

Curriculum Vitae

Personal Information:

Name Srinivas Bhaskar Karanki

Date of Birth May 16, 1986

Nationality Indian

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Educational Qualification:

Postdoctoral Fellow Ryerson University, Toronto 2012-Present

PhD* Indian Institute of Technology Madras 2007-2012 CPI: 8.97/10
(Power Electronics Application in Power Systems)

Bachelor of Technology Bapatla Engineering College, Bapatla 2003-2007 Agg: 87.2%
(Electrical and Electronics Engineering)

(* Joined as Master of Science Scholar through Gate Rank and converted to PhD. Awarded direct PhD. CPI = Cumulative Performance Index, Agg = Aggregate)

Postdoctoral Experience:

Project Topic System Integration of Large Scale Energy Storage Systems Using Lithium Batteries

Supervisors Dr. David Xu

University Ryerson University, Toronto, Canada

- This Project examines the feasibility of integrating large-scale battery energy storage systems in the Toronto distribution network. The battery system with high efficiency power converters will be studied to provide reliable and uninterrupted energy supply, to smooth skewed consumption pattern (more in day and less in night); and to defer the upgrading cost of consumer appetite for energy in urban areas. The objectives have been formulated with industry partners Hydro One and the systems are studied based on practical data provided by Hydro One.
- The intended deliverables will be to develop high efficient modular converter systems for the battery management system and to develop algorithms for optimal placement and sizing of the battery management system. The proposed algorithm for optimal sizing and

placement has been verified with real time data and the deployment of the algorithm to the actual system is under process. Furthermore, an experimental setup for modular converter system is currently being developed at Ryerson University to verify our proposed algorithms.

Doctoral Experience:

PhD Thesis Topic Topologies and Design of State Feedback Controller for Custom Power Devices in Power Distribution System

Supervisors Prof. Mahesh Kumar and Dr. Kalyan Kumar

University Indian Institute of Technology Madras, Chennai, India

Description

- The thesis aims to design a robust feedback controller for UPQC under parametric variations. The thesis also examined various converter topologies to operate the custom power devices at a reduced DC link voltage without compromising the compensation capabilities of the device. Particle swarm optimization (PSO) based state feedback controller is proposed to improve the performance of the UPQC under parametric variations. The study was performed using simulations in MATLAB and validated with experimental studies.
- A hybrid shunt active filter topology has been proposed with a reduced DC-link voltage rating. This topology has been extended to the UPQC applications. A modified UPQC topology has been proposed, which has the capability to retain the performance of the conventional topologies with a single DC-link capacitor. The study was performed using simulation software PSCAD 4.2.1. A DSP based prototype of the three-phase UPQC has been developed in the laboratory and the proposed concepts are validated with experimental studies.

Publications:

Journal Publications:

1. Srinivas Bhaskar Karanki, Nagesh Geddada, Mahesh K. Mishra, and B. Kalyan Kumar, "A Modified Three-phase Four Wire UPQC Topology with Reduced DC-link Voltage Rating," *IEEE Transactions on Industrial Electronics*, Vol. No. 60, Issue No. 9, Sept. 2013, pp. 3555-3566. (NC: 7, IF : 5.16)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6226856
2. Nagesh Geddada, Srinivas Bhaskar Karanki and Mahesh K. Mishra, "Modified DSTATCOM Topology with Reduced DC Link Voltage for Reactive and Harmonic Power Compensation of unbalanced Nonlinear Load in Distribution System" *International Journal of Emerging Electric Power Systems*, Vol. No. 15, Issue No. 3, 2014, pp. 263-277.

3. Srinivas Bhaskar Karanki, Nagesh Geddada, Mahesh K. Mishra, and B. Kalyan Kumar, "A DSTATCOM Topology with reduced DC link voltage rating for load compensation with Non-stiff source," *IEEE Transaction on Power Electronics*, Vol.no.27, Issue no.3, 2012, pp. 1201-1211. (NC: 19, IF: 4.08)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5978222
4. Srinivas Bhaskar Karanki, Mahesh K. Mishra, and B. Kalyan Kumar, "Particle Swarm Optimization based feedback controller design of Unified Power Quality Conditioner (UPQC)," *IEEE Transaction on Power Delivery*, Vol.no.25, Issue no.4, 2010, pp. 2814 – 2824. (NC: 9, IF:1.519)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5560705
5. B. Kalyan Kumar, Mahesh K. Mishra, Srinivas Bhaskar Karanki and P. Harsha vardhana, "PSO based feedback controller design of DSTATCOM for load compensation with non-stiff sources," *International Journal of Power Electronics*, Vol. 1, No. 2, 2008, pp. 191-205. (NC: 1, IF:1.9)
<http://inderscience.metapress.com/content/7r555196u0473jp0/>

Conference Publications:

1. Srinivas Bhaskar Karanki, and David Xu, "Voltage Droop Control of Dual Active Bridge for Integrating Battery Energy Storage to Utility Grid," accepted for *IEEE Energy Conversion congress and Expo (ECCE) 2014*, Pittsburg, USA.
2. Srinivas Bhaskar Karanki and David Xu, "NPC Based Dual Active Bridge Topology for Integrating Battery Energy Storage to Utility Grid", presented at [IEEE Canadian Conference on Electrical and Computer Conference \(CCECE 2014\)](#), Toronto, Ontario, Canada.
3. Srinivas Bhaskar Karanki, David Xu, Bala Venkatesh and Bob Singh, "Optimal Location of Battery Energy Storage Systems in Power Distribution Network for Integrating Renewable Energy Sources," in *IEEE Energy Conversion congress and Expo (ECCE) 2013*, Sep. 14-29, 2013, Denver, Colorado, USA.
4. Nagesh Geddada, Srinivas Bhaskar Karanki and Mahesh K. Mishra "Synchronous reference frame based current controller with SPWM switching strategy for DSTATCOM applications" in *International Conference on Power Electronics, Drives and Energy Systems (PEDES) 2012*, Dec. 16-19, 2012, India
5. Srinivas Bhaskar Karanki, Nagesh. G, B. Kalyan Kumar, and Mahesh K Mishra, "Comparison of Various Voltage Source Inverter Based UPQC Topologies," in *International conference on power and energy systems (ICPS) 2011*, Dec. 22-24, 2011, India.
6. Nagesh. G, Srinivas Bhaskar Karanki, Mahesh K. Mishra and B. Kalyan Kumar, "Modified Four Leg DSTATCOM Topology for Compensation of Unbalanced and

Nonlinear Loads in Three Phase Four Wire System,” in *14th European Conference on Power Electronics and Applications 2011 (EPE 2011)*, Aug. 30 - Sept. 1 2011, London, United Kingdom. (NC-1)

7. Srinivas Bhaskar Karanki, Nagesh. G, B. Kalyan Kumar, and Mahesh K Mishra, “A Hybrid Topology for Reducing DC Link Voltage Rating in DSTATCOM Applications,” in *IEEE Energy Tech-2011*, May 25-26, 2011, USA. (NC-1)
8. Srinivas Bhaskar Karanki, B. Kalyan Kumar and Mahesh K. Mishra, “Robust controller for unified power quality conditioner,” in *7th R&D International Conf. on Development and Management of Water and Energy*, Bhubneshwar, Orissa, Feb. 4-6, 2009.
9. S. Srikanthan, Srinivas Bhaskar Karanki and Mahesh K. Mishra, “Capacitor voltage balancing in neutral clamped inverters for DSTATCOM application,” in *2nd International Conference on Power Engineering, Energy and Electrical Drives (POWERENG 2009)* Lisbon Portugal, held in March 18-20, 2009. (NC-5)
10. N. Karthikeyan, Srinivas Bhaskar Karanki and Mahesh K. Mishra “Power Quality Survey in a Technological Institute,” in *Third International Conference on Power Systems (ICPS 2009)* held at IIT Kharagpur, India, 27-29 December 2009. (NC-1)

Teaching Experiences:

Teaching assistant at Indian Institute of Technology Madras between August 2007 and April 2012 for the following courses and laboratories.

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| 1) Power quality and reliability | 3) High voltage power transmission |
| 2) Control Systems | 4) Advanced power system Laboratory I and II |

Awards:

- 1) POSOCO Power System Award (PPSA 2013) for the PhD Thesis by power system operation corporation and Foundation for innovation and technology transfer, New Delhi, India.

Conference talks:

- 1) Presented paper in IEEE Energy Conversion Congress and Expo 2013 at, Denver, Colorado, USA.
- 2) Presented paper in IEEE Energy Tech 2011 conferences at Cleveland, USA jointly organized by IEEE Cleveland section and NASA Cleveland Section.
- 3) Presented paper in 2nd International Conference on Power Engineering, Energy and Electrical Drives 2009 at Lisbon, Portugal.
- 4) Presented papers in ICPS 2011 at IIT madras and in 7th R & D International Conf. on Development and Management of Water and Energy, Bhubneshwar, India.

Other Activities:

- 1) Held the position of Research Affairs Secretary (RAS) for the academic year 2010-2011 in IIT Madras (Elected among 3000 Research Scholars on campus).
- 2) Reviewer for IEEE Transactions on Industrial Electronics, IEEE Transactions on Power Systems and IET Transactions on Power Electronics

I declare that the above details are true to the best of my knowledge and belief.

Date: July 14th, 2014

Srinivas Bhaskar Karanki