and France and Recommendation for Improving the Reliability of the Interconnected Brazilian System". Event sponsored by CIER and IEEE, Cuernavaca, Morelos, Mexico, August 2009.
3. Workshop on "Nonlinear Eigenvalue Problems". Title of Presentation: "Descriptor and Nonlinear Eigenvalue Problems in the Analysis of Large Electrical Power Systems", University of Manchester, Manchester, UK, March 2007.
4. NERSC's Scientific Computing Seminars. Title of Presentation: "Eigenvalue Applications/Computation in Electrical Power Systems", Lawrence Berkeley National Labs, Berkeley, CA, June 2005.
5. Panel on FACTS applications. Title of Presentation: "FACTS Modeling and Control Issues", at the T&D Conference Latin America, São Paulo, November 2004.
6. Invited lecture at the First Regional Encounter of Computational and Applied Mathematics, Brazilian Society of Computational and Applied Mathematics. Title of Presentation: "Numerical Linear Algebra Challenges in the Solution of Dynamic Problems for Large Power System Models". Federal University of Santa Catarina, Florianópolis, Brazil, May 2003.
7. Panel on "Which Mathematics is needed by those using Mathematics". Title of Presentation: "The Testimony of a Research Scientist from CEPEL", at the "International Colloquium on the History and Teaching of Mathematics", Rio de Janeiro State University, Rio de Janeiro, March 2004.
8. IEEE/PES Distinguished Lecture: "Results in Modal Analysis and Control Techniques Applied to Power Systems", at the Minas Gerais Power Chapter, IEEE Region 9, November 18, 2003.
9. EPRI/NSF Workshop on "Global Dynamic Optimization of the Electric Power Grid". Title of Presentation: "Impact of the Interaction Among Controls", Playacar, Mexico, April 2002.
10. EPRI/NSF Workshop on "Urgent Opportunities for Transmission System Enhancement". Title of Presentation: "Research Results in Transmission Line s-Domain Models, Power System Harmonics, Electromagnetic Transients, Switching Overvoltage Suppressing Devices and FACTS Controls", Palo Alto, California, October 2001.
11. Panel Session PB3, in EPRI/Rio Conference. Title of Presentation: "Tools for System Security and Reliability", Rio de Janeiro, November 2001.

12. Invited presentation at "Seminar on Future Directions for Power Systems". Title of Presentation: "Advanced Analysis and Control Tools", University of Sydney, Australia, October 1999.
13. Invited Seminar on "Short-Term Measures to Minimize the Impact of Extreme Contingencies in the Brazilian Power System", Waseda University, Tokyo, Japan, 2000.
14. Panel on "System Aspects of New Controllable Components", Stockholm Power Tech, Stockholm, Sweden, June 1995.
15. Voltage Stability and Voltage Collapse Seminar. Title of Presentation: "Modal Analysis Applied to Voltage Stability", Sydkraft AB, Malmo, Sweden, June 1995.
16. Panel on "Long Term Dynamics and Voltage Stability", IV Symposium of Specialists in Electric Operations and Expansion Planning (IV SEPOPE), Iguassu Falls, Brazil, May 1994.
17. Panel on "Power System Simulation: Trends and Challenges for the Next Decade", IERE Workshop on "New Issues in Power System Simulation", Caen, France, March 1992.
18. EPRI/NSF Workshop on "Application of Advanced Mathematics to Power Systems". Title of Presentation: "Some Present and Future Activities in CEPEL's Power System Dynamics Area", Redwood City, California, September 1991.

PROFESSIONAL ACTIVITIES

General

- Member of the Brazilian Ministry for Energy Working Group GCE-103 "The January 21, 2002 Blackout: Analysis of its Causes and Means for Reducing the Impact of Future Disturbances", whose report was published in June 2002.
- He co-supervised a total of 10 Doctoral and 20 Masters' students in electric power engineering, together with renowned professors in Brazilian universities. He also acted as External Examiner to over 100 MSc and PhD theses, in Brazil and abroad.
- He has been an invited panelist in 35 major international conferences. He has given brief courses on "Advanced Computer Methods for Small Signal Stability Analysis and Control" in 20 countries (Brazil, Chile, USA, Canada, UK, Norway, Sweden, France, Germany, Japan, Iran, Switzerland, Finland, Mexico, Colombia, Greece, China (Mainland), Hong Kong, New Zealand, South Africa).

Engineering Studies

- He worked in power system engineering studies related to power system dynamics and control, per the request of major utilities or manufacturers. Some of these studies are described below:
- He was the international consultant to a study for the improved dynamic performance of the Interconnected Chilean System – UNDP Project CHI/87/030/11-14.
- He was the CEPEL consultant to the EPRI Research Projects 2675-4/5 “DC-Multi-Infed Study” and 3022-33/34 “Analysis of Control Interactions on FACTS Assisted Power Systems” (1996 – 1997).
- He was consultant and coordinator of a large study for the stabilization and resilience of the Argentinean Interconnected Electric System. This study was contracted by CAMMESA, the Argentinean system operator, and conducted by a consortium formed by the partners: Mercados Energéticos (Argentine), ABB (Argentine), REIVAX (Brazil), CEPEL (Brazil).
- He participated in the Brazilian South-Southeast maximum power transfer studies (1985). These engineering studies were carried out by an Eletrobras Working Group and lasted for several years, leading to several company reports GCOI-Eletrobras and a few joint publications. The small-signal stability program used in this project was AUTOVAL, a predecessor of PacDyn, and also developed by him and CEPEL colleagues.
- Brazilian North-South Interconnection – he was consultant and the CEPEL coordinator for this large feasibility study, conducted by a multi-utility Working Group from GCOI-Eletrobras, for using only retuned and modernized power system stabilizers in the major Brazilian power plants (1997-1999) to damp the poorly damped, low-frequency (0.2 Hz) oscillation. The stabilizer structures and tunings proposed by this study were later implemented in three major hydro power plants located in the Brazilian Northeast.
- Comparing the cost-effectiveness of the AC and DC alternatives for the transmission of 800 MW from a Bolivian natural gas terminal to Coxipó, MT, Brazil. He coordinated this work, which was contracted by ABB.
- Itaipu 50 Hz Connection to the Argentinean System – this work was contracted by FURNAS to determine the feasibility of importing 400 MW from the REGER generating company, in Argentina, and transmitting it to the Brazilian Southeast System, through the Itaipu HVDC transmission system which had this available transmission capacity margin. He coordinated this work, which investigated some of the stability issues involving the electric interconnection of the Brazilian, Argentinean, Uruguayan and Paraguayan systems (2001).
- Itaipu Power Plant Tests – these tests were conducted under a Memorandum of Understanding project between the Brazilian Army (Military Institute of Engineering) and the Itaipu Binacional, with the participation of CEPEL. The results from these tests are reported in one IEEE Transactions on Power Systems paper and three conference papers (2009 – 2011).

CIGRE-Related

- CIGRE member since 1979.

- Convener of CIGRE Task Force 38.02.16 on "Interaction among Power System Controls", and Editor of the 294-page CIGRE Brochure 166, August 2000.
- Convener of CIGRE Task Force C4.602 on "Coordinated Voltage Control in Transmission Networks", and Editor of the 285-page CIGRE Brochure 310, February 2007.
- Active member, CIGRE Task Force 38.02.12, "Criteria and Countermeasures for Voltage Collapse" (CIGRE Brochure 101, October 1995).
- Active member, CIGRE Task Force 38.01.07, "Analysis and Control of Power System Oscillations" (CIGRE Brochure 111, December 1996).
- Active member, CIGRE Task Force 38.02.17, "Advanced Angle Stability Controls" (CIGRE Brochure 155, April 2000).
- Second Vice-President of CIGRE-Brasil (2000 – 2003). In this capacity, he was in charge of the technical publication "EletroEvolução", which has been cited by the CIGRE Technical Committee as an example to be followed by other CIGRE National Committees.
- Member of the Administrative Council of CIGRE-Brasil, for the period 2003-2007.
- Member of the technical committee and reviewer of papers for all CIGRE-Brasil SEPOPE international conferences since 1987. This conference is held every two years in different Brazilian cities. It includes the participation of top international power system experts and it is the main forum in Brazil for the discussion of power system analysis, transmission expansion planning and system operation planning issues.
- Deputy-Chairman of the IX SEPOPE Conference, Rio de Janeiro 2004.
- Technical Committee Chairman of the X SEPOPE Conference, Florianopolis 2006.
- Technical Committee Chairman of the XI SEPOPE Conference, Belem 2009.
- General Chairman of the XII SEPOPE Conference, Rio de Janeiro, 2012.
- Participant since 1979 as author and panelist in many of the CIGRE-Brasil SNTPEE seminars. Today, SNTPEE (National Electric Power Production and Transmission Seminar) is the largest conference of electrical power professionals in Brazil. It has a similar format to that of the General Session of CIGRE in Paris. Currently, it is the second largest CIGRE event in the world, with over 2,000 participants.
- Special Reporter at one SNTPEE seminar for the Brazilian branch of the old CIGRE Study Committee 38.
- Liaison for CIGRE SC 38 and SC4 with the IEEE PES Power System Dynamic Performance Committee for the 2001-2009 period.

IEEE-Related

- IEEE PES member since 1981.

- Chair of the task force on Power System Restoration Dynamics, reporting to the Power System Dynamic Performance Committee of the Power and Energy Society (PES), which was created in June 2007 and disbanded in July 2013.
- Co-editor, with Mike Adibi as Principal Editor, of the 343-page Special Publication on "Power System Restoration Dynamics – Issues, Techniques, Planning, Training & Special Considerations", which was approved by PSDP Committee and the PES Technical Committee in July/August 2013 and is currently awaiting publication.
- Member of the IEEE Power Engineering Society since 1980, and active member of the Power System Dynamic Performance Committee since 1989.
- Chair of the Power System Stability Controls Subcommittee, IEEE-PES Power System Dynamic Performance Committee, from 2003 to 2007.
- Chair of the Small Signal Stability Focus Group, Power System Dynamic Performance Committee, from 1998 to 2003.
- Editor (with Dr. J. Sanchez-Gasca) of the IEEE PES Special Publication no. 06TP177 "Recent Applications of Linear Analysis Techniques for Small Signal Stability Analysis and Control", September 2006.
- Member of the IEEE-PES Fellow Committee, 2002-2004 and 2009-2011

TECHNICAL PUBLICATIONS

Dr. Martins has authored 200 technical papers and edited 4 books. These include:

- 39 papers in the IEEE Transactions on Power Systems and on Power Delivery.
- 2 papers in the IET Generation, Transmission and Distribution journal.
- 2 papers in the International Journal of Electrical Power and Energy Systems.
- 2 papers in numerical linear algebra journals (Linear Algebra and its Applications, and SIAM Journal on Scientific Computing).
- 5 papers in IEEE PES special publications.
- 2 IEEE Special Publications (Editor, with Dr. Juan Sanchez-Gasca, published by PES in 2006; Co-editor, with Mike Adibi, of a report that is awaiting publication by PES, in 2013).
- 2 CIGRE Technical Brochures (editor and chair of the associated task forces).
- Section entitled "Eigenvalue Methods and Model Order Reduction" with 21 pages and co-authored with Joost Rommes, in chapter "Model Order Reduction – The Basics" of the book prepared by the European COMSON project on Model Order Reduction, edited by E. Jan ter Matten, Springer, to

appear in late 2013.

- Co-author, with Joost Rommes, Francisco Freitas and Patrik Kürshner, of the Section "Power System Examples" of the MOR Wiki, a comprehensive repository of data files for large dynamic system models of various natures, together with instructions for their use as benchmarks in model order reduction work. The MOR Wiki also points to a site for the download of the M-files for the eigenvalue algorithms developed by Nelson Martins in association with co-authors Joost Rommes, Francisco D. Freitas and Paulo Pellanda. Link: http://morwiki.mpi-magdeburg.mpg.de/morwiki/index.php/Power_system_examples
- 6 papers in the Proceedings of the CIGRE Paris Session.
- 2 papers in CIGRE's Electra.
- 140 papers in conferences and workshops organized by IEEE, CIGRE-Brasil and by CIGRE committees SC-38, SC-39, SC-C2 and SC-C4.
- Dr. Martins' publications have been well cited, as indicated by his h-index of 15 (45 articles with 861 citations), according to the ISI Web of Knowledge citation metrics, and h-index of 26 (164 papers with 2,675 citations), according to the Google Scholar metrics.

The following pages list these and other publications by year.

MAIN 2013 PUBLICATIONS

Journal Papers and Book Chapters

1. DE MARCO, F.J., MARTINS, N., FERRAZ, J.C., "An Automatic Method for Power System Stabilizers Phase Compensation Design". IEEE Transactions on Power Systems, USA, Vol. 28, No. 2, p. 997-1007, May 2013.
2. VIANA, E.M., OLIVEIRA, E.J., MARTINS, N., PEREIRA, J.L.R., de OLIVEIRA, L.W., "An Optimal Power Flow Function to Aid Restoration Studies of Long Transmission Segments". IEEE Transactions on Power Systems, USA, Vol. 28, No. 1, p. 121-129, February 2013.

Conference Papers, Presentations and Reports

1. FERREIRA, O.S., PELLANDA, P.C., MARTINS, N., "Ensaio Pouco Invasivo para Avaliação de Estabilizadores de Usinas Multigeradores". Revista Militar de Ciência e Tecnologia – RMCT, Rio de Janeiro, Brazil, March 2013.
2. DE MARCO, F., APOLINÁRIO Jr, J.A., PELLANDA, P.C., MARTINS, N., "Efficient Online Estimation of Electromechanical Modes in Large Power Systems". Proceedings of IV IEEE Latin American Symposium on Circuits and Systems - IEEE LASCAS 2013, Cusco, Peru, March 2013.

3. VARRICCHIO, S.L., FREITAS, F.D., MARTINS, N., "Aspectos Visuais e Numéricos dos Desvios em Modelos de Ordem Reduzida Obtidos por Meio de um Método de Cálculo de Modos Dominantes Multivariável"., Proceedings of XV ERIAC Conference, Iguassu Falls, Brazil, May 2013.
4. VARRICCHIO, S.L., FREITAS, F.D., MARTINS, N., "Spectral Energy Indices for Model Order Reduction". Proceedings of IEEE PES General Meeting, Vancouver, Canada, July 2013.

MAIN 2012 PUBLICATIONS

Journal Papers and Book Chapters

1. DUMISANI, D.D., PAL, B.C., JABR, R.A., MARTINS, N., "Robust and low-order design of flexible ac transmission systems and power system stabilisers for oscillation damping". IET Generation, Transmission and Distribution, UK, Vol. 6, No. 5, May 2012, pp. 445 - 452.
2. JABR, R.A., MARTINS, N., PAL, B.C. , KARAKI, S.A., "Contingency Constrained VAR Planning Using Penalty Successive Conic Programming". IEEE Transactions on Power Systems, USA, Vol. 27, No. 1, February 2012, pp. 545-553.

Conference Papers, Presentations and Reports

1. BOSSA, T.S., PELLANDA, P.C., MARTINS, N., "Identificação da Dinâmica Dominante de Malha Aberta em Sistemas de Malha Fechada: Aplicação em Estabilizadores de Sistemas de Potência". Revista Militar de Ciência e Tecnologia, – RMCT, Rio de Janeiro, Brazil, 2012.
2. FERREIRA, S.O., MARTINS, N., PELLANDA, P.C., "Verificação do Ajuste de Sinais Estabilizadores em Usinas de Energia Elétrica por Procedimento Automático de Ensaio de Campo pouco Invasivo". Proceedings of XII SEPOPE Conference, Rio de Janeiro, Brazil, May 2012.
3. DE MARCO, F., MARTINS, N., ZENI Jr, N., SILVA, A.S., "Comparando os desempenhos de dois estabilizadores modernos: Integral de Potência Acelerante (PSS2B) versus Multi-banda (PSS4B)". Proceedings of XII SEPOPE Conference, Rio de Janeiro, Brazil, May 2012.
4. VARRICCHIO, S.L., VÉLIZ, F.C., FREITAS, F.D., MARTINS, N., "Síntese de Equivalentes Dinâmicos de Redes Elétricas Multi-Conectadas". Proceedings of XII SEPOPE Conference, Rio de Janeiro, Brazil, May 2012.
5. FERREIRA, O.S., MARTINS, N.,PELLANDA, P.C., PINHEIRO, G.M., "Controle Dissociado de Velocidade Translacional e Amortecimento de Modos Oscilatórios em Trens Longos de Carga". Proceedings of XIX Congresso Brasileiro de Automatica – CBA 2012, Campina Grande, Brazil, September 2012.

MAIN 2011 PUBLICATIONS

Journal Papers and Book Chapters

1. FREITAS, F.D., MARTINS, N., VARRICCHIO, S.L., ROMMES, J., VELIZ, F.C., "Reduced-Order Transfer Matrices from RLC Network Descriptor Models of Electric Power Grids". IEEE Transactions on Power Systems, USA, Vol. 26, No. 4, November 2011, pp. 1905-1916.
2. BOSSA, T. S., MARTINS, N., da SILVA, R. J. G. C. , PELLANDA, P. C., "A Field Test to Determine PSS Effectiveness at Multigenerator Power Plants". IEEE Transactions on Power Systems, USA, Vol. 26, No. 3, August 2011, pp. 1522-1533.

Conference Papers, Presentations and Reports

1. FREITAS, F.D., ROMMES, J., MARTINS, N., "Low-rank Gramian Applications in Dynamics and Control". Proceedings of International Conference on Communications, Computing and Control Applications - CCCA'11, Hammamet, Tunisia, March 2011.
2. BOSSA, T.H., PELLANDA, P.C., SILVA, R.J.G.C., MARTINS, N., "Novo Teste de Campo para Sinais Adicionais Estabilizadores e sua Aplicação na Usina de Itaipu". Proceedings of XXI SNPTEE, Florianópolis, Brazil, October 2011.

MAIN 2010 PUBLICATIONS

Journal Papers and Book Chapters

1. ABR, R.A., PAL, B.C., MARTINS, N., FERRAZ, J.C.R., "Robust and Coordinated Tuning of Power System Stabilizer Gains using Sequential Linear Programming". IET Generation, Transmission and Distribution, Vol. 4, No. 8, pp. 893 - 904, 2010.
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