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The analysis, design and control of power electronics, rotating machinery,

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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. 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.

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Two starter/alternator systems (SA) have been developed. The first system was intended to serve as an integrated starter/alternator for a hybrid vehicle. During starting the integrated SA could provide 300 Nm of torque up to a speed of 250 rpm. Second starter/alternator system was designed to be a belt-

Algorithm, meeting UL 1741 standards, zero voltage switched high frequency inverter operation, and embedded control have been explored in detail during this research and development project.

Switched reluctance and brushless dc motor drives developed as a part of electric hydrostatic steering assist module. Overall system has been characterized and servo controller has been developed to achieve smooth EHSAM operation.

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SiC Based Power Electronic Driver for Electric Vehicle Traction.
Yilmaz Sozer

Department of Energy/Power America
: \$225,236 (2019-2021)

Design, procure, build, and test a prototype Integrated Starter Generator (ISG) Switched Reluctance Motor for research and development use which uses no rare earth materials.

Yilmaz Sozer

US A : r\$65.004 4

Glucose sensor development
Kye-Shin Lee, Yilmaz Sozer
I2V Inc
\$30,000 (2014-2016)

System Design and Feasibility Testing of Mobile Charging System for
Electric Vehicles.
Yilmaz Sozer, P. Yi.
Ohio Transportation Center
\$119,650 (2012)

Switched Reluctance Machine and Controller Development for Electric
Power Steering
Iqbal Husain, Yilmaz Sozer
Nexteer.
: \$37,619 (2010-2011)

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32. S. Das and Y. Sozer, "Design and Analysis of an Axial Flux Doubly Fed Induction Generator for Wind Turbine Applications," *IEEE Energy Conversion Congress & Expo (ECCE)*, Baltimore, MD, pp. 442-447, September 2019.
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76. I. Hasan, Y. Sozer, A. P. Ortega, S. Paul, R. Islam, "Investigation of design based solutions to reduce vibration in permanent magnet synchronous machines with low order radial forces," *IEEE Energy Conversion Congress & Expo (ECCE)*, Cincinnati, OH, pp. 5431-5437, September 2017.
77. E. Pazouki, J. A. De Abreu-Garcia, Y. Sozer, "Fault tolerant control method for interleaved DC-DC converters under open and short circuit switch faults," *IEEE Energy Conversion Congress & Expo (ECCE)*, Cincinnati, OH, pp. 1137-1142, September 2017.
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4. Keynote Speaker “Impacts of Smart LED Lighting on Energy Systems: Problems, Opportunities” *International Workshop on Solid State Lighting Technologies and Research 2013: LEDs and OLEDs*

12. Iftekhar Hasan	Modeling and Analysis of High Torque Density Transverse Flux Machines for Direct-Drive Applications	PhD	Dec. 2017 Rivian
13. Elham Pazouki	Fault Detection, Identification And Protection Method For Single Stage And Interleaved Boost Converters (Co-Adv.)	PhD	Aug, 2018 (Rockwell)
14. Farzad Ahmadi	A Novel Low Loss And Lightweight Magnetic Cores for Electrical Machinery (Co-Adv.)	PhD	Dec, 2018 (Assist. Prof. Young0 0 9.9660 (ssist) t7\$W nBT0.

	quadrant operations		
29. Nayeem Mahmud	Energy capture improvement of a solar system with a multilevel inverter	MS	Aug. 2011 (ZF)
30. Brad Mularcik	Virtual Moving Air Gap For the Speed Range Improvement	MS	Aug. 2012 (Diebold)
31. Sreeshailam Palle	Voltage harmonic control of weak utility grid through distributed energy systems	MS	Aug. 2012 (Chrysler)
32. Krishna Namburi	A novel dithering algorithm to reduce EMI in voltage source inverters	MS	Aug. 2012 (Nexteer Automotive)

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46. Mehmet A. Gormez	Driving Cycle Optimization Of An Electric City Bus Network	MS	Aug , 2018 CWR Univ.
47. Oguzhan Kilic	Split Winding Switched Reluctance Machine Drives For Wide Speed Range Operations	MS	Aug, 2018 TurkPetroleum
48. Rachana Shukthija Dasari	Health monitoring of power systems through EMI emission	MS	Dec, 2018 Ford
49. Ali Topcu	Fault detection and reliability analysis for motor drives with multilevel converters	PhD	Dec, 2020 ZF
50. Samir Chowdhury	MPPT control for wireless charging systems	MS	May, 2021
51. Fubing Han	Evaluation of Wind Resources Generated from Vehicle Wake	MS	May, 2021

