

Dr. Behrooz Bahrani
Electrical and Computer Systems Engineering
Email: Behrooz.Bahrani@monash.edu



Biography

Behrooz Bahrani received the B.Sc. degree from Sharif University of Technology, Tehran, Iran, the M.Sc. degree from the University of Toronto, Toronto, ON, Canada, and the Ph.D. degree from the Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland, all in electrical engineering, in 2006, 2008, and 2012, respectively.

From September 2012 to September 2015, he was a Postdoctoral Fellow at several institutions including EPFL, Purdue University, West Lafayette, IN, USA, Georgia Institute of Technology, Atlanta, GA, USA, and Technical University of Munich, Munich, Germany. His research interests include control of power electronics systems, applications of power electronics in power and traction systems, and grid integration of renewable energy resources.

Behrooz Bahrani received the Swiss National Science Foundation Early Postdoc.Mobility Fellowship in 2013, and the Swiss National Science Foundation Advanced Postdoc.Mobility Fellowship in 2014.

Employment

Senior Lecturer

Electrical and Computer Systems Engineering

MONASH UNIVERSITY

5 Oct 2015 → present

Qualifications

Research output

Nonlinear transient stability analysis of Phased-Locked Loop based grid-following Voltage Source Converters using Lyapunov's direct method

Mansour, M. Z., Me, S. P., Hadavi, S., Badrazadeh, B., Karimi, A. & Bahrani, B., Jun 2022, In: IEEE Journal of Emerging and Selected Topics in Power Electronics. 10, 3, p. 2699-2709 11 p.

A robust exciter controller design for synchronous condensers in weak grids

Hadavi, S., Rathnayake, D., Jayasinghe, S. G., Mehrizi-Sani, A. & Bahrani, B., May 2022, In: IEEE Transactions on Power Systems. 37, 3, p. 1857-1867 10 p.

Adaptive virtual resistance for post-fault oscillation damping with grid-forming control

Me, S. P., Zabihi, S., Blaabjerg, F. & Bahrani, B., Apr 2022, In: IEEE Transactions on Power Electronics. 37, 4, p. 3813-3824 12 p.

Generalized virtual synchronous generator control design for renewable power systems

Rathnayake, D., Razzaghi, R. & Bahrani, B., Apr 2022, In: IEEE Transactions on Sustainable Energy. 13, 2, p. 1021-1036 16 p.

Linear Parameter-Varying control of a power-synchronized grid-following inverter

Mansour, M. Z., Ravanji, M. H., Karimi, A. & Bahrani, B., Apr 2022, In: IEEE Journal of Emerging and Selected Topics in Power Electronics. 10, 2, p. 2547-2558 12 p.

Small-signal synchronization stability enhancement of grid-following inverters via a feedback linearization controller

Zarif Mansour, M., Ravanji, M. H., Karimi, A. & Bahrani, B., 9 Feb 2022, (Accepted/In press) In: IEEE Transactions on Power Delivery. 10 p.

Electromagnetic oscillation origin location in multiple-inverter-based power systems using components impedance frequency responses

Zhou, W., Torres-Olguin, R. E., Zadeh, M. K., Bahrani, B., Wang, Y. & Chen, Z., 17 Dec 2021, In: IEEE Open Journal of the Industrial Electronics Society. 2, 20 p., 9296957.

Estimation of non-synchronous inertia in AC microgrids

Phurailatpam, C., Rather, Z. H., Bahrani, B. & Doolla, S., Oct 2021, In: IEEE Transactions on Sustainable Energy. 12, 4, p. 1903-1914 12 p.

Grid forming inverter modeling, control, and applications

Rathnayake, D. B., Akrami, M., Phurailatpam, C., Me, S. P., Hadavi, S., Jayasinghe, G., Zabihi, S. & Bahrani, B., 13 Aug 2021, In: IEEE Access. 9, p. 114781-114807 27 p.

Power-synchronized grid-following inverter without a phase-locked loop

Bahrani, B., 5 Aug 2021, In: IEEE Access. 9, p. 112163-112176 14 p.

Frequency response of motor drive loads in microgrids

Ryan, D. J., Torresan, H. D., Razzaghi, R. & Bahrani, B., Jun 2021, In: IEEE Transactions on Energy Conversion. 36, 2, p. 1197-1206 10 p.

Decentralized voltage regulation and energy management of integrated DC Microgrids into AC power systems

Nabatirad, M., Razzaghi, R. & Bahrani, B., Apr 2021, In: IEEE Journal of Emerging and Selected Topics in Power Electronics. 9, 2, p. 1269-1279 11 p.

Grid-supporting battery energy storage systems in islanded microgrids: a data-driven control approach

Ryan, D. J., Razzaghi, R., Torresan, H. D., Karimi, A. & Bahrani, B., Apr 2021, In: IEEE Transactions on Sustainable Energy. 12, 2, p. 834-846 13 p.

Optimal allocation and sizing of Synchronous Condensers in weak grids with increased penetration of wind and solar farms

Hadavi, S., Mansour, M. Z. & Bahrani, B., Mar 2021, In: IEEE Journal on Emerging and Selected Topics in Circuits and Systems. 11, 1, p. 199-209 11 p.

Effects of alternating current on Li-ion battery performance: monitoring degradative processes with in-situ characterization techniques

Ghassemi, A., Chakraborty Banerjee, P., Hollenkamp, A. F., Zhang, Z. & Bahrani, B., 15 Feb 2021, In: Applied Energy. 284, 16 p., 116192.

Harmonic and interharmonic phasor estimation using Matrix Pencil Method for phasor measurement units

Bernard, L., Goondram, S., Bahrani, B., Pantelous, A. & Razzaghi, R., 15 Jan 2021, In: IEEE Sensors Journal. 21, 2, p. 945-954 10 p., 9142233.

Energy-efficient speed control of electric vehicles: linear matrix inequality approach

Veysi, M., Aghaei, J., Shasadeghi, M., Razzaghi, R., Bahrani, B. & Ryan, D. J., Oct 2020, In: IEEE Transactions on Vehicular Technology. 69, 10, p. 10469-10483 15 p.

Measurement-based estimation of inertia in AC microgrids

Sharma, P. C., Rather, Z., Bahrani, B. & Doolla, S., Jul 2020, In: IEEE Transactions on Sustainable Energy. 11, 3, p. 1975-1984 10 p., 8876680.

Arm-sensorless sub-module voltage estimation and balancing of modular multilevel converters

Didarul Islam, M., Razzaghi, R. & Bahrani, B., 1 Apr 2020, In: IEEE Transactions on Power Delivery. 35, 2, p. 957-967 11 p.

Decentralized voltage regulation in islanded DC microgrids in the presence of dispatchable and non-dispatchable DC sources

Nabatirad, M., Razzaghi, R. & Bahrani, B., 2020, *2020 22nd European Conference on Power Electronics and Applications (EPE'20 ECCE Europe)*. Bosga, S. (ed.). Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 1-10 10 p. (2020 22nd European Conference on Power Electronics and Applications, EPE 2020 ECCE Europe).

Stability analysis and nonlinear control of Phase Locked Loop of a weak-grid connected Voltage Source Converter

Mansour, M. Z., Hadavi, S. & Bahrani, B., 2020, *2020 Fifteenth International Conference on Ecological Vehicles and Renewable Energies (EVER)*. Masmoudi, A. (ed.). Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, 6 p. 9243004

Decentralized secondary controller in islanded DC microgrids to enhance voltage regulation and load sharing accuracy

Nabatirad, M., Bahrani, B. & Razzaghi, R., 4 Jul 2019, *Proceedings - 2019 IEEE International Conference on Industrial Technology (ICIT)*. Luque, A., Gomes, L., Han, Q-L. & Sokolowski, P. (eds.). Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 1692-1697 6 p.

Deterioration of frequency response in low inertia networks due to governor dead-bands

Rathnayake, D. B., Razzaghi, R. & Bahrani, B., 4 Jul 2019, *Proceedings - 2019 IEEE International Conference on Industrial Technology (ICIT)*. Luque, A., Gomes, L., Han, Q-L. & Sokolowski, P. (eds.). Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 1698-1703 6 p.

Aging effects of twice line frequency ripple on lithium iron phosphate (LiFePO₄) batteries

Ghassemi, A., Banerjee, P. C., Zhang, Z., Hollenkamp, A. & Bahrani, B., 2019, *2019 21st European Conference on Power Electronics and Applications (EPE '19 ECCE Europe)*. Lataire, P. (ed.). Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 1326-1334 8 p.

Optimized renewable energy use in green cloud data centers

xU, M., N. Toosi, A., Bahrani, B., Razzaghi, R. & Singh, M., 2019, *Service-Oriented Computing: 17th International Conference, ICSOC 2019 Toulouse, France, October 28–31, 2019 Proceedings*. Yangui, S., Bouassida Rodriguez, I., Drira, K. & Tari, Z. (eds.). Cham Switzerland: Springer, p. 314-330 17 p. (Lecture Notes in Computer Science ; vol. 11895).

Reduced Capacitance Battery Storage DC-Link Voltage Regulation and Dynamic Improvement Using a Feed-Forward Control Strategy

Bazargan, D., Bahrani, B. & Filizadeh, S., 1 Dec 2018, In: *IEEE Transactions on Energy Conversion*. 33, 4, p. 1659 - 1668 10 p.

A Bi-Directional Series Z-Source Circuit Breaker

Ryan, D. J., Torresan, H. D. & Bahrani, B., 1 Sep 2018, In: *IEEE Transactions on Power Electronics*. 33, 9, p. 7609-7621 13 p.

A buck converter with integrated circuit breaker

Kwen Chong, J. Y., Ryan, D. J., Torresan, H. D. & Bahrani, B., 2018, *Proceedings - 2018 IEEE 27th International Symposium on Industrial Electronics (ISIE)*. Ibrahim, Y. (ed.). Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 299-304 6 p.

The impact of source and fault impedance on post-fault response of z-source circuit breakers

Ryan, D. J. & Bahrani, B., 6 Nov 2017, *2017 19th European Conference on Power Electronics and Applications, EPE 2017 ECCE Europe*. IEEE, Institute of Electrical and Electronics Engineers, Vol. 2017-January. 10 p. 8099308

Circulating current suppression of the modular multilevel converter in a double-frequency rotating reference frame

Bahrani, B., Debnath, S. & Saeedifard, M., Jan 2016, In: *IEEE Transactions on Power Electronics*. 31, 1, p. 783-792 10 p., 7046433.

Indirect finite control set model predictive control of modular multilevel converters

Vatani, M., Bahrani, B., Saeedifard, M. & Hovd, M., May 2015, In: *IEEE Transactions on Smart Grid*. 6, 3, p. 1520-1529 10 p., 6990622.

Operation, control, and applications of the modular multilevel converter: a review

Debnath, S., Qin, J., Bahrani, B., Saeedifard, M. & Barbosa, P., Jan 2015, In: IEEE Transactions on Power Electronics. 30, 1, p. 37-53 17 p.

High-order vector control of grid-connected voltage-source converters with LCL-filters

Bahrani, B., Vasiladiotis, M. & Rufer, A., Jun 2014, In: IEEE Transactions on Industrial Electronics. 61, 6, p. 2767-2775 9 p.

Multivariable control of single-inductor dual-output buck converters

Dasika, J. D., Bahrani, B., Saeedifard, M., Karimi, A. & Rufer, A., Apr 2014, In: IEEE Transactions on Power Electronics. 29, 4, p. 2061-2070 10 p.

Modular converter architecture for medium voltage ultra fast EV charging stations: dual half-bridge-based isolation stage

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A cascade voltage controller for three-phase islanded microgrids

Bahrani, B. & Rufer, A., 2013, *2013 IEEE Power and Energy Society General Meeting, PES 2013: Vancouver, British Columbia, Canada; 21-25 Jul 2013*. Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 4088-4093 6 p. 6673060

A multivariable design methodology for voltage control of a single-DG-unit microgrid

Bahrani, B., Saeedifard, M., Karimi, A. & Rufer, A., 2013, In: IEEE Transactions on Industrial Informatics. 9, 2, p. 589 - 599 11 p.

Decoupled dq-current control of grid-tied voltage source converters using nonparametric models

Bahrani, B., Karimi, A., Rey, B. & Rufer, A., 2013, In: IEEE Transactions on Industrial Electronics. 60, 4, p. 1356 - 1366 11 p.

Multivariable control of Single-Inductor Dual-Output buck converters

Bahrani, B., Dasika, J. D., Saeedifard, M., Karimi, A. & Rufer, A., 2013, *28th Annual IEEE Applied Power Electronics Conference and Exposition, APEC 2013: Long Beach, CA, United States; 17-21 March 2013*. Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 1103-1108 6 p. 6520437

Optimization-based voltage support in traction networks using active line-side converters

Bahrani, B. & Rufer, A., 2013, In: IEEE Transactions on Power Electronics. 28, 2, p. 673 - 685 13 p.

Catenary voltage support: Adopting modern locomotives with active line-side converters

Bahrani, B., Rufer, A. & Aeberhard, M., 2012, In: IEEE Transactions on Smart Grid. 3, 1, p. 377 - 387 11 p.

Model predictive-based voltage regulation of an islanded distributed generation unit

Bahrani, B. & Rufer, A., 2011, *IEEE Energy Conversion Congress and Exposition: Energy Conversion Innovation for a Clean Energy Future, ECCE 2011, Proceedings: Phoenix, AZ, United States; 17-22 September 2011*. Piscataway NJ USA: IEEE, Institute of Electrical and Electronics Engineers, p. 465-472 8 p. 6063806

Multivariable-PI-based dq current control of voltage source converters with superior axis decoupling capability

Bahrani, B., Kenzelmann, S. & Rufer, A., 2011, In: IEEE Transactions on Industrial Electronics. 58, 7, p. 3016 - 3026 11 p.

Nondetection zone assessment of an active islanding detection method and its experimental evaluation

Bahrani, B., Karimi, H. & Iravani, R., 2011, In: IEEE Transactions on Power Delivery. 26, 2, p. 517 - 525 9 p.

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Stability analysis and experimental evaluation of a control strategy for islanded operation of distributed generation units

Bahrani, B., Karimi, H. & Iravani, R., 2011, In: *IEEEJ Transactions on Industry Applications*. 131, 8, p. 1013-1022 10 p.

Vector control of single-phase voltage-source converters based on fictive-axis emulation

Bahrani, B., Rufer, A., Kenzelmann, S. & Lopes, L. A. C., 2011, In: *IEEE Transactions on Industry Applications*. 47, 2, p. 831 - 840 10 p.

Stability analysis and experimental validation of a control strategy for autonomous operation of distributed generation units

Bahrani, B., Karimi, H. & Iravani, R., 2010, *2010 International Power Electronics Conference - ECCE Asia -, IPEC 2010: Sapporo, Japan; 21-24 June 2010*. Piscataway, NJ, USA: IEEE, Institute of Electrical and Electronics Engineers, p. 464-471 8 p. 5543537

Decentralized control of parallel connection of two distributed generation units

Bahrani, B., Karimi, H. & Iravani, R., 2009, *Proceedings - IECON 2009, 35th Annual Conference of the IEEE Industrial Electronics Society*. p. 358-362 5 p. 5414948

Investigation of harmonic filtering for the state-of-the-art variable speed drives

Bahrani, B. & Grinberg, R., 2009, *2009 13th European Conference on Power Electronics and Applications, EPE '09*. 5279191