

Mahyar Zarghami

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Education

- 2005-2008 **Missouri University of Science & Technology** (formerly **University of Missouri-Rolla**), Rolla, MO, USA
Ph.D., Electrical Engineering
- 1999-2001 **Sharif University of Technology**, Tehran, IRAN
M.Sc., Electrical Engineering
- 1988-1993 **K.N. Toosi University of Technology**, Tehran, IRAN
B.Sc., Electrical Engineering

Appointments

August 2011- Present

Assistant Professor
Electrical and Electronic Engineering Department,
California State University, Sacramento, California, USA

- Teaching
- Research activities in California Smart Grids Center (CSGC)
 - Volt-VAr control.
 - Load demand peak-shaving using heuristic methods.
 - Conservation Voltage Reduction (CVR).
 - Integration of renewable energy sources in distribution and transmission systems.
 - Application of synchronized measurements in wide-area control and protection of large-scale power systems.

Jan. 2009- August 2011

Senior R&D Engineer
US Corporate Research Center, ABB Inc., Raleigh, North Carolina, USA

- Indoor LVDC (Project Leader)
 - Research and investigation on the applications of low voltage DC distribution in commercial buildings, Data and Communication centers.
- Energy Storage Systems for DC Railway Applications
 - Research and investigation on the application of energy storage technologies such as ultracapacitors and flywheels in DC railway systems for increasing the efficiency of the railway system.
- CES (Community Energy Storage)
 - Optimized charge/discharge of CES units for reducing Utility's costs.
- Wind Turbine Aggregation Modeling

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- Aggregation of the wind turbines in the wind farms based on coherent grouping with Wake modeling and conservation of power losses.
- Wide Area Protection with WAMs
 - Voltage collapse protection with WAMs using a combination of sensitivity, VIP (Voltage Instability Predictor) and SDI (S Difference Indicator) methods.
 - Out of step protection with WAMs using synchronized power measurements.
- Integrated Power System Simulation for Electric Ships
 - Investigation of new design concepts for all-electric ship integrated power systems (IPS).
 - Steady-State and Dynamic simulation and analysis of electric ship designs.
- Distribution Feeder Event Analysis (DFEVA)
 - Zone Identification, Fault Classification and Fault Location of the distributed feeders using measured data from IEDs (Intelligent Electronic Devices). Included programming with C and AFL.
- DMS600 UBLF (Unbalance Load-Flow, ABB Product)
 - Design and implementation of the code for unbalanced network modeling, topology analysis and unbalanced load-flow engine in DMS600 MicroScada (ABB product). Included programming with Visual C++.
- CDS (Common Design System, ABB product)
 - Design and Optimization of Distribution Transformers using heuristic and analytical methods. Optimization with MATLAB and Frontline. Included programming with Visual Basic .NET.

May 2005-Dec. 2008

Research Assistant

Rolla, MO, USA

Electrical Engineering Department, University of Missouri-Rolla

- Methods for damping inter-area oscillations by FACTS controllers.
- Dynamic state estimation in large scale power systems based on combinations of local and global synchronized measurements.
- Dynamic placement of the FACTS controllers with modal analysis.

Jan. 2005-May 2005

Research Assistant

Rolla, MO, USA

Real-Time Power and Intelligent System Laboratory, University of Missouri-Rolla

Wide-Area Protection of Power Systems using LVQ (Learning Vector Quantization) Neural Networks.

Nov. 2001-Dec. 2004

Project Manager

MATN Co. (Electric Power Technology Center), Tehran, IRAN

- Comprehensive Distribution System Planning for Ilam, Sanandaj and Behbahan cities in Iran.

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- Distribution system data collection, database formation, load-flow analysis, short-circuit analysis, relay and fuse coordination, medium and long-term load forecast, reliability analysis, optimal sub-transmission and distribution substation placement, optimal feeder placement.

- Development of the MATNex software

- Object oriented programs with Visual C.NET for balanced and unbalanced radial and weakly meshed distribution systems, including load-flow analysis, short-circuit analysis and fuse coordination.

- Design and implementation of distribution system database with Microsoft Access.

- GIS based software implementation for analysis and design of distribution networks using Autocad.

- Interfacing MODEC with DIgSILENT

- Development of programs in Visual C .NET for data conversion between MODEC and DIgSILENT software packages.

March -Dec. 2004

Consulting Engineer

MATN Co. (Electric Power Technology Center), Tehran, IRAN

- Preliminary Studies on Enhancement of the Iranian Transmission Power System

- Participation in technical sessions conducted by TAVANIR (Company responsible for the operation of Iran's transmission network).

June 1999- Nov. 2001

Consulting Engineer

A.P.S. Consultants (Awdge Pazhoohesh Sanaat), Tehran, IRAN

- Distribution Plants Design and Analysis (for Pars-Khodro Company, Bandar Abbas Graving Dock, Kerman-Khodro Co., Caspian Sea Semi-Submersible Petroleum Harbor)

- Feasibility studies on substations type, load analysis and modeling, load-flow analysis, optimal feeder placement, short-circuit analysis, relay and fuse coordination.

- Development of the RadIRing software packages

- Object oriented programs developed in Visual C++ for the design and analysis of radial industrial distribution networks. Including load-flow, short-circuit, load-modeling, cable and feeder design and placement.

March 1996- June 1999

Research Engineer

MATN Co. (Electric Power Research Center), Tehran, IRAN

- Application of Expert Systems to Fault Diagnosis in Touss Power Plant, Mashad, IRAN

- Design and implementation of a model-based expert system for fault diagnosis in Touss power plant located in Mashad, Iran. Include programming with Borland C++.

- Topology Determination of the Iranian Transmission Power Network

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- Design of a new algorithm for determination of the topology of the Iranian HV network based on conditions of the loops before and after switching operations. Include programming with Pascal.

- Contingency Analysis of the Iranian HV Network

- Implementation of different contingency scenarios in the transmission network for finding remedial actions in response to worst case conditions. Included programming with Borland C++.

Oct. 1998- August 1999

Consulting Engineer

Kerman Regional Power Authority, Kerman, IRAN

- Alarm Processing in the Iranian South-East Dispatching Center by Expert Systems

- Extraction and implementation of a hypothesis-based expert scheme for processing numerous cascading alarms in the dispatching center in order to create simple and short meaningful sentences for system operators. Included programming with Borland C++.

Sep. – Dec. 1995

Consulting Engineer

MATN Co. (Electric Power Research Center), Tehran, IRAN

- Applying Sparse Techniques to the simulation of HVDC Systems

- Design and implementation of sparse techniques to the simulation of large HVDC systems. Included programming with Pascal.

April – Oct. 1994

Consulting Engineer

MATN Co. (Electric Power Research Center), Tehran, IRAN

- Load-Flow of Large Scale Radial Distribution Systems

- Design and implementation of an algorithm for load-flow analysis based on dividing the system into multiple sub-networks for minimizing the need for memory space. Included programming with Pascal.

Teaching Experience

August 2007 - Present

Assistant Professor

Electrical and Electronic Engineering Department, California State University, Sacramento

- Electromechanics Laboratory (EEE 131)
 - Undergraduate level, 1 credit hour, laboratory.
- Smart Electric Power Grid (EEE 136)
 - Undergraduate level, 3 credit hour, lecture.
- Power System Analysis (EEE 141)
 - Undergraduate level, 3 credit hours, lecture.
- Energy Systems Control and Optimization (EEE 142)
 - Undergraduate level, 3 credit hours, lecture.
- Advanced Analysis of Faulted Power Systems (EEE 250)

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- Graduate level, 3 credit hours, lecture.
- Power System Reliability and Planning (EEE 252)
 - Graduate level, 3 credit hours, lecture.
- Introduction to Future Power Systems and Smart Grids (EEE 255)
 - Graduate level, 3 credit hours, lecture.
- Wind Energy Electrical Conversion Systems (EEE 257)
 - Graduate level, 3 credit hours, lecture.
- Advanced Topics in Power Systems (EEE 259)
 - Graduate level, 3 credit hours, lecture.

August 2007 – Dec. 2007

Instructor

Electrical and Computer Engineering Department, University of Missouri-Rolla

- Electromechanics (EE 205)
 - Undergraduate level, 3 credit hours, lecture.

2000

Teaching Assistant

Electrical Engineering Department, Sharif University of Technology

- Electric Machinery
 - Undergraduate level, 3 credit hours, lecture. Taught for one semester.
 - Responsibilities included holding review sessions covering dc and ac machinery fundamentals.

Professional Training

June – Sep. 2013

High Voltage Direct Current Transmission

University of Aberdeen, UK

Oct. – May 2010

Real-Time Digital Simulator (RTDS®)

ABB Inc., Raleigh, NC, USA

Nov. 2003

High Voltage Substation Design

MATN Co., Tehran, IRAN

Sep. 2003

DIgSILENT

MATN Co., Tehran, IRAN

Dec. 2002 – June 2003

Web Programming with ASP .NET

**Sharif University of Technology,
Tehran, IRAN**

Jan. 1999

Visual C++

MATN Co., Tehran, IRAN

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Honors

- Technical paper "A Wide-Area Loss-Index Based method for Voltage Instability Protection" chosen among the best conference papers in *IEEE Power and Energy Society (PES) General Meeting 2014, July 27-31*.
- Selected Researcher by Iran's Committee of Electrical & Electronics Engineers in year 2004.
- Selected author for the paper: "A Frequency-Dependent Root-Matching Scheme in Electromagnetic Transient Analysis", *5Th Power Seminar, Shahid Abbaspour University, 15-17 October 2003, Tehran, IRAN*.
- 1st rank as the representative of Electrical Department of MATN Co. in Educational Services for the years 1997 & 1998.

Skills

- Computer Languages: FORTRAN, Pascal, C++, Borland C++, Visual C++, Visual C .NET, C#, Visual Basic
Familiar with Java, UML
- Engineering Software Packages: PSCAD/EMTDC, MATLAB/Simulink, DIGSILENT
Familiar with: pSpice
- Optimization Toolbox: Frontline
- Web Skills: HTML, FrontPage, ASP, ASP.NET, JavaScript
Familiar with: VBScript
- Database: Microsoft Access
Familiar with SQL Server
- Cad Skills: Autocad

Affiliations

2014- Present	Senior Member , IEEE
2008-2014	Member , IEEE
2005- 2008	Student Member , IEEE
2002-2005	Member , Iranian Association of Electrical & Electronics Engineers (IAEEE)
2004-2005	Member , Iranian Solar Energy Society

Professional Activities

2012-present	Secretary , IEEE Sacramento Valley Section.
2012-present	Vice Chair , Power and Energy Society, IEEE Sacramento Valley Section.
2011	Co-chair , Smart Grids track, IEEE Green Technologies Conference.

Publications

Journals

- 1) M. Zarghami, Mariesa L. Crow, S. Jagannathan, "Nonlinear Control of FACTS Controllers for Damping Interarea Oscillations in Power Systems", *IEEE Transactions on Power Delivery*, vol. 25, no. 4, pp. 3113-3121, Oct. 2010.
- 2) M. Zarghami, Mariesa L. Crow, S. Jagannathan, Y. Liu, S. Atcitty, "A Novel Approach to Inter-Area Oscillation Damping by Unified Power Flow Controllers Utilizing Ultracapacitors", *IEEE Transactions on Power Systems*, vol. 25, no. 1, pp. 404-412, Feb. 2010.
- 3) M. Zarghami, Mariesa L. Crow, "The Existence of Multiple Equilibria in the UPFC Power Injection Model", *IEEE Transactions on Power Systems*, vol. 22, no. 4, pp. 2280-2282, Nov. 2007.
- 4) A.M. Ranjbar, M.R. Nahass, F. Shahbazi, M. Zarghami, "Optimal Load-Shedding to Avoid Line Overloads in Emergency Conditions For Iranian Network", *Bargh Journal of Electrical Science and Technology*, no. 23, Feb. & March 1998.
- 5) M. Zarghami, H. Monsef, "Electric Network Topology Determination by Demarcating Loops in Network Graph", *Bargh Journal of Electrical Science and Technology*, no. 21, March 1997.

Conferences

- 1) Dongyi Zhang, Tao Liang, Xiaojun Feng, Mahyar Zarghami, M. Vaziri, "A State-Space Model for Integration of Battery Energy Storage Systems in Bulk Power Grids", to be presented in *North American Power Symposium (NAPS) 2015*, Oct. 4-6, 2015, Charlotte, NC, USA.
- 2) F. Shabaninia, M. Seyedyazdi, M. Vaziri, M. Zarghami, "State Estimation in a Power Distribution Grid based on WLS and EKF Techniques", *IEEE IRI Conference*, August 13-15, 2015, San Francisco, California, USA.
- 3) L. Nie, W. Fu, M. Vaziri, M. Zarghami "Higher I-2t Stress on Equipment Due to Increased Penetration of Distributed Generation", *IEEE Power and Energy Society (PES) Conference – July 26-30, 2015, Denver, Colorado, USA*.
- 4) M. A. Tayyab, M. Vaziri, A. Yazdani, M. Zarghami "Distributed Generation Effects on Voltage Profile of Distribution Grid with SVC and Smart Inverter", *IEEE Power and Energy Society (PES) Conference – July 26-30, 2015, Denver, Colorado, USA*.
- 5) Z. Cramer, M. Vaziri, M. Zarghami, S. Vadhva, "Distribution Substation Bus Design for Optimal Reliability and Economics" *Proceedings of the IEEE Power and Energy Society (PES) Conference – July 26-30, 2015, Denver, Colorado, USA*.
- 6) G. Madingou, M. Zarghami, M. Vaziri, "Fault Detection and Isolation in a DC Microgrid using a Central Processing Unit", *IEEE PES Conference on Innovative Smart Grid Technologies*, Feb. 17-20, 2015, Washington, DC.
- 7) A. Rahimi, A. Cloninger, M. Zarghami, M. Vaziri, "Investigation on Volt-VAR Control Using CVR at Various Photovoltaic Penetration Levels", *2014 North*

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- American Power Symposium (NAPS), Sep. 7-9, Washington State University, Pullman, WA.*
- 8) J. Icenhower, M. Zarghami, M. Vaziri, "A Heuristic Power Optimization Method for Photovoltaic Systems", *2014 North American Power Symposium (NAPS), Sep. 7-9, Washington State University, Pullman, WA.*
 - 9) F. Shabani, M. Vaziri, M. Amini, M. Zarghami, S. Vadhva, "Kalman-Filter Algorithm and PMUs for State Estimation of Distribution Networks", *15th IEEE International Conference on Information Reuse and Integration (IRI), Aug. 13-15, San Francisco, CA, USA.*
 - 10) Mahyar Zarghami, Reynaldo Nuqui, "A Wide-Area Loss-Index Based method for Voltage Instability Protection", *IEEE PES General Meeting 2014, July 27-31.*
 - 11) M. Zarghami, B. Kaviani, F. Tavatli, M. Vaziri, "Complex Power Optimization of Photovoltaic Systems", *IEEE PES General Meeting 2014, July 27-31.*
 - 12) D. Ilse, M. Vaziri, M. Zarghami, S. Vadhva, "Review of Concepts to increase Distributed Generation into the Distribution Network", *IEEE Greentech 2014, April 3-4.*
 - 13) M. Tesfasilassie, M. Zarghami, M. Vaziri, A. Rahimi, "An Estimative Approach for CVR Effectiveness Using Aggregated Load Modeling", *IEEE PES Conference on Innovative Smart Grid Technologies, Feb. 19-22, 2014.*
 - 14) A. Rahimi, M. Zarghami, M. Vaziri, S. Vadhva, "A Simple and Effective Approach for Peak Load Shaving Using Battery Storage Systems", *2013 North American Power Symposium (NAPS), Sep. 22-24, Kansas State University, Manhattan, KS.*
 - 15) Mahyar Zarghami, "Improvement of Transient Stability of Hybrid Supergrids with Coordinated Operation of Fast Storage Devices", *EPRI HVDC & FACTS Conference, Palo Alto, CA, USA, Aug. 28-29 2013.*
 - 16) A. Rahimi, M. Zarghami, M. Vaziri, S. Vadhva, "Application of Battery Storage Systems in Peak Load Shaving", *Power and Energy Conference: Electric Vehicles and Energy Storage, Cal Poly IEEE Power and Energy Society, May 10, 2013.*
 - 17) Mahyar Zarghami, M. Vaziri, A. Rahimi, S. Vadhva, "Applications of Battery Storage Systems to Improve Performance of Power Systems", *2013 IEEE Green Technologies Conference, April 4-5, Denver, Colorado, USA.*
 - 18) M. Vaziri, M. Afzal, M. Zarghami, A. Yazdani, S. Vadhva, "Voltage Impacts of DG Distributed Grid with Voltage Regulators and SVCs", *2013 IEEE Green Technologies Conference, April 4-5, Denver, Colorado, USA.*
 - 19) Mahyar Zarghami, "A Procedural Approach in Teaching and Assessment of Engineering Classes", *16th Annual CSU Teaching Symposium, The California Maritime Academy, Feb. 22-23, 2013.*
 - 20) F. J. Sada Rodríguez, Antonios Marinopoulos, Muhamad Reza, Kailash Srivastava, Jiuping Pan, Mahyar Zarghami, Dirk Van Hertem, "Dynamic modeling of large Wind Farms including wake effect", *European Wind Energy Association (EWEA) OFFSHORE 2011, 29 Nov.-1 Dec. 2011, Amsterdam, Netherlands.*
 - 21) Mahyar Zarghami, Mariesa L. Crow, "A Unified Platform for Dynamic Modeling and Simulation of Hybrid AC/DC Systems", *EPRI HVDC & FACTS Conference, Palo Alto, CA, USA, Aug. 2011.*

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- 22) A. Marinopoulos, J. Pan, M. Zarghami, M. Reza, K. Yunus, C. Yue, and K. Srivastava, "Investigating the impact of Wake effect on Wind Farm Aggregation", *IEEE Trondheim Powertech 2011*, 19-23 June 2011.
- 23) M. Zarghami, Mariesa L. Crow, S. Jagannathan, Y. Liu, S. Atcitty, "A Novel Approach to Inter-Area Oscillation Damping by Unified Power Flow Controllers Utilizing Ultracapacitors", *Power & Energy Society General Meeting*, July 2010, Minneapolis, Minnesota, USA.
- 24) Reynaldo F. Nuqui, M. Zarghami, M. Mendik, "The Impact of Optical Current and Voltage Sensors on Phasor Measurements and Applications", *IEEE Transmission and Distribution Conference and Exposition (T&D)*, April 2010, New Orleans, USA.
- 25) M. Zarghami, Mariesa L. Crow, S. Jagannathan, "Dynamic Placement and Signal Selection for UPFCs in Wide-Area Controlled Power Systems", *IEEE Transmission and Distribution Conference and Exposition (T&D)*, April 2010, New Orleans, USA.
- 26) M. Zarghami, Mariesa L. Crow, "Optimal Dynamic Placement and Signal Selection in Wide-Area Controlled UPFCs for Damping Power System Oscillations", *Power Systems Conference & Exposition (PSCE)*, March 2009, Seattle, Washington, USA.
- 27) M. Zarghami, Mariesa L. Crow, "Damping Inter-Area Oscillations in Power Systems by STATCOMs", *North American Power Symposium (NAPS)*, Sep. 2008, University of Calgary, Calgary, Canada.
- 28) M. Zarghami, Mariesa L. Crow, J. Sarangapani, Yilu Liu, "Damping Inter-Area Oscillations by UPFCs Based on Selected Global Measurements", *Power & Energy Society General Meeting*, July 2008, Pittsburgh, Pennsylvania, USA.
- 29) M. Zarghami, Mariesa L. Crow, "Discussion on Effective Control of Inter-Area Oscillations by UPFCs", *North American Power Symposium (NAPS)*, Sep. 2007, New Mexico State University, USA.
- 30) M. Zarghami, Mariesa L. Crow, "The Effect of Various UPFC Operating Points on Transient Stability", *North American Power Symposium (NAPS)*, Sep. 2006, Southern Illinois University, Carbondale, USA.
- 31) G.K Venayagamoorthy, M. Zarghami, "Wide-Area Power System Protection Using a Learning Vector Quantization Network", *Intelligent Systems Applications to Power Systems (ISAP)*, Nov. 2005, Washington DC, USA.
- 32) M. Zarghami, H. Oraee, "A Frequency-Dependent Root-Matching Scheme in Electromagnetic Transient Analysis", *5th Power Seminar, Shahid Abbaspour University*, 15-17 October 2003, Tehran, IRAN.
- 33) M. Zarghami, H. Oraee, "A Frequency-Dependent Root-Matching Scheme in Electromagnetic Transient Analysis", *IASTED International Conference on Power and Energy Systems (EuroPES 2002)*, 25-28 June 2002, Crete, GREECE.
- 34) B.T. Hosseini, S. Jadid, M. Zarghami, "Alarm Processing in Control Centers by Expert Systems", *14th International Power System Conference (PSC 99)*, 1-3 November 1999, Tehran, IRAN.
- 35) M. Zarghami, G. Monibi, "On-Line Fault Diagnosis in Power Plants Using Artificial Intelligence Methods", *13th International Power System Conference (PSC 98)*, 9-11 November 1998, Tehran, IRAN.