Luigi Vanfretti

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Objective

To obtain a position as a research and development engineer working as part of a team developing techniques, algorithms and computational tools that address critical challenges faced in the electric power and energy industries.

Education & Training

◇ Rensselaer Polytechnic Institute, Troy, NY, USA.
Ph.D. Candidate in Electric Power Engineering, to graduate in December 2009.
Thesis Topics: (i) Novel methods for phasor data-based state estimation. (ii) Analysis of power system voltage and frequency oscillations and mode shapes using linear models. Advisor: Prof. Joe H. Chow.

◇ Rensselaer Polytechnic Institute, Troy, NY, USA.
M.Sc. Electric Power Engineering, August 2007.
Major: Electric Power Engineering, Minor: Control Systems.
Thesis Title: "Notions of Phasor Measurement-Based Power System Model Reduction of Large Power Systems", July 2007. Advisor: Prof. Joe H. Chow.

◇ The University of Glasgow, Scotland, UK.
Visiting Researcher, Dept. of Electronics and Electrical Engineering, Fall 2005.
Research Topics: (i) Individual Channel Analysis and Design (ICAD) for power system applications. (ii) Dynamic Power Flows. Advisor: Enrique Acha.

◇ Universidad de San Carlos de Guatemala, Guatemala City, Guatemala.
Electrical Engineering Degree - *Licenciatura* (Electric Power Concentration), June 2005.
Undergraduate Thesis Title: "Modeling and simulation of the synchronous machine and its operation in power systems".

Research Interests

◇ Synchronized phasor measurements and their applications in power systems.
◇ Modeling, dynamics, stability, control, and security of electric power systems.
◇ Open source software for electric power system engineering.

Working, Research and Teaching Experience

◇ Rensselaer Polytechnic Institute, Troy, NY, USA.
Research Assistant, ECSE Department, January 2007-Present.
Performed research on reduced order models based on phasor measurements. Analyzed PMU Data of disturbances in the Eastern Interconnection. Developed new methods for state estimation in power systems using phasor data. Examined propagation characteristics of voltage and frequency oscillations from interarea modes. Collaborated on NSF Sponsored US-Africa research and education development.

◇ Rensselaer Polytechnic Institute, Troy, NY, USA.
Teaching Assistant, ECSE Department, Jan. - Dec. 2006, Jan. - May 2009.
Assisted professors with grading and teaching the following courses: Introduction to Engineering Electronics, Fields & Waves, Control Systems Engineering, Power Engineering Fundamentals, and Computer Methods in Electric Power Engineering (graduate course).

◇ Universidad Mariano Gálvez, Guatemala.
Assistant Instructor, Faculty of Information Sciences, January - June 2005.
Class instructor and laboratory instructor for the Signals & Systems, and Control Systems II courses.

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◇ Universidad de San Carlos, Guatemala.
Teaching Assistant, Department of Mathematics & School of Mechanical and Electrical Engineering, July 2003 - June 2005.
Assisted professors with grading and teaching Numerical Methods and Calculus courses in the Mathematics Department. Served as Lab. Instructor and TA for the Power System Analysis, and Basic Electrical Eng. courses.

◇ Empresa de Transporte y Control de Energía Eléctrica (ETCEE-INDE), Guatemala.
Engineering Assistant (Internship), Transmission Lines Dept., July - November 2004.
Performed electrical and mechanical design of transmission lines. Documented mechanical designs for new towers in blue prints, digitized previous designs in Autocad.

Awards and Prizes

◇ *NSF Sponsored Graduate Student Scholarship*, "Cyber Security for Process Control Systems Summer School" organized by Information Trust Institute (ITI), University of Illinois. June 2008.
◇*Student Support Award*, for attendance to *IEEE PES General Meeting* 2006, 2007, 2008, 2009; and IEEE PES PSCE 2006, 2009.
◇ *Service Award*, Electrical Computer and Systems Eng. Department, Rensselaer Polytechnic Institute, 2007.
◇ *Third Place*, Student Poster Contest, IEEE Power System Conference and Exposition (PSCE) 2006.
◇ *Francisco Vela* award for best overall academic achievement and undergraduate research graduation project. Awarded by *Facultad de Ingeniería*, *Universidad de San Carlos de Guatemala.*, February 2006.

Other Professional Activities

◇ *Journal Peer Reviewer:* IEEE Transactions on Power Systems, Simulation Modeling Practice and Theory (Elsevier).
◇ *Active Contributing Member of:* Research Initiatives Task Team of the North American Synchrophasor Initiative (NASPI), Open Source Software Task Force (IEEE PES), Power System Dynamic Measurements Working Group (IEEE PES), Modal Identification of Electromechanical Modes Task Force (IEEE PES).
◇ *IEEE Officer Positions:* Secretary, RPI IEEE Student Branch, 2008. Chairman, RPI IEEE PES Student Branch 2008.

Publications

(5) Journal Papers, **(10)** Conference Papers.

Selected Journal Papers

◇ **L. Vanfretti** and F. Milano, "The Experience of PSAT as a Free and Open Source Software for Power System Education and Research," to appear, *International Journal of Electrical Engineering Education*, accepted May 2008.
◇ J. H. Chow, A. Chakrabortty, **L. Vanfretti**, and M. Arcak, "Estimation of Radial Power System Transfer Path Dynamic Parameters using Synchronized Phasor Data", *IEEE Transactions on Power Systems*, Vol. 23, No. 2, pp. 564-571, May 2008.
◇ C.E. Ugalde-Loo, **L. Vanfretti**, E. Acha and E. Liceaga-Castro, "Synchronous Generators Modeling Using the Framework of Individual Channel Analysis and Design. Part 1," *International Journal of Emerging Electric Power Systems*, Vol. 8, Iss. 5. Article 4. November 21, 2007.

Selected Conference Papers

◇ **L. Vanfretti**, J. H. Chow, S. Sarawgi, and D. Ellis, "A Framework for Estimation of Power Systems Based on Synchronized Phasor Data," In Proceedings of the IEEE PES General Meeting 2009.
◇ **L. Vanfretti**, and J. H. Chow, "Computation and Analysis of Power System Voltage Oscillations from Interarea Modes," In Proceedings of the IEEE PES General Meeting 2009.
◇ **L. Vanfretti**, U. Aliyu, J. H. Chow, and James Momoh, "System Frequency Monitoring in the Nigerian Power System," In Proceedings of the IEEE PES General Meeting 2009.

Languages

English (fluent). Spanish (native). Italian (fluent speaking, basic writing).

Personal References

Available by request.