CURRICULUM VITAE

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1. Personal Information

Abbas A. Fardoun, Associate Professor
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a. Educational Background

Ph.D. in Electrical Engineering, August 1994.
University of Colorado, Boulder, Colorado, USA.
Ph.D. Thesis: A Novel Wind Power Train: Permanent-Magnet Generator with Flux Weakening Feeding a Controlled Real/Reactive Power Inverter.

Master of Science in Electrical Engineering, August 1990.
University of Colorado, Boulder, Colorado, USA.
Master's Thesis: Simulation of Inverter-Motor System for Hybrid Vehicles Using SPICE.

Bachelor of Science in Electrical Engineering May 1988.
University of Houston, University Park, Houston, Texas, USA.

b. Professional Experience

Associate Professor 2006-present
UAE University
Al-Ain, UAE

Senior Technical Staff Engineer 2000-2006
TRW Automotive, Chassis Division
34201 Van Dyke Ave.
Sterling Heights, MI 48311

Staff Engineer, June 1998 – May 2000
TRW Automotive, Electronics Division
24175 Research Dr.
Farmington Hills, MI 48335

Senior Project Engineer, November 1996– June 1998
GM/ (Delphi Division), Saginaw Steering Systems World Headquarters
3900 Holland Road, Saginaw, MI 48601

Design Engineer, October 1994, November 1996
Advanced Energy Inc.
1625 Sharp Point St., Fort Collins, CO 80525

2. Industrial Projects

1. TRW

i. Technical Manager for GENII EPS Column Drive EPS for Renault platform
ii. System architecture for EPS Rack Drive system (1st Rack Drive system to be in Production)
iii. Fault tree analysis for EPS Rack Drive System
iv. Developed boundary block diagram for belt drive EPS for fault analysis and diagnostics.
v. Technical Manager for EPS Column Drive launched in Korea
vi. Technical Lead for GM 42V Prototype Rack Drive EPS
vii. Algorithm and hardware design to use EPS as anti-theft device
viii. Methodology to track requirements vs. capability for EPS system
ix. System sizing approach for EPS system that was used globally by TRW
x. Developed system specification for1st rack drive EPS system to be in production.
xi. Algorithm for thermal sensing fault detection
xii. Motor torque ripple and noise reduction
xiii. Involved at different capacities with projects for Ford, GM, Renault and Hyundai (Mobis).

2. Delphi

i. Team Design Leader for Sinusoidal Electrical Power Steering Controller
ii. Algorithms for diagnostics for EPS system and subsystems (sensors, controller...etc.)
iii. Design and development of a PWM controller for Electrical Power Steering System.
iv. Analysis and algorithm for sizzle noise in EPS system.
v. Motor Control algorithm to compensate for temperature change on motor parameters
vi. Algorithm, design and system constraints to decrease Electro Magnetic interference in a vehicle by EPS system.
vii. Development of a look-up table control strategy for a sinusoidal Electrical Power Steering System (EPS).
viii. Torque-ripple minimization for AC drives in EPS system.

3. Advanced Energy

i. Design and implementation of new Tuner algorithm for load matching.
ii. Design for high power factor correction (PFC) AC/DC supply.
iii. High frequency magnetic design.
iv. Algorithm, design, analysis and development of wide bandwidth power measurement circuit with 1% accuracy for SMPS.

3. Research, Scholarly, and Creative Activities.

a. Patents

i- AWARDED PATENTS

1. Connel Bret Williams, Jeffrey Ronald Coles, Adrian Szabo, Christopher David Dixon, Jiang Li, & Abbas Ahmad Fardoun, "Motor drive control with a single current sensor using space vector technique", **patent # US 7,612,522**, November 2009.
2. Connel Bret Williams, Jeffrey Ronald Coles, Adrian Szabo, Christopher David Dixon, Jiang Li, & Abbas Ahmad Fardoun, "Motor drive control with a single current sensor using space vector technique", **patent # US 7,308,192**, December 2007.
3. Abbas A. Fardoun & Joseph Miller, "Method and apparatus for detecting a failed temperature sensor in an electric assist steering system", **Patent # US 7,163,080**, January 2007.
4. Abbas A. Fardoun, Joseph Miller, Jim Loria and Hemant Sardar, "Utilization of Electrical Power Steering System as antitheft Device", **Patent # US 6,889,792**, TRW, May 2005.
5. Hemant Sardar and Abbas A. Fardoun, "Method and Apparatus for Determining Motor Faults in an Electric Assist Steering System", **Patent # US 6,731,085**, TRW, May 2004.
6. Abbas A. Fardoun, Luke Comstock and Heritianarisoa Rakouth, "Reduction of EMI through Switching Dithering", **Patent # US 6,674,789**, Delphi Technologies Inc., January 2004.
7. Sayeed A. Mir, Abbas A. Fardoun and Shaotang Chen, "An Adaptive Method to Compensate for the Resistance Variations During the Operation of Voltage Mode Controlled PM Machine", **Patent # US 6,411,052**, Delphi Technologies Inc., June 2002.

ii. Invention Disclosures

1. S. Sarllito, T. Thornton, A. A. Fardoun and L. A. Manke, "New Capacitive Sensor Technology for Position-sensing of a Transfer Case Application", Invention Disclosure, TRW, September 1999.
2. Fardoun and L. A. Manke, "Triplen Harmonic Injection for the increased power efficiency in Permanent-Magnet AC (PMAC) Steering System", Invention Disclosure, TRW, April 1999.
3. A. Fardoun and T. Sebastian, "Starting and indexing sinusoidal steering system using one hall and 2 high resolution signals." Invention Disclosure, # H203127, May 1998.
4. E. F. Fuchs and A. A. Fardoun, "Architecture of a Variable-Speed, Direct Transmission Wind Power Plant of Wind-Farm Size", Invention Disclosure, University of Colorado, February 1994.

b. Books

Mohammad O. Hamdan, Hassan Hejase, Hassan Noura and Abbas A. Fardoun, "ICREGA'14 -Renewable Energy: Generation and Application", Proceedings of the 3rd International Conference on Renewable Energy: Generation and Applications, Springer, 2014.

c. Articles in Refereed Journals.

1. Ahmed Al-Gabri, Abbas A. Fardoun and Esam H. Ismail," Bridgeless PFC SEPIC Rectifier with extended Gain for Universal Input Voltage Applications", ***IEEE Transactions on Power Electronics*****,** ***Accepted***, DOI:10.1109/TPEL, 2014.

2. R. Salim, H. Noura, M. Nabag and A. Fardoun "The Parameter Identification of The Nexa 1.2kW PEMFC's Model Using Particle Swarm Optimization", ***Elsevier Journal on Renewable Energy***, ***Accepted***, September 2014.

3. Ala A. Hussein and Abbas A. Fardoun, "Design Considerations and Performance Evaluation of Outdoor PV Battery Chargers in UAE", ***Elsevier Journal on Renewable Energy***, ***Accepted***, DOI: 10.1016/j.renene.2014.08.063, 2014.

4. S. Al-Zuhair, A. A. Fardoun, M. Nour, and A. Abdulrazak, "Renewable Energy Education for Engineering Freshman Students", ***Asian Journal of Education and e-Learning*** (ISSN: 2321 – 2454), Vol. 2, no. 3, June 2014.

5. Abbas A. Fardoun, Nasrullah Khraim, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "Bridgeless High Power Factor Buck-Converter Operating in Discontinuous Capacitor Voltage Mode", ***IEEE Transactions on Industrial Applications***, Vol. 50, no. 5, pp. 3457–3467, Sept. 2014.

6. Abbas A. Fardoun, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "Bridgeless Resonant Pseudo Boost PFC Rectifier", ***IEEE Transactions on Power Electronics*****,** vol. 29, no. 11, pp. 5949-5960, Nov. 2014.

7. Ensiyeh Keshtkaran, Abbas A. Fardoun and Hassan Noura," Employing Hydrogen Fuel Cell in Hybrid Energy Systems for Stand-Alone, Off-Grid Remote Sites in UAE", *Journal of Renewable Energy & Power Quality Journal (RE&PQJ),* No.12, April 2014.

8. Abbas A. Fardoun and Esam H. Ismail, "Bidirectional Converter for High-efficiency Fuel Cell Powertrain", ***Elsevier Journal of Power Sources*****,** Vol. 249, pp. 470-482, January 2014.

9. Esam H. Ismail, Abbas A. Fardoun, and Adel A. Zerai, "Step-up/step-down DC-DC converter with near zero input/output current ripples", ***International Journal of Circuit Theory and Applications***, vol. 42, pp. 358-375, 2014.

10. Aysha K. AL-Kaabi, Abbas A. Fardoun, and Esam H. Ismail, "Bridgeless High Voltage Battery Charger PFC Rectifier," ***Elsevier Journal on Renewable Energy***, vol. 56, pp. 24-31, 2013.

11. Abbas A. Fardoun, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "A Comparison between Three Proposed Bridgeless Cuk Topologies and Conventional Topologies for Power Factor Correction," ***IEEE Transactions on Power Electronics*****,** Vol. 27, no. 7, pp. 3292-3301**,** July 2012.

12. Sulaiman Al-Zuhair, Hassan Noura and Abbas Fardoun, "Utilization of Date-pits in Transformer Oil Chemical Regeneration", ***International Journal of Sustainable Energy Development***, Volume 1, Issue 1,pp. 46-50, June, 2012.

13. Okba Zoubeidi, Abbas A. Fardoun, Hassan Noura and Chem Nayar, "'Hybrid Renewable Energy Solution for Safari Camps", *GJTO, Global Journal of Technology and Optimization,* Vol. 3, pp 115-120, June 2012.

14. Ahmad J. Sabzali, Esam H. Ismail, Mustafa A. Al-Saffar, and Abbas A. Fardoun, "A New Bridgeless PFC Sepic and Cuk Rectifiers with Low Conduction and Switching Losses", ***IEEE Transactions on Industrial Applications,*** Vol. 47, no. 2, pp. 873-881**,** January 2011.

15. Abbas A. Fardoun & Esam H. Ismail, "Non-isolated Single Stage PFC Rectifier for Wide-Input Large Step-Down**",** ***International Journal on Power Electronics***, vol. 2, no. 4, pp. 412-427, 2010.

16. Abbas A. Fardoun & Esam H. Ismail, "Ultra Step-Up DC-DC Converter with Reduced Switch Stress", ***IEEE Transactions on Industrial Applications***, Vol. 46, no. 5, pp. 2025-2034, September, 2010.

17. Abbas A. Fardoun & Esam H. Ismail," Reduction of EMI in AC Drives through Dithering within Limited Switching Frequency Range**",** ***IEEE Transactions on Power Electronics,*** Vol.24, no. 3, pp. 804-811 March 2009.

18. Rakib Islam, Iqbal Husain, Abbas Fardoun & Kevin McLaughlin, "Permanent Magnet Synchronous Motor Magnet Designs with Skewing for Torque Ripple and Cogging Torque Reduction", ***IEEE Transactions on Industrial Applications***, Vol. 45, no. 1, pp. 152-160, January 2009.

19. Mustafa A. Al-Saffar, Esam H. Ismail, Ahmad J. Sabzali and Abbas A. Fardoun, "An Improved Topology of SEPIC Converter with Reduced Output Voltage Ripple", ***IEEE Transactions on Power Electronics,*** Vol. 23, no. 5, pp. 2377-2386, September 2008.

20. Esam H. Ismail, Mustafa A. Al-Saffar, Ahmad J. Sabzali, and Abbas A. Fardoun, "A Family of Single-Switch PWM Converters with High Step-Up Conversion Ratio", ***IEEE Transactions on Circuits and Systems-I***, Vol. 55, no. 4, pp. 1159-1171, May 2008.

21. Wenzhe Lu, Ali Keyhani and Abbas Fardoun, "Neural Network Based Modeling & Parameter Identification of Switched Reluctance Motors", ***IEEE Transactions on Energy Conversion,*** Vol. 18, no. 2, pp. 284-290, June 2003.

22. Abbas A. Fardoun, Ewald F. Fuchs and M. A. S. Masoum, " Experimental Analysis of a DC Bucking Motor Blocking Geomagnetically Induced Currents**",** ***IEEE Transactions on Power Delivery***, Vol. 9, no. 1, pp. 88-99, January 1994.

23. Abbas A. Fardoun, Ewald F. Fuchs and Hao Huang, " Modeling and Simulation of an Electronically Commutated Permanent-Magnet Machine Drive System Using SPICE", ***IEEE Transactions on Industrial Applications,*** Vol. 30, No. 4, pp. 927-937, July/August, 1994.

d. Other Professional Papers and Talks, Abstracts, Presented at Conferences

i. Refereed conference proceedings.

1. Ahmed Al-Gabri, Abbas A. Fardoun and Esam H. Ismail," Bridgeless PFC SEPIC Rectifier with extended Gain for Universal Input Voltage Applications", *IEEE Industry Electronics conference IECON*, Dallas, October 2014.

2. Ahmed Al-Gabri, Abbas A. Fardoun and Esam H. Ismail," Modelling and Simulation of Bridgeless PFC modified SEPIC Rectifier with Multiplier Cell", *International IEEE Energy Conversion Congress and Exposition*, Pittsburg, September 2014.

3. M. Nabag, A. Fardoun, H. Hejase, and A. Al-Marzouqi, "Review of Dynamic Electric Circuit Models for PEM Fuel Cells," *The 3rd International Conference on Renewable Energy: Generation and Applications (ICREGA 2014)*, Al-Ain, UAE, March 2-5, 2014.

4. R. Salim, M. Nabag, H. Noura and A. Fardoun, "Dynamic Modeling of PEM Fuel Cell Using Particle Swarm Optimization", *The 3rd International Conference on Renewable Energy: Generation and Applications (ICREGA 2014*), Al-Ain, UAE, March 2-5, 2014.

5. Alaa N. Hail, Boshra A. Alshujaa, Waad K. Albeiey, Ala A. Hussein and Abbas A. Fardoun "Design Considerations of Digitally Controlled PV Battery Chargers", *the 3rd International Conference on Renewable Energy Generation and Application (ICREGA'14*), Al Ain, UAE, March 2-5, 2014.

6. Ensiyeh Keshtkaran, Abbas A. Fardoun and Hassan Noura," Employing Hydrogen Fuel Cell in Hybrid Energy Systems for Stand-Alone, Off-Grid Remote Sites in UAE", *International Conference on Renewable Energies and Power Quality (ICREPQ'14),* Cordoba-Spain, April 2014

7. Zahi M. Omer, Ahmed M. Al-Ameri, Abbas A. Fardoun and Ala A. Hussein, " Comparison of Discharge Performance of 12V/150Ah Gel and AGM Sealed Lead-acid Batteries in Stand-alone PV-based Systems in UAE", *International Conference on Renewable Energies and Power Quality (ICREPQ'14),* Cordoba-Spain, April 2014.

8. R. Salim, H. Noura, A. Fardoun, "A review on fault diagnosis tools of the proton exchange Membrane Fuel Cell", *International Conference on Control and Fault-Tolerant Systems (SysTol)*, France, October 2013.

9. Abbas A. Fardoun, Nasrullah Khraim, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "Bridgeless High Power Factor Buck-Converter Operating in Discontinuous Capacitor Voltage Mode", *IEEE Energy Conversion Congress and Exposition*, Phoenix, pp.5328-5334, September 2013.

10. Nasrullah Khraim, Abbas A. Fardoun and Esam H. Ismail," Large and Small Signal Analysis for Bridgeless High PFC Converter Operating in DCVM", *International Conference on Renewable Energies and Power Quality (ICREPQ'13),* Bilbao-Spain, March 2013.

11. R. Salim, H. Noura, A. Fardoun, " Parameter Identification of 3kW PEM Fuel Cell System for Domestic Use in the UAE Using Genetic Algorithms", *Proceedings of the IEEE 4th International Conference on Power Engineering*, Energy and Electrical Drives, Istanbul – Turkey, 2013.

12. R. Salim, H. Noura, A. Fardoun, "A Parameter Identification Approach Of A PEM Fuel Cell Stack Using Particle Swarm Optimization", Proce*edings of the ASME 2013 11th*

Fuel Cell Science, Engineering and Technology Conference, Minneapolis – MN, USA, 2013.

13. Abbas A. Fardoun, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "New "Real" Bridgeless High Efficiency AC-DC Converter", 27th annual *IEEE Applied Power Electronics Conference (APEC)*, Orlando, pp. 317-323 Feb. 2012.

14. Sulaiman Al-Zuhair, Hassan Noura and Abbas Fardoun, "Using Activated Carbon from Waste Date-pits as an Adsorbent for Transformer Oil Regeneration", *The World Congress of Sustainable Technology WCST2011*, London , UK, November, 2011.

15. Abbas A. Fardoun, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "Bi-Directional Converter with Low Input/Output Current Ripple for Renewable Energy Applications", *IEEE Energy Conversion Congress and Exposition*, Phoenix, pp.3322-3329, September 2011.

16. Okba Zoubeidi, Abbas Ahmed Fardoun, Hassan Noura and Chem Nayar, "'Hybrid Renewable Energy Solution for Safari Camps", *The fifth Global Conference on Power Control and Optimization PCO*, Dubai, 1-3 June 2011.

17. Aysha Kemadish AL-Kaabi, Abbas A. Fardoun and Esam H. Ismail, Bridgeless Step/Up Unity Power Factor Rectifier for High Voltage applications, *The International Conference on Sustainable Systems and the Environment ISSE'11* , Sharjah, March 23-24, 2011.

18. Okba Zoubeidi, Abbas Ahmed Fardoun, Hassan Noura and Chem Nayar, "'Hybrid Renewable Energy Solution for Safari Camps", IEEE International Energy conference and Exhibition (EnergyCon), pp 244-249, December, 2010.

19. Abbas A. Fardoun, Esam H. Ismail, Ahmad J. Sabzali and Mustafa A. Al-Saffar, "A Comparison between Three Proposed Bridgeless Cuk Topologies and Conventional Topologies for Power Factor Correction," 2nd *IEEE International Conference on Sustainable Energy Technologies, ICEST10,* Sri-Lanka, December 2010.

20. Esam H. Ismail, Mustafa A. Al-Saffar, Ahmad J. Sabzali, and Abbas A. Fardoun, "High Voltage Gain Single-Switch Non-Isolated DC-DC Converters for Renewable Energy Applications," 2nd *IEEE International Conference on Sustainable Energy Technologies, ICEST10,* Sri-Lanka, December 2010.

21. Muthanna A. Aziz, Hassan Noura, and Abbas Fardoun, "General Fault Diagnostics in Wind Turbines", *18th Mediterranean Conference on Control and Automation*, MED'10, Morocco, pp. 1302 1307, June 2010.

22. Hamood Albahal, Ahmed Algabri, Surour Alarifi, Naji Alsayari, Abbas Fardoun and Khalifa Harib, "Design of a Wheeled Soccer Robot", *ISMA 10, Sharjah*, UAE, pp. 1-6, April 2010.

23. Abbas A. Fardoun & Esam H. Ismail, "Non-isolated Single Stage PFC Rectifier for Wide-Input Large Step-Down", *8th International Conference on Power Electronics & Drives Systems, PEDS 2009*, Taipei, Taiwan, pp. 294-299, November, 2009.

24. Ahmad J. Sabzali, Esam H. Ismail, Mustafa A. Al-Saffar, and Abbas A. Fardoun, "A New Bridgeless PFC Sepic and Cuk Rectifiers with Low Conduction and Switching Losses," *8th International Conference on Power Electronics & Drives Systems*, *PEDS 2009*, pp550-556, November 2009.

25. Abbas Fardoun, Moza Al-Naimi, Reema Al-Zarooni and Hassan Noura, "Fault Diagnostics in Five Phase AC Motors", International Conference on Advances in Computational tools for Engineering Applications, *ACTEA09,* Lebanon, pp. 640-643, July 2009.

26. Hassan Noura, Abbas Fardoun and Abbas Chamseddine,"Fault diagnosis in complex systems", *10th UAEU Research Conference*, April 2009.

27. Abbas A. Fardoun, Hassan Noura, Esam Ismail, Fatima Al-Muhairi, Fatima Darmaki, Layla Al-Neyadi and Walaa Juma ,"Front End Inverter for a UPS system for telecommunication Application", *10th UAEU Research Conference* April 2009.

28. Moza Al-Naimi, Reema Al-Zarooni, Abbas A. Fardoun and Hassan Noura, "A Fault Monitoring Circuit for Five Phase AC Motor", *ICMSAO 09, Sharjah***,** UAE, January 2009.

29. Abbas A. Fardoun & Esam H. Ismail, "Ultra Step-Up DC-DC Converter with Reduced Switch Stress", *IEEE International Conference on Sustainable Energy Technologies, ICEST08*, Singapore, pp. 425-430, November, 2008.

30. Esam H. Ismail & Abbas A. Fardoun, "SEPIC Converter with Zero Input and Output Current Ripple and Intrinsic Voltage Doubler characteristic**",** *IEEE International Conference on Sustainable Energy Technologies, ICEST08*, Singapore, pp. 431-436, November, 2008

31. Abbas Fardoun**,** Mona Hassan, Heba Mohammed & Jalal Jomaah**,** "SOI MOSFET as Potential Replacement of Mechanical Relays in Electrical Systems", *51st IEEE International MWCAS conference*, Knoxville, pp718-721, August 2008.

32. Abbas A. Fardoun Abbas A. Fardoun, Mona K. Hassan, Heba N. Mohammed & Jalal Jomaah, "Replacement of Mechanical Switch with an Electrical one for Low Voltage High Current Applications" *9th UAEU Research Conference*, April 2008.

33. Rakib Islam, Iqbal Husain, Abbas Fardoun & Kevin McLaughlin, "Permanent Magnet Synchronous Motor Magnet Designs with Skewing for Torque Ripple and Cogging Torque Reduction", *IEEE Industrial Application Society annual conference,* New Orleans, pp. 1552-1559, September 2007.

34. Abbas Fardoun, Ali Assi, & Esam Ismail, "Reduction of EMI Through Switching Frequency Dithering", *IEEE International NEWCAS conference (IEEE-MWCAS 2007),* Montreal, pp. 538-541, August 2007.

35. Abbas A. Fardoun, Ewald F. Fuchs and Palmer Carlin, "A Variable-Speed, Direct-Drive Transmission Wind Power Plant", *American Wind Energy Association Conference*, San Francisco, CA, 12-16 July 1993.

36. Abbas A. Fardoun, Ewald F. Fuchs and Hao Huang, " Modeling and Simulation of an Electronically Commutated Permanent-Magnet Machine Drive System Using SPICE", *Proceedings of the IEEE Industry Applications Society Conference*, pp. 439-447, Houston, 1992.

37. Abbas A. Fardoun, Ewald F. Fuchs and Palmer Carlin, "Permanent-Magnet Machines with Flux Weakening", *NASA Technology 2002 Conference*, Washington, D.C., 3-5 December 1992.

38. Ewald F. Fuchs, Abbas A. Fardoun, Palmer Carlin and Robert W. Erickson, "Permanent Magnet Machines with Large Speed Variations", *American Wind Energy Association Conference*, Seattle, 19-23 October, 1992.

39. Abbas A. Fardoun and Ewald F. Fuchs, " Generator Operation of Electronically Commutated Permanent-Magnet Machine Drives", *International Conference on the Evolution and Modern Aspects of Synchronous Machines*, Zurich, Switzerland, August 27-29, 1991.

ii. Invited talks

1. "Tri-energy and renewable energy, solutions and possibilities" 2nd Annual GLOBAL TRI-GENERATION SUMMIT, Dubai October 2014, Dubai.
2. "Research in renewable Energy and Clean Technology in the UAE", 2nd Australia Unlimited MENA – Education and Research Seminar, Dubai, April 2014.
3. "Fuel cell and renewable energy technology applications in UAE", Energy Efficiency for Petroleum Industry Seminar, ADNOC, Abu-Dhabi, October, 2012.
4. "Hybrid Renewable Energy System Solutions For Remote Areas in UAE", International Conference on Rooftop Grid Connected SPV Power Plants, Thiruvananthapuram, Kerala, India, March 2012.
5. "Recent Research Advances in Alternative and Renewable Energy Resources", Energy Security Research Symposium - British Council, Qatar, November 2011.
6. "Minimizing EM emissions in AC Drives through System Solutions", Electrical Engineering Forum, Dubai, May 2009.
7. "Electrical Power Steering", American University at Beirut, February, 2003.

iii. Selective Professional Technical Reports

1. A.A. Fardoun, " Ford CD3xx EPAS Rack Drive Steering System Specifications", TRW Steering, June 2006.
2. A.A. Fardoun, " Renault B-Platform Column Drive Steering System Specifications", TRW, 2004.
3. A.A. Fardoun, "Renault B_PlatForm System Inertia Approximation", TRW Steering, May 2002.
4. A.A. Fardoun, "Flow down of Renault's B&C_PlatForms Vehicle Level Requirements", TRW Steering, May 2002.
5. A.A. Fardoun, "Algorithm & Analysis for Pseudo AC Switching", TRW Steering, March 2002.
6. A.A. Fardoun, "Closed form Phase Advance Optimization", TRW Steering, July 2002.
7. A.A. Fardoun, "PSA M2H-Platform Electrical Steering System Loss estimation", TRW 2001.
8. A.A. Fardoun, "EPS System Resistance Budget & Closed Form Battery Current solution", TRW Steering, July 2000.
9. S. Mir and A. A. Fardoun, "Diagnostic Algorithms and Circuitry for a Sinusoidal Steering System", Delphi Steering, Saginaw, April 1998.

10. A. A. Fardoun, “Discussion on Phase Advance Solutions and its effect on the Controller”, Delphi Steering, Saginaw, March 1998.
11. A. A. Fardoun, “Sine Controller Concept and Design”, Delphi Steering, Saginaw, Delphi Steering, Saginaw, January 1998.
12. A. A. Fardoun, “Loss Analysis of Sinusoidal Versus Trapezoidal Controller”, Delphi Steering, Saginaw, September 1997.
13. A. A. Fardoun, “Improving Bus Capacitors Reliability by actively switching Electrical Power Steering Operating Modes”, Delphi Steering, Saginaw, July 1997.
14. A. A. Fardoun, “New Tuner Algorithm for Digitally Controlled RF Automatic Network for Plasma Applications”, Advanced Energy Inc., Fort Collins, Colorado, September, 1996.
15. E.F. Fuchs, A.A. Fardoun and B. Gregory “A Novel Wind Power Train: An Electronically Commutated Permanent-Magnet Generator with Flux Weakening Voltage Control”, Report prepared for the National Renewable Energy Laboratory, Golden, Colorado, August 1994.
16. E.F. Fuchs, A.A. Fardoun, Z. Chen and M.M.S. Masoum “Experimental Comparison of Geomagnetically Induced Current Blocking Techniques”, Report prepared for EPRI, California, March 1993.
17. E.F. Fuchs & A.A. Fardoun, “ AC Motor Testing for L.G. Balakrishnan & Bros., India”, Report prepared for Unique Mobility, Inc. Golden, Colorado, January 1993.
18. E.F. Fuchs and A.A. Fardoun “Simulation of Controller-Motor Drive System Using SPICE”, Report prepared for Unique Mobility, Inc. Golden, Colorado, January 1991.

e. Exhibits & Competitions

1. “Design of HW/SW System to Estimate Battery State of Charge and Life Span”, Engineering Students Renewable Energy Competition ESREC 2013, May 2013 Al-Ain UAE.
2. “Design SW/HW System to Compare the Performance of Different Battery Technologies for Solar Powered Street Light Application”, West-Meets-East: Exploring Sustainable Development, Innovation and Entrepreneurship Opportunities , Dubai 9- 11 January 2014.
3. “Design SW/HW System to Compare the Performance of Different Battery Technologies for Solar Powered Street Light Application”, ADNOC ADRAC conference, Abu-Dhabi, Feb. 2014.
4. “Design SW/HW System to Compare the Performance of Different Battery Technologies for Solar Powered Street Light Application”, International Conference on Renewable Energy: Generation and Applications ICREGA'14- Al Ain 2-5 March 2014.
5. “Design of A Solar Powered Traffic Signal Light in UAE Streets”, IEEE UAE student day, Abu-Dhabi, May, 2013.
6. “Design of A Solar Powered Traffic Signal Light in UAE Streets”, Renewable energy Student Competition, Al-Ain, May, 2013.
7. “Development of PV equivalent circuit via designed laboratory tests”, IDEX, January, 2013.

8. "Design of A Solar Powered Traffic Signal Light in UAE Streets", International Conference on Renewable Energy: Generation and Applications, ICREGA'12, Al-Ain, March, 2012.
9. "Monitoring Off-grid Hybrid Renewable Energy System", Renewable energy Student Competition, Al-Ain, May, 2012.
10. "Monitoring Off-grid Hybrid Renewable Energy System", International Conference on Renewable Energy: Generation and Applications, ICREGA'12 , Al-Ain, March, 2012.
11. "Off-Grid Hybrid Renewable Energy System for Safari Camps in UAE", ISSE'11 conference, March 2011.
12. "Off-Grid Hybrid Renewable Energy System for Safari Camps in UAE", IEEE UAE student day, Abu-Dhabi, May, 2011.
13. "Off-Grid Hybrid Renewable Energy System for Safari Camps in UAE", UAE-Swiss Research Day, Switzerland, 22-23, June 2011.
14. Bidirectional Converter for Renewable Energy Applications, **IDEX,** February, 2011.
15. Design of a Wheeled Soccer Robot, **ISMA'10 Conference**, Al-Ain, March 2010.
16. Design of a Wheeled Soccer Robot, **Innovations 09 Conference**, Al-Ain, December 2009.
17. A Fault Monitoring Circuit for Five Phase AC Motor, **IDEX,** February, 2009.
18. Ultra Step-Up DC-DC Converter with Reduced Switch Stress, **IDEX** February, 2009.
19. Design of DC_AC Inverter/Drive Using Solar Array as a Power Source, **World Energy Future Summit, WEFS,** January, 2008.
20. Design of DC_AC Inverter/Drive Using Solar Array as a Power Source, **6th annual GCC University Competition,** November, 2007.

f. Contracts and Grants

1. Abbas A. Fardoun, Ali Al-Marzouqi and Ala Hussein, "Evaluation of Effect of oil and gas industrial environments on efficiency and life span of PVs and Batteries", UAE University, 120,000 AED, 2014-2016.
2. Ala Hussein and Abbas A. Fardoun, "Improving the Cycle-life and Cost-efficiency of Backup Batteries in Stand-alone Photovoltaic Applications in UAE", UAEU, 460,000 AED, 2014-2016.
3. Abbas A. Fardoun, **"**Economic Feasibility Study of "Battery-less" Renewable Energy (PV and Fuel Cell) System for Remote Areas in UAE via Water Electrolysis", SURE competition, 35,000 AED, Summer 2014.
4. Abbas A. Fardoun, Design SW/HW to compare the performance of battery technologies for solar powered street light application, ADWEA, 46,000 AED, 2013-2014.
5. Abbas A. Fardoun, Hassan Noura, Ali Al-Marzouqi, Sulaiman Al-Zuhair and Abbas Khalil, "Fuel Cell and New Energy Technology Application in UAE", Japan Cooperation Center, Petroleum (JCCP), 4,600,000 AED, 2013-2014.
6. Abbas A. Fardoun, Ali Al-Marzouqi and Hassan Hejase, "Electrical Circuit Modeling of Fuel Cell Including Ripple effect", UAE University, 120,000 AED, 2012-2013.
7. Abbas A. Fardoun, Hassan Noura, Ali Al-Marzouqi, Sulaiman Al-Zuhair and Abbas Khalil, "Fuel Cell and New Energy Technology Application in UAE", Japan Cooperation Center, Petroleum (JCCP), 3,500,000 AED, 2012-2013.

8. Abbas A. Fardoun, "Design of A Solar Powered Traffic Signal Light in UAE Streets", Dubai Electricity and Water Authority (DEWA), 32,000 AED, 2012.
9. Abbas A. Fardoun and Esam Ismail, "High Gain DC-DC Converter for Renewable Energy Applications", Funded by UAE University, Grant Contract # Seed-EE-2011, 30,000 AED, 2011-2012.
10. Abbas Ahmed Fardoun," Off-Grid Hybrid Renewable Energy System for Safari Camps in UAE", Abu-Dhabi Electricity and Water Authority (ADWEA), 238,000 AED, 2011.
11. Abbas A. Fardoun, Esam Ismail & Adnan Harb, "Wide range Bidirectional converter for Fuel Cell/Photovoltaic Applications", funded by Emirates Foundation, Grant Contract # 2011/158, 140,000 AED, 2011-2013.
12. Abbas A. Fardoun & Esam Ismail, "Bridge-less AC/DC Converter for Low Power Applications", funded by UAE University, Grant Contract # 1568-07-01-10, 20,000 AED, 2009-2010.
13. Abbas Ahmed Fardoun, "Design of a Wheeled Soccer Robot", Abu-Dhabi Electricity and Water Authority (ADWEA), 100,000AED.
14. Abbas A. Fardoun, Hassan Noura & Esam Ismail, "Fault detection & monitoring for AC/AC Matrix converter Applications", funded by UAE University, Grant Contract # 06-04-7-11/09, 26,400 AED, 2009
15. Hassan Noura & Abbas Fardoun, "Fault Monitoring and Fault-Diagnostics in Wind Turbines", Funded by UAE University, 26,400 AED, 2009.
16. Abbas A. Fardoun, Hassan Noura & Esam Ismail, "Front End Inverter for a UPS system for telecommunication Application", funded by UAE University, Grant Contract #04 -04-7 -11/ 08, 25,000 AED, 2007-2008.
17. Hassan Noura & Abbas Fardoun, "Fault diagnosis and Fault-Tolerant control in complex systems", Funded by UAE University, 16,000 AED, 2007-2008.
18. Abbas A. Fardoun, Ali Assi & Jalal Jomaah, "Replacement of Mechanical Relays with MOSFET Devices Based on Silicon-On-Insulator (SOI) Technology", Funded by UAE University, Grant Contract # 03-04-7-11/07, 20,000 AED, 2006-2007.

g. Consultations

1. Kennedy and Associates
2. HTBM, ME.

h. Awards Given for Research and/or Teaching achievements

1. Supervised 3st place Student Poster Winner at ISSE'11 *Sharjah*, Research title "Off-Grid Hybrid Renewable Energy System for Safari Camps in UAE" March, 2011.
2. Supervised 1st place Student Poster Winner at *ISMA 10, Sharjah*, Research title "Design of a Wheeled Soccer Robot", April, 2010.
3. Supervised 1st place Co-Winners of Chancellors Undergraduate Research Award (CURA) 2008 titled, "A Fault Monitoring Circuit for Five Phase AC Motor", Fall 2008.
4. Senior IEEE Member 2005.
5. TRW distinguished patent Application Award 1999.

4. Teaching, Mentoring, and Advising

a. Courses taught in the last five years.

1. Advanced AC Drives (ELEC 627, Graduate Course)
2. Special Topics in Power (ELEC 629, Graduate Course)
3. Power Electronics (ELEC-592)
4. Graduation Project I (ELEC-590)
5. Graduation Project II (ELEC-585)
6. Special Topics in Power & Control (ELEC- 530)
7. Electric Energy Conversion (ELEC-411)
8. Electric Energy Conversion Lab (ELEC-481)
9. Electromechanical devices, (ELEC-372)
10. Circuits II, (ELEC 320)
11. Fundamentals of Engineering III (GENG 310)
12. Renewable Energy, (IBLC 310)

b. Course and/or Curriculum Development.

1. Initiated Renewable Energy Laboratory
2. Advanced AC Drives Course.
3. Established component level Power Electronics Lab.
4. Material for Special Topics in Power & Control (ELEC-530).
5. Additional material (ELEC-411)
6. Course material for Renewable Energy Course (IBLC 310)

c. Advising: Other than Research Direction.

- Advisor for undergraduate male students, 2008.

d. Advising: Research Direction.

i. <u>Undergraduate</u>

- ***Senior Students Graduation Projects***

1. Design of a solar driven golf cart, 2014-2015.
2. Design of energy efficient street light system for UAE, 2014.
3. Design SW/HW to compare the performance of battery technologies for solar powered street light application, 2013.
4. "Design of A Solar Powered Traffic Signal Light in UAE Streets", 2012.
5. "Monitoring Off-grid Hybrid Renewable Energy System", 2012
6. "Off-Grid Renewable Energy System", Fall 2011
7. "Off-Grid Hybrid Renewable Energy System for Safari Camps in UAE", 2011
8. "Energy Harvesting from water tap flow", 2010.

9. "Development of a small-size soccer robot: dribbling and shooting mechanisms and control", Interdisciplinary Project 2009-2010
10. "Design a wheeled Soccer Robot", Interdisciplinary Project,2009
11. "UPS Design for Tele-communication office Application", 2008
12. " Replacement of Mechanical Relays by Electrical switch",2007-2008
13. "Design and construction of an overhead crane", 2007-2008
14. "Design of DC_AC inverter/Drive using Solar array as power source", 2007.

- ***Summer Undergraduate Research Experiences (Sure) Project***

  Economic Feasibility Study of "Battery-less" Renewable Energy (PV and Fuel Cell) System for Remote Areas in UAE via Water Electrolysis (Summer 2014)

- ***Chancellor Undergraduate Research Award (CURA)Projects***

1. A fault monitoring Circuit for Five Phases AC Motor, 2008.
2. Using LED Strips as Lighting Source, 2008.

ii. <u>Graduate</u>

- Graduated for five MS students.
- Co-Advisor of one PhD student.
- Co-industrial Advisor for one PhD student (completed).

e. Continuous Development

- **Training**

1. Six Sigma Green Belt, 2004.
2. Shainin Red X Apprentice Foundation, August 2003.
3. 3-Day High Performance Driving Course, Bondurant, March, 2002.
4. Sensor-less Control for AC Drives, October 2001.
5. Vehicle Dynamics for Passenger Cars & Light Trucks, September, 2001
6. Value-Analysis Value Engineering, October, 2000.
7. System Design (Voice of the Customer), August 2000.
8. Noise Reduction Techniques in Electric Systems, October 1999.
9. Advanced EMC Printed Circuit Board Techniques, June 1999.
10. Electronic Design Techniques & Analysis Required to Meet Electromagnetic Compatibility Requirements, June 1999.
11. Global Development Process, April, 1999.
12. Electro-Static Discharge, November, 1998.
13. Valuing Diversity, September, 1998.

5. Service

a. Professional.

i. <u>Refereeing research papers submitted for publication in scientific journals and</u>

Journals

- IEEE Transactions on Industry Application Society.
- IEEE Transactions on Power Electronics.
- IEEE Transactions on industrial electronic.
- IEEE Transactions on Circuits and Systems.
- IEEE Transactions on Energy Conversion
- Elsevier Journal of Renewable energy.

ii. Offices and committee memberships held in professional organizations.

1. International scientific committee for international conference on Renewable energy and power quality
2. Technical program committee for IEEE Energy Conference and Exhibition, EnergyCon 2010.
3. Managing Guest Editor Elsevier Journal on Renewable energy, 2012.
4. Industrial Drive Committee, IEEE Industrial Application Society.
5. Smart Grid Committee, IEEE Industrial Application Society.
6. Transportation Committee, IEEE Industrial Application Society.
7. Guest Editor Elsevier Journal on Renewable energy, Special Issue 2010.
8. Industrial Drives Committee for IEEE IAS society (1990-present)
9. Society of Automotive Engineers (SAE) member (2000-2007)
10. Chaired Power Electronics session at IEEE MWCAS 51th annual meeting, Montreal, 2007.
11. Chaired Industrial Drives session at IEEE IAS annual conference, Hong Kong, 2005.
12. Organized Industrial Drives session at IEEE IAS annual conference, Hong Kong, 2005.
13. Lebanese Engineering Association, 2007-present.

iii. Other non-University committees, commissions, panels, etc.

- Technical committee: Emirates Energy Award 2012.
- Member on the Emirates Authority for Standardization & Metrology.
- IEEE Member, 1990, Senior IEEE member, 2005.

b. Campus.

i. Departmental.

- Coordinator power and control group (2013-present)
- Coordinator Research committee (2012-2014)
- Coordinator Graduate program 2013-present)
- Graduate Program Committee (2011)
- Department Strategic Plan Committee (2011)
- Curriculum Committee (2010-2011)
- Research Committee (07-08)
- Department Secretary (07-08)

- Safety Committee (07-2010)
- Assessment Committee (08-10)

ii. College.

- Steering Committee on Energy & Environment Center
- Coordinator of Renewable Energy Labratory
- Intellectual Property Advisory Committee
- Peer Evaluation Committee (2011)
- Safety Committee (07-present)
- Member of Robotic club
- Member of Power & Automation group

iii. University.

- Coordinator for UAEU Renewable energy Laboratory
- Co-Chair and organizing committee chair for International Conference on Renewable Energy: Generation & Application, March 2012.
- Program Committee Chair for International Conference on Renewable Energy: Generation & Application, March 2012.
- Chaired Organizing committee for International Conference on Renewable Energy: Generation & Application, March 2010.
- Chaired Renewable Energy Seminar RES08, Abu-Dhabi, 2008.

c. Service Awards and Honors.

- College of Engineering Community service Certificate, 2009.