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Electrical & Computer Engineering  
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#### **FIELD OF INTERESTS**

The analysis, design and control of rotating machinery, power electronics, and energy systems.

#### **EDUCATION**

**PhD in Electric Power Engineering,** **May, 2000**  
Rensselaer Polytechnic Institute Troy, NY.

**PhD Thesis:** Direct Adaptive Control of Permanent Magnet Motors

**MS in Electric Power Engineering,** **December, 1995**  
Rensselaer Polytechnic Institute Troy, NY.

**BS in Electrical and Electronics Engineering,** **June, 1993**  
Middle East Technical University Ankara, Turkey.

#### **EMPLOYMENT**

August 2009 -- present	<b>Assistant Professor</b> Electrical & Computer Engineering, The University of Akron, Akron, Ohio
August 2007 – May 2009	<b>Adjunct Professor</b> Graduate College of Union University, Schenectady, NY
January 2000 – August 2009	<b>Senior Research Engineer,</b> Advanced Energy Conversion LLC, Malta, NY
May 1995 – December 1999	<b>Research Assistant,</b> Rensselaer Polytechnic Institute, Troy NY
May 1992 – September 1992	<b>Summer Intern,</b> National Telecom Inc. Izmir, Turkey
May 1991 – September 1991	<b>Summer Intern,</b> Vestel Electronics Inc. Manisa, Turkey

## TEACHING EXPERIENCE

The University of Akron

- Teaching energy conversion course
- Modifying and teaching electric motor drives course
- Teaching modern power systems course
- Developing and teaching modeling and control of renewable energy systems course

Graduate College of Union University

- Developing curriculum for energy conversion concentration (working with Dean Robert Kozik, Professors David A. Torrey and George Goodman)
- Developing and teaching digital control systems course.

## PROJECTS INVOLVED

**Rensselaer Polytechnic Institute, 1994 – 1999**

### **Adaptive Control of Permanent Magnet Motors**

**(Lockheed Martin)**

Two types of permanent magnet (PM) motors are studied: the permanent magnet brushless dc motor (PMBDCM) and the permanent magnet synchronous (PMSM) motor. Three types of adaptive controller are applied including direct and indirect techniques. Direct model reference adaptive controller is compared against indirect adaptive techniques and a non-adaptive PI controller. A new approach for controlling two axes currents for PMSM is presented. The new control strategies to reduce torque ripple in PMSM and PMBDCM are presented. The developed control algorithms are successfully implemented on the SABER and Matlab simulators. Experimental verification is performed on a DSP-based 30 hp commercial PMSM drive system.

**Advanced Energy Conversion, 2000 –2009**

### **Belt Driven Starter Alternator Systems**

Two starter/alternator systems have been developed. The first system was intended to serve as an integrated starter/alternator for a hybrid vehicle. During starting the ISA could provide 300Nm of torque up to a speed of 250 rpm. Second starter/alternator system was designed to be a belt-driven restarter/alternator unit that would only provide sufficient torque for starting the engine when warm. Following topics were investigated throughout the development of starter/alternator systems.

- Algorithm development for closed loop excitation control of high speed switched reluctance generators.
- Algorithm development for closed loop excitation for switched reluctance motors.
- Embedded control design and control algorithm implementation using ADMC401 Analog Devices DSP.
- Matlab Simulink modeling of SRM to validate the system for design specifications.

### **High Performance Motor Drives**

- Developing Predictive Space Vector Current Regulation Algorithm to be used in PMSM motor drive.

- Developing embedded DSP Platform using ADSP21992, BF533 Blackfin Processor and Altera Cyclone Field Programmable Gate Array (FPGA).
- Experimental Implementation of developed current regulation algorithm using high performance embedded DSP platform.
- Modeling Multilevel Inverters using Matlab Simulink Program
- Designing 1 MW multilevel inverter for Brushless DC Motor Drive
- Developing Closed Loop Voltage Balancing Technique for Diode Clamp Multilevel Inverter
- Developing Fast Space Vector PWM technique for hardware implementation

**Power Conditioning System for interfacing Dc Energy Storage to Electric Utility System (U.S. Department of Energy )**

The objective of the work was to develop a robust and inexpensive power conditioning system that will interface a large sodium sulfur battery bank to the utility. The system processes power in both directions to support battery charging and delivering battery energy to the utility system. The development activity has been directed at multi-level converters at the 100kW power level, with the expectation that the technology can be scaled up to significantly higher power levels. Specifically following topics were investigated in detail throughout the project.

- Developing Anti-Islanding Algorithm for three phase utility interactive inverter to meet IEEE-1547 standards.
- Control algorithm and embedded control development for utility interactive inverter.

**Inverter/Charger System for Residential and Commercial Back up Power (New York State Energy Research and Development Authority (NYSERDA))**

The inverter/charger system is able to support power flow in either direction, either delivering power to the ac loads (including the utility), or drawing power from an ac source to charge batteries. Energy storage system capable of supporting peak load management, critical loads, and renewable energy sources. Following items were tackled throughout the project.

- Topology selection and sizing for a utility interactive battery supplied 5 KW inverter.
- Control Algorithm Development for the system.

**2.5kW Inverter for Solar Photovoltaic (New York State Energy Research and Development Authority (NYSERDA) and U.S. Department of Energy)**

The inverter has the ability to automatically transition from current source operation when utility interactive to voltage source operation when utility independent. This ability allows this inverter to continue feeding critical loads even during utility outages. Following topics are investigated in detail.

- Developing Maximum Power Point Tracking Algorithm to get maximum power out from solar photovoltaic (PV) cells.
- Developing Anti-Islanding Control Algorithm to meet UL 1741 standards.
- Embedded control design for solar PV inverter.
- Control implementation of zero voltage switched high frequency solar PV inverter using ADMCF340 Analog Devices digital signal processor.

**Electric Hydrostatic Steering Assist Module (EHSAM)**

- Complete SRM Drive system modeling using Matlab Simulink Program.
- Closed loop excitation algorithm development for SRM.
- Control implementation of servo system using ADMC401 Analog Devices DSP.
- Control Development for Flux weakening operation of Brushless DC Motor.
- DSP implementation of Servo control of Brushless DC motor.
- Developing interface system between motor drive and EHSAM.

**High Power Density Motor/Propulsor**

- Developing motor design software for Double sided Brushless Dc and Switched Reluctance Motors (SRM) using Matlab.

- Designing double sided and conventional Brushless DC and SRM using design software for comparison.
- Sizing inverter for double sided brushless dc motor.

#### **Adaptive Control of Interior Permanent Magnet Motor Based Electric Assist Drive System**

- Interior Permanent Magnet Motor (IPM) Characterization
- Developing Predictive space vector current regulation algorithm for IPM control and Hardware Implementation for EADS.

#### **Brushless DC Based Military Tactic Starter/Generator Drive**

- Modeling Brushless DC Machine and control algorithm in Matlab Simulink using experimental data.
- Embedded controller design, control algorithm development and DSP implementation using Analog Devices ADMC331 DSP.
- Designing EMI Filter to meet Military EMC Standards.

#### **Motor Drive System for Axial Flux Brushless DC Starter Generator**

- Developing current source inverter for low inductance axial flux Brushless DC Machines
- Sensorless control algorithm development and implementation.

#### **Mutually Coupled Switched Reluctance (MCSR) Based 50 Hp wind turbine Generator (New York State Energy Research and Development Authority (NYSERDA))**

- Control algorithm development of MCSR Generator Drive.
- Texas Instruments TMS320 F240 DSP implementation of MCSR Generator control.

#### **Utility Interactive Wind Simulator (Rensselaer Polytechnic Institute and New York State Energy Research and Development Authority (NYSERDA))**

- Modeling 10 KW commercial wind turbine for hardware simulation
- Developing speed control algorithm for BDCM using switched mode rectifier for Maximum Power Point Tracking.
- Developing utility interactive inverter

#### **Fly Wheel Energy Storage for Cooling System**

- Complete hardware and software design of embedded control and power electronic system for Brushless Dc Based 800 W Starter Alternator Driver.

#### **Bi Directional Dc-Dc Converter for Hybrid Electric Vehicles**

- Developing embedded control for the system.
- Developing control algorithm for the system

#### **Brushless DC Motor Drive for Valve Actuator**

- Power inverter and control electronic design for Brushless DC Motor
- DSP implementation of Servo control of Brushless DC motor.
- Developing interface system between motor drive and valve system.

#### **Starter/Generator system for pick up truck with Idle Stop Strategy (New York State Energy Research and Development Authority (NYSERDA))**

- Designing brushless dc type starter/generator for pick up truck
- Electronic hardware design for motor control and vehicle interface.

## **PUBLICATIONS**

### **JOURNAL PUBLICATIONS:**

1. S. Narla, Y. Sozer and I. Husain “Switched Reluctance Generator Controls for Optimal Power Generation and Battery Charging” IEEE Transactions on Industry Applications, Vol. 48, No.5, September/October,2012 .
2. N. Arafat, S. Palle, Y. Sozer, and I. Husain “Transition Control Strategy between Standalone and Grid Connected Operation of the Voltage Source Inverters” IEEE Transactions on Industry Applications, Vol. 48, No.5, September/October,2012.
3. Y. Sozer, D.A. Torrey, E. Mese “An Adaptive Predictive Current Control Technique for Permanent Magnet Synchronous Motors” Accepted for publication in IET Power Electronics Transactions.
4. R. Mikail, I. Husain, Y. Sozer M. Islam and T. Sebastian “Torque Ripple Minimization of Switched Reluctance Machines through Current Profiling” Accepted for publication in IEEE Transactions on Industry Applications.
5. Y. Zou, M. Elbuluk, Y. Sozer, "Stability Analysis on Maximum Power Points Tracking (MPPT) Method in Wind Power System" Accepted for publication in IEEE Industry Applications Society Magazine.
6. Y. Zou, M. Elbuluk, Y. Sozer, "Simulation Comparisons and Implementation of Induction Generator Wind Power Systems" Accepted for publication in IEEE Transactions on Industry Applications.
7. Y. Sozer, D.A. Torrey “Advanced Control Techniques on Grid Connected Inverters” (invited paper) IEEE Transactions on Power Electronics, Special Issue on Modeling and Advanced Control of Power Electronics, Vol. 24, No. 11, November 2009, pp. 2475-2483.
8. Y. Sozer, D.A. Torrey “Optimal Turn-off Angle Control in the Face of Automatic Turn-on Angle Control for Switched-Reluctance Motors” IET Proceedings Electric Power Applications, Vol. 1 pp. 395-401, May 2007.
9. Y. Sozer, D. A. Torrey, “Closed Loop Control of Excitation Parameters for High Speed Switched-Reluctance Generators” IEEE Transactions on Power Electronics, Vol.19 No.2 March 2004.
10. Y. Sozer, D.A. Torrey, E. Mese, “Automatic Control of Excitation Parameters in Switched Reluctance Motor Drives”, IEEE Transactions on Power Electronics, Vol.18 pp. 594-603 March 2003.
11. Y. Sozer, D.A. Torrey, and S. Reva “New Inverter Output Filter Topology for PWM Motor Drives” IEEE Transactions on Power Electronics, Vol. 15, pp 1007-1017 November 2000.

### **PEER REVIEWED CONFERENCE PUBLICATIONS:**

12. Y. Yasa, Y. Sozer, E. Mese “Unbalanced Fault Analysis of Doubly Fed Induction Generator Drive System for Wind Turbine Applications” Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.
13. A. Elrayyah, Y. Sozer “Simple and Robust PLL Algorithm for Single-Phase Grid-Connected Renewable Energy Sources” Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.
14. Amir M. Pasdar, Y. Sozer, I. Husain “Novel Online Overhead Power Line Segments High Frequency Impedance Measurement” Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.

15. A. Elrayyah, Y. Sozer, M. Elbuluk "A Novel Load Flow Analysis for Particle-Swarm Optimized Microgrid Power Sharing" Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.
16. A. Elrayyah, Y. Sozer, M. Elbuluk "Improving the Operation of Microgrid Interfaced Inverter Using L-Type Filter" Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.
17. T. Husain, A. Elrayyah, Y. Sozer, I. Husain "An Efficient Universal Controller for Switched-Reluctance Machines" Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.
18. T. Husain, A. Elrayyah, Y. Sozer, I. Husain "Dq Control of Switched Reluctance Machines" Accepted for publication in the Proc. of the IEEE APEC Lon Beach CA, 2013.
19. Y. Zou, M. Elbuluk and Y. Sozer "Maximum Power Points Tracking of Doubly-Fed Induction Generator Wind Power System" in Proc. of the IEEE IAS Annual Meeting Las Vegas NV, October, 2012.
20. S. Palle, N. Arafat, Y. Sozer and I. Husain, "Voltage Harmonic Control of Weak Utility Grid through Distributed Energy Systems", in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
21. W. Uddin, T. Husain, R. Mitra, E. Ofori, Y. Sozer and I. Husain, "A Chirp PWM Scheme for Brushless DC Motor Drives" in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
22. M. Badawi, A. Yilmaz, Y. Sozer and I. Husain, "Parallel Power Processing Topology for Solar PV Applications", in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
23. Y. Zou, M. Elbuluk and Y. Sozer, "A Robust Real-Time Maximum Power Point Tracking (MPPT) Method for Wind Power Systems" in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
24. A. Elrayyah, A. Safayet, Y. Sozer, I. Husain and M. Elbuluk "Novel Harmonic and Phase Estimator for Grid-Connected Renewable Energy Systems" in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
25. A. Elrayyah, K. Namburi, Y. Sozer and I. Husain, "A Novel Dithering Algorithm to Reduce the Electro-Magnetic Interference (EMI) in Single Phase DC/AC Inverters" in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
26. C. Sikder, I. Husain and Y. Sozer "Switched Reluctance Generator Control for Optimal Power Generation With Current Regulation" in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
27. A. Pasdar, Y. Sozer and I. Husain, "Non-Intrusive Active Power Clamp Filter on PLC Channels for Smart Grid Applications" in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
28. R. Mikail, I. Husain, Y. Sozer, M. Islam and T. Sebastian, "Four-Quadrant Torque Ripple Minimization of Switched Reluctance Machine through Current Profiling with Mitigation of Rotor Eccentricity Problem and Sensor Errors", in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
29. R. Mikail, I. Husain, Y. Sozer, M. Islam and T. Sebastian "A Fixed Switching Frequency Predictive Current Control Method for Switched Reluctance Machines", in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.
30. M. Khan, Y. Sozer and I. Husain "Integrated Electric Motor Drive and Power Electronics for Bidirectional Power Flow between Electric Vehicle and DC or AC grid", in Proc. of the IEEE Energy Conversion Congress & Expo Raleigh, NC, September, 2012.

31. A. Elrayyah, Y. Sozer, M. Elbuluk, "Simplified Modeling Procedure for Inverter-based Islanded Microgrid" in Proc. of IEEE EnergyTech2012, Cleveland, OH, May, 2012.
32. A. Yilmaz, M. Badawi, Y. Sozer, I. Husain, "A Fast Battery Charger Topology for Charging of Electric Vehicle" in Proc. of IEEE 2012 International Electric Vehicle Conference, Greenville, SC March, 2012.
33. M. Khan, Y. Sozer, I. Husain, "A Bi-directional DC-DC Converter with Overlapping Input and Output Voltage Ranges and Vehicle to Grid Energy Transfer Capability" in Proc. of IEEE 2012 International Electric Vehicle Conference, Greenville, SC March, 2012.
34. A. Elrayyah, Y. Sozer, I. Husain, M. Elbuluk, "Power Flow in a microinverter based microgrid" in Proc of the IEEE Applied Power Electronics Conference and Exposition, Orlando, FL, 2012.
35. S. Ghebremariam, S. Beygi, H. Reza Bahrami, Y. Sozer, and H. Mohsenian-Rad, "Energy Production Cost and PAR Minimization in Multi-Source Power Networks to the Submission Site", accepted for publication in the Proc. of the *IEEE PES Innovative Smart Grid Technologies Conference (ISGT'2012)*, Washington, DC, January 2012.
36. Y. Zou, M. Elbuluk, and Y. Sozer, "Stability Analysis of Maximum Power Points Tracking (MPPT) Method in Wind Power Systems" in the Proc. of the IEEE IAS Annual Meeting, Orlando, FL, October, 2011.
37. S. Narla, Y. Sozer and I. Husain "Switched Reluctance Generator Controls for Optimal Power Generation and Battery Charging" in the Proc. of the IEEE Energy Conversion Congress & Expo Phoenix, AZ, September, 2011.
38. R. Mikail, Y. Sozer, I. Husain, M. Islam and T. Sebastian, "Torque Ripple Minimization of Switched Reluctance Machines through Current Profiling" in the Proc. of the IEEE Energy Conversion Congress & Expo Phoenix, AZ, September, 2011.
39. P. Mantravadi, I. Husain and Y. Sozer, "Modeling, Implementation and Analysis of a Li-ion Battery Powered Electric Truck" in the Proc. of the IEEE Energy Conversion Congress & Expo Phoenix, AZ, September, 2011.
40. N. Arafat, S. Palle, I. Husain and Y. Sozer "Transition Control Strategy between Standalone and Grid Connected Operation of the Voltage Source Inverters" in the Proc. of the IEEE Energy Conversion Congress & Expo Phoenix, AZ, September, 2011.
41. N. Mahmud, Y. Sozer and I. Husain "Energy capture improvement of a solar pv system with a multilevel inverter" in the Proc. of the IEEE Energy Conversion Congress & Expo Phoenix, AZ, September, 2011.
42. Y. Zou, M. Elbuluk Y. Sozer, "A Complete Modelling and Simulation of Induction Generator Wind Power Systems" in Proc. of the IEEE IAS Annual Meeting, Vol.1, pp. 1-8, Houston, TX, October, 2010.
43. Y. Sozer, D. A. Torrey, "Meeting MIL-STD-461 for 2kW Military Tactic Generator Drive System" in Proc. of the IEEE Energy Conversion Congress & Expo, pp. 942-946 Atlanta, GA, September, 2010.
44. Y. Sozer, D.A. Torrey, and E. Mese "An Adaptive Predictive Current Control Technique for Permanent Magnet Synchronous Motors" in Proc. of the IEEE Energy Conversion Congress & Expo Atlanta, pp. 2819-2826, GA, September, 2010.
45. Y. Sozer, D. A. Torrey, "Closed Loop Control of Excitation Parameters for High Speed Switched-Reluctance Generators" Proc. of the IEEE APEC, Vol. 1. pp 75-82 Miami Beach, FL, February,2003.

46. Y. Sozer, D.A. Torrey, E. Mese, "Automatic Control of Excitation Parameters in Switched Reluctance Motor Drives", Proc. of the IEEE APEC, Vol. 1. pp 48-56 Dallas, TX, March 2002.
47. D.A. Torrey, J. Kokernak, E. Mese, Y. Sozer, "Integrated Bus Conductors Improve System Performance in Modular Drives", Power Conversion and Intelligent Motion Conference, Boston, October, 2000.
48. E. Mese, Y. Sozer, J. Kokernak, D.A. Torrey, "Advanced Torque Ripple and Acoustic Noise Correlation in Switched Reluctance Machines", International Conf. on Electric Machines, , pp. 1767-1771, Helsinki, Finland, August 2000.
49. E. Mese, Y. Sozer, J. Kokernak, D.A. Torrey, "Optimal Excitation of a High Speed Switched Reluctance Generator", Proc. of the IEEE APEC, New Orleans, LA, March, 2000.
50. Y. Sozer, D.A. Torrey, and S. Reva "New Inverter Output Filter Topology for PWM Motor Drives" Proc. of the IEEE APEC, New Orleans, LA, March, 2000.
51. Y. Sozer, "Direct Adaptive Control of Permanent Magnet Motors", PhD Dissertation, Electric Power Engineering, Rensselaer Polytechnic Institute, Troy, NY, USA, December, 1999.
52. Y. Sozer, D.A. Torrey, "Adaptive Flux Weakening Control of Permanent Magnet Synchronous Motors" Proc. of the IEEE IAS Annual Meeting, Vol. 1. pp 574-583 October, 1999.
53. Y. Sozer, D. A. Torrey, "Adaptive Torque Ripple Control of Permanent Magnet Brushless DC Motors", Proc. of the IEEE APEC, Vol. 1. pp 86-92 Anaheim, CA, February, 1998.
54. Y. Sozer, H. Kaufman, and D. A. Torrey, "Direct Model Reference Adaptive Control of Permanent Magnet Brushless DC Motors", Proc. of the IEEE Int. Con. On Control App., Vol. 1, pp. 633-638, Hartford, October 1997.

#### **PATENTS ISSUED**

- D.A. Torrey, Y. Sozer, "Closed Loop Control of Excitation Parameters for Switched-Reluctance Motors" Advanced Energy Conversion LLC. Cohoes NY. Patent No. United States Patent 6,864,658 March 8, 2005
- M. Kaplan, J.M. Kokernak, E. Mese, Y. Sozer, D. A. Torrey OH. "Method for Operating a Switched Reluctance Electrical Generator Using Data Mapping" Dana Corporation, Toledo, Patent No: United States Patent 6,819,008 November 16, 2004
- Y. Sozer, D.A. Torrey, E. Mese, "Control Method for Switched Reluctance Motor" Dana Corporation, Toledo, OH. Patent No. United States Patent 6,788,021 B2 September 7, 2004  
Patent No: German Patent (Deutsches patent-und Markenamt) DE 10313927 March 27, 2003  
Patent No: Japanese Patent JP 2003299383 October 17, 2003
- M. Kaplan, J.M. Kokernak, E. Mese, Y. Sozer, D. A. Torrey OH. "Method for Operating a Switched Reluctance Electrical Generator" Dana Corporation, Toledo,  
Patent No: World Intellectual Property Organization WO 01/59922 A3 March 7, 2002  
Patent No: Canadian Intellectual Property Office CA 2399699 A1 August 16, 2001  
Patent No: European Patent Office EP 1 256 164 A2 August 16, 2001
- D.A. Torrey, Y. Sozer "Closed Loop Control of Excitation Parameters for High Speed Switched-Reluctance Generators" Dana Corporation, Toledo, OH. Patent No. United States Patent 7,071,659 July 4, 2006

#### **RESEARCH GRANTS FUNDED**

1. **Project/ Proposal Title:** Clean Technology Sensors Support for Ohio Companies to Add Value to their Products and Help Move them to the Market Place at an Accelerated Pace

**Personnel:** Jose Alexis De Abreu Garcia, Yilmaz Sozer, Tom Hartley, Bob Veillette, Joan Carletta, , Kye-Shin Lee

**Funding Agency:** State of Ohio (Third Frontier Project)

**Total Amount of Award:** 1,670,000



**Total Period Covered:** 01/07/11 - 12/30/13

**Person Months Per Year Committed to Project:** 2 summer month.

**2. Project/ Proposal Title:** Research and Development of Clean Vehicle Technology

**Personnel:** Tom Hartley, Yilmaz Sozer, Dane Quinn,

**Funding Agency:** US Department of Energy

**Total Amount of Award:** 1,000,000

**Total Period Covered:** 01/7/11 - 03/31/12

**Person Months Per Year Committed to Project:** 1 summer month.

**3. Project/ Proposal Title:** Hardware in the Loop Simulator to Assist the Development of the PM Brushless DC Motor Drives.

**Personnel:** Yilmaz Sozer

**Funding Agency:** Bendix Commercial Vehicle Systems.

**Total Amount of Award:** \$74,317

**Total Period Covered:** 2011-2012

**4. Project/ Proposal Title:** Scalable, Low-Cost, High-Performance Non-Rare Earth PM Motor for Hybrid Vehicles.

**Personnel:** Yilmaz Sozer, Malik Elbuluk.

**Funding Agency:** GE Global Research subcontract US Department of Energy

**Total Amount of Award:** \$112,000

**Total Period Covered:** 2012-2015

**5. Project/ Proposal Title:** System Design and Feasibility Testing of Mobile Charging System for Electric Vehicles.

**Personnel:** Yilmaz Sozer, P. Yi.

**Funding Agency:** Ohio Transportation Center

**Total Amount of Award:** \$119,650

**Total Period Covered:** 2012

**6. Project/ Proposal Title:** Switched Reluctance Machine and Controller Development for Electric Power Steering

**Personnel:** Iqbal Husain, Yilmaz Sozer

**Funding Agency:** Nexteer.

**Total Amount of Award:** \$37,619

**Total Period Covered:** 2010-2011

**7. Project/ Proposal Title:** SRM drive model simulation, controller development, inverter design.

**Personnel:** Iqbal Husain, Yilmaz Sozer

**Funding Agency:** Continental Electrical Motor Services Edmonton, AB, Canada

**Total Amount of Award:** 66,973.

**Total Period Covered:** 07/15/10 – 07/15/11

**Person Months Per Year Committed to Project:** 1 summer month.

## **DISSERTATION/ THESIS COMPLETED**

1. Sandeep Narla , “Modelling and control of switched reluctance machine with four quadrant operations” (MS) December 2010, Co Advisor: I. Husain.
2. Nayeem Mahmud, “Energy capture improvement of a solar system with a multilevel inverter” (MS) August 2011. Co Advisor: I. Husain.
3. Brad Mularcik, “Virtual Moving Air Gap For the Speed Range Improvement” (MS) August 2012. Co Advisor: I. Husain.
4. Sreeshailam Palle, “Voltage harmonic control of weak utility grid through distributed energy systems” (MS) August 2012
5. Mohamed Badawi, “Modeling analysis and experimental implementation of the parallel power processing topology for solar pv applications” (MS) August 2012
6. Krishna Namburi, “A Novel dithering algorithm to reduce electromagnetic interference in voltage source inverters” (MS) August 2012
7. Yu Zou, “Modeling and control of doubly-fed induction generator (DFIG) wind power system and maximum power point tracking (MPPT),” (Ph. D) August, 2012, (Advisor Name: Dr. Elbuluk, Co Advisor: Yilmaz Sozer)

## **IN-PROGRES**

1. Nayeem Arafat “Power electronic interface for vehicle to grid operation systems” Ph.D.
2. Ali Elreyyah “Adaptive Microgrids for Renewable Energy Systems” Ph.D.
3. Amir Mehdi Pasdar “High frequency power line network modeling for smart grid applications” Ph.D.
4. Wasi Uddin “Sinusoidal mutually coupled reluctance machines for traction applications” Ph.D.
5. Aparna Saha “Unified Battery Charging System through Multilevel Inverters” Ph. D.
6. Fatih Cingoz “Integration of Renewable Energy Systems into Microgrids” Ph. D.
7. Burak Tekgun “Design of Doubly Fed Induction Generators for Wind Turbine Applications”
8. Ernest Ofori “ Four Quadrant Sensorless Control of Switched Reluctance Machines” MS
9. Hari Prasad “Developing Range Extension for Series Hybrid Vehicles” MS
10. Tausif Husain “Dq Control of Switched Reluctance Machines” MS
11. Adeeb Ahmed “Fast Adaptive Flux Weakening Control of Permanent Magnet Synchronous Motors” MS
12. Rakesh Mitra “Direct Model Reference Adaptive Control of Switched Reluctance Motors” MS

## **PROFESSIONAL ACTIVITIES**

- Associate Editor, Transaction on IEEE Industry Application Society Electrical Machine Committee 2010-
- Secretary, IEEE IAS Sustainable and Renewable Energy Systems Committee 2012-
- Vice Program Chair, IEEE Energy Conversion Congress & Expo Phoenix, AZ September 2011.
- Session Chair, IEEE Energy Conversion Congress & Expo Phoenix, AZ September 2011.
- Topic Chair, IEEE Energy Conversion Congress & Expo Raleigh, NC September 2012.
- Session Chair, IEEE Energy Conversion Congress & Expo Raleigh, NC September 2012.
- Session Chair, IEEE IEVC 2012 Conference Greenville, SC, March, 2012
- Referee for IEEE Power Electronic Specialists Conference **2006**
- Referee for IEEE Power Electronic Specialists Conference **2007**
- Member of International Advisory Board :  
International Hydrogen Energy Congress & Exhibition **2007**

- Referee for IEEE Transactions on Power Electronics Letters **2005-**
- Referee for IEEE Transactions on Power Electronics **2006-**
- Referee for IEEE Transactions on Industry Applications **2006-**
- Referee for IEEE Transactions on Magnetics **1999, 2005**
- Referee for IEEE Applied Power Electronic Conference **2002,2010,2011,2012,2013**
- Referee for Conference on Control of Industrial Systems **1997**
- Referee for IET Power Electronics **2008-**
- Referee for IEEE Energy Conversion Congress and Exposition **2009,2010,2011,2012**
- Referee for IEEE Transaction on Industrial Electronics **2009-**
- Referee for IEEE International Conference on Sustainable Energy Technologies **2010**

## **AWARDS**

- Scholarship from Ministry of Turkish Education for Graduate Studies in US, as being the top student among nationwide examination. **1993-1995**
- Scholarship to study at Izmir Science High (Boarding) School selected with nationwide examination. **1985-1988**