CURRICULUM VITA

NAME:	Nabeel A. O. Demerdash (U.S. Citizen)
BIRTH DATE:	April 26, 1943
MARITAL STATUS:	Married, Three Children Spouse's Name: Esther, Children: Yvonne, Omar and Nancy
TELEPHONE:	414-288-3975 (Work) 262-827-0994 (Home)
PRESENT POSITION:	Professor, Department of Electrical and Computer Engineering, Marquette University Milwaukee, WI 53201-1881
DEGREES:	B.Sc.E.E. (Distinction - First Class Honors), Cairo University, Egypt, 1964 M.S.E.E., University of Pittsburgh, 1967 Ph.D., University of Pittsburgh, 1971
FIELD OF SPECIALIZATIONS:	Electric Machinery, Drive Systems and Power Electronics, Fault Diagnostics in Electric Drives, Space Energy Systems - Solar Dynamic Energy Generation and Processing, Computer-Aided Design and Simulation of Electrical Devices and Systems, Computational Electromagnetic/Finite Elements and Applications to Electromagnetic Fields in Electrical Power Devices and Systems, Electromechanical Energy Conversion, Propulsion and Actuation.

1.0 ACADEMIC EXPERIENCE:

1.1 Teaching Experience:

1. 1994 to Present, Marquette University, Department of Electrical and Computer Engineering, as Professor and Chairman (1994-1997), Professor (1997-present). Winner of the Eta Kappa Nu, Beta Omicron Chapter, Teacher of the Year Teaching Excellence Award, 2003.

   Subjects taught:

   a) Special Topics in Power Systems and Devices/Electrical Transients in Power Systems (EECE 183), Spring 1995.

   b) Special Topics in Power Systems and Devices/Adjustable Speed Drives for Industrial Applications (EECE 183), Summer Session II, 1995.

   c) Electromechanical Energy Conversion (EECE 123, now Electric Drives ELEN 3210), Fall 1995, Spring Semesters 1996 through 2016.

   d) Electromagnetic Fields I (EECE 121), Fall Semesters 1997 through 2003.

e) Special topics in Power Systems and Devices/Electrical Transients and Protection in Power Systems (EECE 183), Summer Session II, 1995, Fall 1997.

f) Power Systems (EECE 182), Spring 1998

g) Design and Analysis of Electric Motors in Adjustable Speed Drives (EECE 185, now EECE 5210/ELEN 4210), Fall Semesters 1998 through 2016.

h) Advanced Electric Machinery (EECE 281, now EECE 6210), Fall 1997, Spring 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, and 2015.

i) Principles of Design of Power Systems Protection and Monitoring (EECE 186, now EECE 5240/ELEN 4240), Spring Semesters 1999, 2001, 2004, and Fall 2005, 2007, 2009, 2011, and 2013.

j) Electrical Transients and Surges in Power Systems and Devices (EECE 187, now EECE 5250/ELEN 4250), Spring Semesters 1998, 2000, 2002 and 2003, Fall 2004, 2006, 2008, 2010, 2012, 2015, and 2016.

k) Advanced Concepts in the Design and Modeling of Electric Machines and Drives (EECE 285, now EECE 6220), Spring 2002, 2004, 2006, 2008, 2010, and 2012, and 2014.

l) Finite Elements (EECE6230), Spring 2009 and Fall 2014.

2. 1983 to 1994, Clarkson University, Department of Electrical and Computer Engineering, as Professor (1983-1994).

Subjects taught:

a) Electric Machines and Drives, (EE 436), (Formerly Energy Conversion II).

b) Electromagnetic Fields and Waves, (EE 381).

c) Advanced Electric Machines and Drives, (EE 532).

d) Linear Circuits, (EE 221).

e) Computer-Aided Power Device and System Analysis, (EE 538).

f) Power System Protection, (EE 437).

g) Principles of Electrical Engineering, (EE 322).

h) Electrical Science, (ES 250).

3. 1972 to 1983, Virginia Polytechnic Institute and State University, Department of Electrical Engineering, as Assistant Prof.(1972-1977), Associate Prof.(1977-

1981), and Professor (1981-1983). Winner of a "Certificate of Teaching Excellence" during the 1979/1980 Academic Year.

Subjects taught:

a) Finite Element Analysis of Electromagnetic Fields in Electrical Devices, (Graduate Level)

b) Power System Stability, (Graduate Level)

c) Computer Methods in Power System Analysis, (Graduate Level)

d) Dynamic and Transient Analysis of Electrical Machines, (Graduate Level)

e) Electrical Transients in Power Systems, (Graduate Level)

f) Advanced Power System Analysis, (Graduate Level)

g) Energy Conversion (Electrical Machinery), (Senior Level)

h) Power Systems Fault Analysis and Protection, (Senior Level)

i) Power System Protection Lab, (Senior Level)

j) Energy Conversion Lab, (Senior Level)

k) Electromagnetic Fields, (Junior Level)

l) Electric Networks, (Junior Level)

m) Fundamentals of Electrical Engineering, (Junior Level)

n) Engineering Fundamentals, (Freshman Level)

o) Direct Energy Conversion, (Senior Level)

4. 1966 to 1968, University of Pittsburgh, School of Engineering, Electrical Engineering Department, Graduate Teaching Assistant.

5. 1964 to1966, Cairo University, Faculty (School) of Engineering, Demonstrator (Instructor - Problem Recitation Sessions and Laboratories).

1.2 <u>New Course Development</u>

1. "Electrical Transients in Power Systems," EE5340, Course proposed and developed by N.A. Demerdash at VPI&SU. Course first introduced about 1972/73.

2. "Finite Element Analysis of Electrical Devices," EE 5321 and EE 5322. Course sequence proposed and developed by N.A. Demerdash and T.W. Nehl, at VPI&SU. Courses first introduced, 1979/80.

3. "Dynamic Modeling of Electrical Machine Systems and Drives," EE 5351 and EE5352. Course sequence proposed and developed by N.A. Demerdash and T.W. Nehl, at VPI&SU. Courses first introduced, 1981/82.

4. Complete revision and redevelopment of EE532 "Advanced Electric Machines and Drives," new course content first introduced by N.A. Demerdash in 1988 at Clarkson University.

5. Complete revision and redevelopment of EE538 "Computer-Aided Power Device and System Analysis," new course content first introduced by N.A. Demerdash in 1987 at Clarkson University.

6. Special Topics Course EECE 183, "Adjustable Speed Drives for Industrial Applications", new course content first introduced in summer session II, 1995 by N.A. Demerdash at Marquette University.

7. "Design and Analysis of Electric Motors in Adjustable Speed Drives", EECE185, Course developed and proposed by N.A. Demerdash in 1997, Approved July 1997, first taught in Fall, 1998. (Now EECE 5210/ELEN 4210)

8. "Principles of Design of Power Systems Protection and Monitoring", EECE 186, Course developed and proposed by N.A. Demerdash in 1997, Approved July 1997, first taught in Spring Semester, 1999. (Now EECE 5240/ ELEN 4240).

9. "Electrical Transients and Surges in Power Systems and Devices", EECE 187, Course developed and proposed by N.A. Demerdash in 1997, Approved July 1997, first taught in Spring Semester, 2000. (Now EECE 5250/ ELEN 4250).

10. "Advanced Concepts in the Design and Modeling of Electric Machines and Drives," EECE 285, Course developed and proposed by N.A. Demerdash in 2001, first taught in Spring, 2002. (Now EECE 6260).

1.3 Continuing Education - Course Development and Teaching:

1. "Transient Performance of Power Systems," a course taught at the second annual and fourth annual two-week short course on "Computer Methods in Power System Modeling and Analysis", Sponsored by Florida Power and Light Company, Florida International University, and the Miami Section of the IEEE, Miami, Florida, August 10-21, 1987, and November 6-17, 1989.

2. "Finite Element Computer Aided Design in Electrical Engineering," a short course sponsored by MIAMI TECHNICON '87 - IEEE, Miami, Florida, Oct. 28-30, 1987.

3. "Finite Elements for Electromagnetic Applications," a four-day (formerly three-day) short course, Sponsored by Marquette University and endorsed by the

Milwaukee Section of IEEE, Milwaukee, WI, Spring, 1989, 1990, 1991, and 1992, 1993, 1994, 1995, 1996 and 1997.

4. "Finite Elements in Electromagnetics," a five-day short course workshop, Sponsored by Rensselaer Polytechnic Institute and endorsed by the Schenectady Section of IEEE, June 26-30, 1989, June 18-22, 1990, and June 24-28, 1991.

5. "Tutorial on: Adjustable Speed Drives", a one day short course tutorial, sponsored by the Power Engineering Society of IEEE, Feb. 3, 1993. Given at the 1993 Winter Meeting of the Power Engineering Society, Columbus, Ohio, Jan. 31-Feb. 5, 1993, and 1993 IEEE Summer Meeting of the Power Engineering Society, Vancouver, B.C., Canada, July 18-22, 1993, IEEE Tutorial Course Publication No. 92 EHO 362-4-PWR, pp. 86-108, pp 109-126.

6. "Tutorial 3-day course on: Single Phase Fractional HP-AC Motors and Drives", "Tutorial 3-day course on: Three-Phase Induction Motors and Drives" and "Tutorial 3-day course on: Three Phase AC Synchronous Generators," Developed and Delivered for the Technical Staff of MagnTek Corporation, April and June, 1995, respectively.

7. "Tutorial 3-days course on: Single Phase Fractional HP-AC Motors and Drives", "Tutorial 3-days course on: Three-Phase Induction and Motors and Drives" and "Tutorial 3-days course on: Three Phase AC Synchronous Generators," Developed and Delivered for the Technical Staff of A.O. Smith Corporation, August, 1995, and March 1996, respectively.

8. "Tutorial 2-day course on: Three-Phase Induction Motors and Drives", Developed and Delivered for the Technical Staff of A.O. Smith Corporation, Tipp City, Ohio, August 1997.

9. "Optimal Design and Simulation of Brushless PM Machines and Drives", a two-day joint short course by ANSYS Corporation and Marquette University, sponsored by ANSYS Corporation, Milwaukee, WI, June 22-23, 2011.

10. "Power Electronics and Renewable Energy Design", a three-day joint short course by ANSYS Corporation and Marquette University, sponsored by ANSYS Corporation, Milwaukee, WI, September 14-16, 2011.

11. "Optimal Design, Condition Monitoring and Fault Tolerance of Electric Machines and Drives", a three-day joint short course by ANSYS Corporation and Marquette University, sponsored by ANSYS Corporation, Milwaukee, WI, June 6-8, 2012.

1.4 Research Direction and Participation:

1.4.1 Awarded Research Contracts and Grants:

1. Recipient of a $23,987.00 NASA-Johnson Space Center Research Contract to Investigate the "Dynamic Modeling of Brushless DC Motors for Aerospace Applications," 1976-1977. (Principal Investigator: N. A. Demerdash).

2. Recipient of a $ 24,266.00 Middle Atlantic Committee on Power Engineering Education (A Consortium of Middle Atlantic Electric Utilities) Research Grant to Investigate "A New Approach to Dynamic and Transient Power System Stability," 1976-1977, with emphasis on detailed non-linear generator modeling. (Principal Investigator: N. A. Demerdash, Co-P.I.: L.L.Grigsby).

3. Recipient of about $90,000.00 SCEE/USAF - Aero-propulsion Lab Research Contract to Develop "Generalized Two Dimensional Finite Element Numerical Models for Determination of Magnetic Fields in Electrical Machinery," 1977-1983. (Principal Investigator: N. A. Demerdash).

4. Recipient of a $135,000.00 NASA Lewis/DOE Research Contract to Develop, Design and Build a Fundamental Model of a "Brushless DC Motor for Use in Electric Vehicle Propulsion", Phase (I) 1978-79 (Principal Investigator: N.A. Demerdash, Faculty Associate: Dr T.W. Nehl), Inland Motor Div., Radford, VA, Subcontractor for Hardware Construction and Testing.

5. Recipient of a $340,000.00 NASA Lewis/DOE Research Contract to Develop, Design and Build Samarium Cobalt Based and a Strontium Ferrite Based Engineering Models of "Improved Transistor Controlled and Commutated Brushless DC Motor for Electric Vehicle Propulsion," Phase (II), 1979-1982. (Principal Investigator: N. A. Demerdash, Co-PI's: Drs. T.W. Nehl and R.H. Miller), Inland Motor R&D Center, the Industrial Drives Division of Kollmorgen Corporation Radford, VA, Subcontractor for Hardware Construction and Testing

6. Recipient of a $35,000.00 Ford Motor Company, Electrical and Electronics Division Contract for "Development of a Finite Element Formulation and Solution Algorithm of Three Dimensional Magnetic Field Problems in Electromagnetic Devices," 1979-80. (Principal Investigator: N.A. Demerdash, Co-PI: Dr. T.W. Nehl).

7. Co-recipient of $70,900.00 Westinghouse Electric Corp. Contract on "Dynamic Modeling of Brushless Excitation Systems for Large Turbine Generators," 1980-81. (Principal Investigator: T.W. Nehl, Co-P.I.: N.A. Demerdash).

8. Co-recipient of $100,000.00 NASA-JSC Contract on "Failure Mode Dynamic Modeling of Brushless DC Motors for Electromechanical Actuators,"1981-83. (Principal Investigator: T.W. Nehl, Co-P.I.: N.A. Demerdash).

9. Recipient of a $34,575.00 Sundstrand Corporation, Aviation Operations Contract for "Dynamic Analysis of Permanent Magnet Generators with Different Rotor Configurations," 1985-1987. (Principal Investigator: N.A. Demerdash).

10. Recipient of $282,000.00 NASA (Lewis Research Center) Grant for "Computer-Aided Modeling and Prediction of Performance of the Modified Lundell Class of Alternators in Space Station Solar Dynamic Power Systems," $85,000.00 for 1987-88, $90,000.00 for 1988-89, $107,000.00 for 1989-91.

11. Co-recipient of $366,552.00 NASA (Lewis Research Center) Grant for "Analysis of Electromagnetic Interferences from Power Systems Processing and Transmission Components of the Space Station," $149,000.00 for Jan.1 - Sept.30, 1990, Remainder for Oct. 1, 1990-Dec. 31, 1991. (Co-PI's: P.W. Barber and N.A. Demerdash).

12. Recipient of a $35,954.00 Sundstrand Corporation, Aviation Operations Contract for "Finite Element Investigation of the Pole Face Losses in a High Speed Generator Designed for Aerospace Applications," April 1, 1990-May 31, 1991.

13. Recipient of a $37,000.00 Sopark Corporation Contract on Development of "Computer-Aided Modeling for Design of Induction Motor Drives Using Finite Element Magnetic Field Analysis and Network Graph Analysis Techniques", Sept.1, 1990 - Dec. 31, 1991.

14. Recipient of a $11,742.00 Sundstrand Corporation, Aviation Operations Contract for "Finite Element Computation of Parameters and Performance of High Speed Salient Pole Synchronous Machines for Aerospace Applications," May 1, 1991 - Feb. 29, 1992.

15. Recipient of a $29,800.00 Sundstrand Corporation, Aviation Operations Contract for "Study of the Influence of Unbalanced Operation on Losses in High Speed Salient Pole Synchronous Machines by Finite Element", Sept. 1, 1991- August 31, 1992.

16. Co-recipient of a $58,366.00 General Motors Corporation/Delphi Systems Grant on "Synchronous Reluctance Machine Performance Using Coupled Finite Element-State Space Algorithms", March 1, 1996 - August 31, 1997. (P.I.: A.A Arkadan, Co-P.I: N. A. Demerdash).

17. Co-recipient of a $51,893.00 A.O. Smith Corporation Grant for a project on "Evaluation of Core Losses in Poly-Phase Induction and Switched Reluctance Motor Drives", August 1, 1996 - July 31, 1997.

18. Recipient of a $13,822.00 Equipment Grant Donated by Rockwell Automation/Allen Bradley Corp. for the Electric Machines and Drives Research Laboratory under the Direction of Professor Demerdash, September 1997.

19. Recipient of a $3,000.00 Cash Grant Donated by Rockwell Automation/Allen Bradley Corp. for the Electric Machines and Drives

Research Laboratory under the Direction of Professor Demerdash, September 1997.

20. Co-recipient of a $340,000.00 NSF Grant for "A Novel Approach to Fault Modeling, Diagnostics and Prediction in Motor Drive Systems", from Sept. 1, 2003 through August 31, 2006, plus 3 REU supplements of 18,000 (with R.J. Povinelli (PI), and E.E. Yaz (Co-PI)).

21. Recipient of a $26,500.00 NSF-USAID Grant for an "On-Line Fault Diagnostics for Induction Motor Drive Systems Through Electronic Signal and Artificial Intelligence Techniques", from October 1, 2006 through December 31, 2007.

22. Recipient of a $26,000 SWETRC/DOE Grant titled, "New Energy Storage Technologies and Power Converter Topologies for Wind Turbines," from January 1, 2010 through December 31, 2010.

23. Recipient of a $21,000 A.O. Smith Corporation Grant titled, "Design Synthesis and Optimization of Permanent Magnet Brushless DC and Synchronous Motors and Drives, Application to IPM Motors," from September 1, 2009 through August 31, 2010.

24. Recipient of a $25,000 A.O. Smith Corporation Grant titled, "Design Synthesis and Optimization of Permanent Magnet Brushless DC and Synchronous Motors and Drives, Application to IPM Motors," from September 1, 2010 through August 31, 2011.

25. Recipient of a $90, 000 WERC Grant titled, "Novel Protection Means for PM Machines in Wind Energy Generation and Hybrid-Electric Vehicle Applications," from June 18, 2010 through June 18, 2011.

26. Recipient of a $27, 000 (share of N.A. Demerdash) WERC Grant titled, "DC Distribution for Wind Farms to Achieve Higher Efficiency and Reliability and Lower Cost," from Jan. 1, 2011 through Dec. 31, 2011.

27. Recipient (with Dr. Dan Ionel's help) of 5 ANSYS software licenses worth more than $1,000,000 on the open Software Market from Aug. 2010 to Present.

28. Recipient of a $425, 000 NSF-GOALI Grant titled, "Intelligent Systems for Health Condition Prognostics in AC Permanent Magnet and Induction Machine Drives for Highly Efficient and Renewable Energy Utilization," from September 15, 2010 through August 31, 2015.

29. Recipient of a $175, 823.64 Regal-Beloit Corporation Grant titled, "Advanced Design Optimization and Simulation of Modular Brushless PM Electric Machines and Drives," from August 16, 2011 through December 31, 2013.

30. Recipient of a $29, 166 UMN-DOE Grant titled, "A Nationwide Consortium of Universities to Revitalize Electric Power Engineering Education by State-of-the art Laboratories," July 30, 2010 through July 29, 2013.

31. Recipient of an $87, 833 General Motors Corp. Grant titled "Rapid Finite Element-Based Simulation and Optimization of Electric Machines," from January 1st through December 31, 2014.

32. Recipient (with Dr. Dan M. Ionel, Co-PI) of a $75, 000 M-WERC Grant titled "Modeling and Design Optimization of High Efficiency Permanent Magnet Machine Drive Systems," from February 1, 2014 through Jan 31, 2015.

33. Co-Founder, with Dr. Dan Ionel, of SEMPEED Consortium in 2015, with an annual revenue from four member corporations totaling $77,500 per year.

1.4.2 Graduate Student Research Supervision and Direction:

1. Supervised and directed to successful conclusion 20 Ph.D. dissertations, presently 3 Ph.D. dissertations are in progress. See Section (8.1) for details.

2. Supervised and directed to successful conclusion 31 M.S. thesis, and 3 M.E. projects. See Section (8.2) for details.

1.5 Departmental and University Committee Services:

1. Served on the graduate committee of the Electrical Engineering Department, Virginia Polytechnic Institute and State University (3 academic years).

2. Served on the faculty search committee of the Electrical and Computer Engineering Department, Clarkson University (2 academic years).

3. Served on the graduate policies committee of the Electrical and Computer Engineering Department, Clarkson University, 1987-1992.

4. Served on the Chairperson Search Committee for a Mathematics and Computer Science Department Chair, School of Science, Clarkson University, 1993.

5. Serving on the Electrical and Computer Engineering Department, Marquette University, Promotion and Tenure/Full Professors, and the Graduate Committees, 1997-present.

6. Service on the College of Engineering, Marquette University, Promotion and Tenure Committee, 2008-2009, and 2016-2017.

2.0 INDUSTRIAL EXPERIENCE:

2.1 Full Time (Permanent) Employment with the Electric Power Industry: 1968-1972, Westinghouse Electric Corporation, Large Rotating Apparatus Division - Development Engineering Department, Electrical Section, East Pittsburgh, PA.

Position: Development Engineer

Type of Work: Computerized Simulation of Electromagnetic Field Phenomena and Associated Problems in Rotating Machinery. This includes solution of static as well as time varying electromagnetic field problems by finite difference and other techniques. Design of large turbo-generators (1000MVA) including thermal and heat transfer problems of cooling hydrogen inner-cooled and water-hydrogen –cooled generators. Experience with preliminary designs of the first Westinghouse cryogenic generator. Specifically: 1) Experience with magnetic field determination by means of digital simulation in turbo-generators, including machines with new asymmetrical rotor designs. 2) Experience with mechanical forces on commutating pole windings in d.c. motors during flashovers, determined from magnetic field digital simulation. 3) Experience with determination of steel damper bar eddy currents, losses and equivalent circuit representation during starting and transient disturbances in large pumped-storage type hydroelectric generators. 4) Experience with standard and specialized shop floor testing of large turbo-generators of over 600 MVA capacity. 5) Experience with exploratory designs of large water cooled single shaft turbo-generators of over 1700 MVA capacity. 6) End winding forces and end winding losses in turbo-generators. 7) Experience with heat transfer and thermal calculations using digital simulation techniques applicable to turbo-generators. 8) Experience with force calculations on field and stator windings of the first Westinghouse cryogenic turbo-generator. 9) Experience with matrix sparsity techniques for digital solution of nonlinear diffusion and Poisson type partial differential equations, in large electromagnetic field problems. 10) Experience in classical techniques of solving electrical machine transients.

2.2 Full Time (Summer) Employment with Other Industries:

1. Summer 1985. Lewis Research Center of the National Aeronautics and Space Administration, Cleveland, Ohio - Power System Management and Distribution Branch - Space Station.

   Position: NASA Visiting Scientist (Summer Research Fellow)

   Type of Work: Model Development and Simulation of Parallel Operation of Modified Lundell Alternators (1200 Hz.) for Solar Dynamic Power Systems for the Space Station.

2. Summer 1976. Johnson Space Center of the National Aeronautics and Space Administration, Houston, TX - Control Systems Development Division.

   Position: NASA Visiting Scientist (Summer Research Fellow)

   Type of Work: 1) Development of Analytical Modeling Techniques for Analysis of Rare-Earth Permanent Magnet Machines with 3-Phase Stator Windings Connected to Solid-State Power Conditioners (Inverters and Converters) for Aerospace Control and Other Applications. 2) Modeling and Determination of Performance Characteristics of Aerospace Type Induction Motors when Operated from Solid-State Inverters with Non-sinusoidal Output Waveforms.

3. Summer 1975. Johnson Space Center of the National Aeronautics and Space Administration, Houston, TX - Control Systems Development Division.

Position: NASA Visiting Scientist (Summer Research Fellow)

Type of Work: Investigation of the Effect of Severe Space Environment and Abnormal Operating Conditions on Characteristics of Induction Motors Aboard the Space Shuttle Orbiter.

2.3 Industrial Training (Summer) with the Electric Power Industry:

English Electric Company (England) Liverpool Works - Summer of 1962 (June-Oct.) and Stafford works - Summer of 1963 (June-Oct.).

Position: Engineering Student Apprentice

Type of Work: Practical engineering training in manufacturing and testing of switchgear equipment, transformers and rotating machinery.

3.0 CONSULTING:

1. General Motors Research Labs, Warren, Michigan, on Nonlinear Eddy Current Problems in Electrical Machinery - 1978.

2. Honeywell Avionics Division, St. Petersburg, Florida, on Electromechanincal Actuators and Brushless DC Machines - 1979/80.

3. Sundstrand Avionics Dept., Rockford, Illinois, on Dynamic Modeling and Finite Element Analysis of Electronically Operated Machines - 1980 and 1986-1997.

4.0 MEMBERSHIP AND ACTIVITIES IN PROFESSIONAL SOCIETIES, ETC.:

1. Life-Fellow of IEEE (2009), Fellow of IEEE (1990) with a citation "For contributions to the application of finite element analysis to electrical machine design," "Senior member of IEEE (1974), Member of IEEE (1965), Member of the following IEEE Societies: Power and Energy Society, Magnetics Society (1973-2010), Industry Applications Society, Electrical Engineering Education Society, Aerospace and Electronic Systems Society (1973-2010), Power Electronics Society.

2. Member of ASEE, Eta Kappa Nu and Sigma Xi.

3. Member of the IEEE Nikola Tesla Award Committee, 2003-2006, 2008-2009.

4. Chairman of the IEEE Nikola Tesla Award Committee, 2006-2008.

5. Service from 1978 to 2007 as a member of the Electric Machinery Committee (EMC) (formerly the Rotating Machinery Committee) of the IEEE-Power Engineering Society (An international body of experts on electric machinery and drive systems who are responsible for Electric Machinery and Drive Systems Testing, Design and Construction

Standards, as well as an editorial body for The IEEE Transactions on Energy Conversion).

6. Service from 1972 to 2007 as member (past secretary, then Vice-Chairman 1977-78 and 1979-80, respectively) of the Synchronous Machinery Subcommittee of EMC/IEEE-Power Engineering Society. (An international body of experts on Synchronous Machines and Drive Systems - Responsibilities: Standards for Synchronous Machines and Drive Systems Testing, Analysis and Construction, Paper Reviews for The IEEE Transactions on Energy Conversion), and Chairman of that subcommittee's working group on Awards and Recognitions from 1974 to 1994.

7. Service from 1973 to 2007 as Member of the Electric Machinery Theory Subcommittee of EMC/IEEE-Power Engineering Society. Secretary of the subcommittee, 1987-1991, Vice-Chairman of Subcommittee 1991-1993, Chairman of Subcommittee 1994-1997. (An international body of experts on Theory of Electric Machinery and Drive Systems, Paper Reviews for The IEEE Transactions on Energy Conversion).

8. Service from 1981 to 2007 as member of the DC and Permanent Magnet Machinery Subcommittee (formerly the DC Machinery Subcommittee) of EMC/IEEE-Power Engineering Society, Chairman of this subcommittee, 1988-1992, Vice-Chairman of this Subcommittee's Technical Working Group on Development of a "Guide for Test Procedures for Chopper Controlled DC Motors" (Responsibilities: Standards for DC and Permanent Magnet Machinery and Drive Systems Testing, Analysis and Construction, Paper Reviews for The IEEE Transactions on Energy Conversion).

9. Chairman of the "Joint Working Group of the Electric Machinery Committee of PES/IEEE and the Electric Machines Committee of IAS/IEEE" on the Establishment of an IEEE-International Electric Machines and Drives Conference (IEMDC), and an Energy Conversion Council (ECC) of IEEE to be initially sponsored by the Power Engineering and Industry Applications Societies of IEEE, 1992-1994. IEEE-IEMDC is now an established IEEE-International Conference (1997, 1999, 2001, 2003, 2005, 2007 and 2009).

10. Chairman (1993-94) of a Working Group of the Electric Machinery Committee (EMC) of PES-IEEE on "Reform of the Process by which EMC Evaluates Nomination Forms (B-27) of IEEE Fellow Grade Candidates Referred to it by the PES Fellows Committee," Chairing it's Teller Working Group on the IEEE Fellow Nomination Evaluation Process, 1993-1994.

11. Served as Member of the Continuing Power Engineering Education Subcommittee, of the Power Engineering Education Committee, IEEE - Power Engineering Society, 1984-92.

12. Service from 1979-1985 as Member of the Motor Controls Committee of the Industrial Electronics and Control Instrumentation Society, IEEE. Editorial duties in Paper Reviews for the IEEE Transactions of this Society.

13. Regular reviewer for The IEEE Transactions on Magnetics.

14. Co-Chaired a Session on "Eddy Currents and Magnetic Field Calculations" at the 1981 International Magnetics Conference, INTERMAGE-81, March 12-15, 1981, Grenoble, France.

15. Invited to Chair a Session on "Motor Control" at the 1981 International Conference on Industrial Control and Electronics, ICEI-81, Nov. 9-13, 1981, San Francisco.

16. Chaired a session on "Excitation and Resonances, Sensors, and Numerical Techniques" at the 1982 Joint International Magnetics - MMM Conference, INTERMAG-82, July 20-23, 1982, Montreal, Canada.

17. Chaired a session on "Electric Machinery and Devices "at the Workshop on Electromagnetic Field Computation, Oct. 20-21, 1986, Schenectady, New York.

18. Chaired a session on "DC and Permanent Magnet Machines - Analysis and Application" at the 1987 IEEE-Power Engineering Society Winter Meeting, Feb.1-6, 1987, New Orleans, Louisiana.

19. Chaired a session on "Saturation Effects in Rotating Machinery Analysis" at the 1989 IEEE - Power Engineering Society Winter Meeting, Jan.31-Feb.3, 1989, New York, New York.

20. Chaired a session on "DC and Permanent Magnet Machinery Drives" at the 1989 IEEE-Power Engineering Society Winter Meeting, Jan.29-Feb.3, 1989, New York, New York.

21. Chaired a session on "Rotating Machinery" at the 1990 IEEE Power Engineering Society Winter Meeting, Feb. 4-8 1990, Atlanta, Georgia.

22. Co-Chaired a session on "Electromagnetics" at the 1990 International Magnetics Conference, INTERMAG-90, April 17-20, 1990 Brighton, England, UK.

23. Chaired a session on "Magnetostatics, Micromagnetics and Materials" at the 1990 Fourth Biennial IEEE Conference on Electromagnetic Field Computation, CEFC'90, October 22-24,1990, Toronto, Canada.

24. Organized and Chaired a Panel Session on "Impact of Super-Computers on the Analysis and Design of Electrical Machinery", at the 1991 IEEE- Power Engineering Society Winter Meeting, Feb. 3-7, 1991, New York, New York.

25. Co-Chaired a session on "Formulations" at the 1992 Fifth Biennial IEEE Conference on Electromagnetic Field Computation, CEFC '92, August 3-5, 1992, Claremont, CA.

26. Chaired a session on "Induction Machine Analysis and Control", at the 1993 IEEE-Power Engineering Society Winter Meeting, Jan. 31-Feb. 5, 1993, Columbus, Ohio.

27. One of the Three Plenary Session Key Note Speakers at the 1999 IEEE-International Electric Machines and Drives Conference (IEMDC-99), Seattle, Washington, June, 1999.

28. Chaired a session on "Acoustics and Vibrations" at the 2003 IEEE-International Electric Machines and Drives Conference (IEMDC-2003), Madison, Wisconsin, June 1-4, 2003.

29. Past Secretary, Vice Chairman, as well as Chairman of the Virginia Mountain Section of IEEE, 1978/79,79/80 and 80/81, respectively.

30. Past Secretary, Vice Chairman, as well as Chairman of the Industrial Applications Chapter of the Virginia Mountain Section of IEEE, 1975/76, 76/11 and 77/78, respectively.

31. Service from 1979 to 1983 on the editorial board of The International Journal of Electric Machines and Electromechanics - An International Quarterly, publisher: Hemisphere Publishing Corporation.

32. Reviewer of Research Proposals for NSF on Energy and Electromechanical Energy Conversion Related Topics.

33. Reviewer of book manuscript for several U.S. publishers.

5.0 LIST OF PUBLICATION OF NABEEL A.O. DEMERDASH:

5.1 Papers in Refereed Archival Journals:

1. Demerdash, N.A., Hamilton, H.B and Brown, G.W., "Simulation for Design Purposes of Magnetic Fields in Turbogenerators with Symmetrical and Asymmetrical Rotors - Part I: Model Development and Solution Techniques," IEEE Transactions on Power Apparatus and Systems, Vol. PAS-91, 1972, pp. 1985-1992.

2. Demerdash, N.A., Hamilton, H.B and Brown, G.W., "Simulation for Design Purposes of Magnetic Fields in Turbogenerators with Symmetrical and Asymmetrical Rotors - Part II: Model Calibration and Applications", IEEE Transactions on Power Apparatus and Systems, Vol. PAS-91, 1972, pp. 1992-1999.

3. Demerdash, N.A. and Hamilton, H.B., "Effect of Rotor Asymmetry on Field Forms and Eddy Current Losses in Stator Conductors Due to Radial Flux." IEEE Transactions on Power Apparatus and Systems, Vol. PAS-91, 1972, pp. 1999- 2010

4. Demerdash, N.A. and Gillott, D.H., "A new Approach for Determination of Eddy Currents and Flux Penetration in Nonlinear Ferromagnetic Materials," IEEE Transactions on Magnetics, Vol. MAG-10, 1974, pp. 682-685.

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56. G. Y. Sizov, C-C. Yeh, and N. A. O. Demerdash, "Magnetic Equivalent Circuit Modeling of Induction Machines Under Stator and Rotor Fault Conditions," Conference Proceedings of the International Electric Machines and Drives Conference (IEMDC), 2009, Miami, USA, May 3-6, 2009.

57. G. Y. Sizov, D. M. Ionel, and N. A. O. Demerdash, "Modeling and Design Optimization of PM AC Machines Using Computationally Efficient - Finite Element Analysis," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), 2010, pp. 578–585, Sep.12-16, 2010.

58. A. Sayed-Ahmed, B. Mirafzal, and N. A.O. Demerdash, "A Fault-Tolerant Technique for Δ-Connected Vector-Control AC-Motor Drives," IEEE Applied Power Electronics Conference and Exposition (APEC), 2011, pp.1034-1041, March 6-11, 2011.

59. A. Sayed-Ahmed, B. Mirafzal, and N. A.O. Demerdash, "Continued Operation of Delta-Connected AC Motor-Drive Systems Under Short-Circuit Fault," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2011, pp.669-674, May15-18, 2011.

60. P. Zhang, G. Y. Sizov, N. A.O. Demerdash, "Comparison of Torque Ripple Minimization Control Techniques in Surface-Mounted Permanent Magnet Synchronous Machines," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2011, pp.188-193, May15-18, 2011.

61. G. Y. Sizov, D. M. Ionel, and N. A. O. Demerdash, "Multi-Objective Optimization of PM AC Machines Using Computationally Efficient - FEA and Differential Evolution," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2011, pp.1528-1533, May15-18, 2011.

62. S. Suo, G. Y. Sizov, A. Sayed-Ahmed, and N. A.O. Demerdash, "Modeling and Experimental Validation of a Fault Mitigation Method in Induction Motor-Drive Systems Using a Magnetic Equivalent Circuit," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2011, pp. 699-704, May 15-18, 2011.

63. G. Y. Sizov, D. M. Ionel, N. A. O. Demerdash, "A Review of Efficient FE Modeling Techniques with Applications to PM AC Machines," Conference Proceedings of IEEE Power and Energy Society General Meeting, 2011, July 24-29, 2011.

64. A. Kadaba, S. Suo, G. Y. Sizov, C-C. Yeh, and N. A.O. Demerdash, "Design and Modeling of a Reversible 3-Phase to 6-Phase Induction Motor for Improved Survivability," Conference Proceedings of IEEE Power and Energy Society General Meeting, 2011, July 24-29, 2011.

65. J. He, G. Y. Sizov, P. Zhang, and N. A. O. Demerdash, "A Review of Mitigation Methods for Overvoltage in Long-Cable-Fed PWM AC Drives," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), 2011, pp. 2160–2166, Sep.17-22, 2011.

66. G. Y. Sizov, P. Zhang, D. M. Ionel, and N. A. O. Demerdash, "Automated Bi-Objective Design Optimization of Multi-MW Direct-Drive PM Machines Using CE-FEA and Differential Evolution," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), 2011, pp. 3672–3678, Sep.17-22, 2011.

67. G. Y. Sizov, P. Zhang, D. M. Ionel, N. A. O. Demerdash, I. P. Brown, and M. G. Solveson, "Modeling and Analysis of Effects of Skew on Torque Ripple and Stator Tooth Forces in Permanent Magnet ac Machines," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), 2012, pp. 3055–3061, Sept. 2012.

68. P. Zhang, G. Y. Sizov, J. He, D. M. Ionel, and N. A.O. Demerdash, "Calculation of Magnet Losses in Concentrated-Winding Permanent Magnet Synchronous Machines Using a Computationally Efficient - Finite Element Method," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), 2012, pp. 3363–3370, Sept. 2012.

69. X. Jing, J. He, N. A. O. Demerdash, "Application and Losses Analysis of ANPC Converters in Doubly-fed Induction Generator Wind Energy Conversion System,"Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2013, pp. 131-138, May 12-15, 2013.

70. N. Huang, J. He, N. A. O. Demerdash, "Sliding Mode Observer Based Position Self-Sensing Control of a Direct-Drive PMSG Wind Turbine System Fed by NPC Converter," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2013, pp. 131-138, May 12-15, 2013.

71. J. He, A. Strandt, A. Manarik, P. Zhang, and N. A.O. Demerdash, "Diagnosis of Stator Short-Circuit Faults in an IPM Synchronous Machine Using Space-Vector Pendulous Oscillation Method," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2013, pp. 793-799, May 12-15, 2013.

72. P. Zhang, G. Sizov, D. M. Ionel, and N. A.O. Demerdash, "Design Optimization of Spoke-Type Ferrite Magnet Machines by Combined Design of Experiments and Differential Evolution Algorithms," Conference Proceedings of IEEE International Electric Machines and Drives Conference (IEMDC), 2013, pp. 958–964, May 12-15, 2013.

73. P. Zhang, G. Y. Sizov, M. Li, D. M. Ionel, N. A.O. Demerdash, S. Stretz, and A. W. Yeadon, "Multi-Objective Tradeoffs in the Design Optimization of a Brushless Permanent Magnet Machine with Fractional-Slot Concentrated Windings," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), Denver, CO, pp. 2842-2849, Sep.15-19, 2013.

74. P. Zhang, D. M. Ionel, and N. A.O. Demerdash, "Morphing Parametric Modeling and Design Optimization of Spoke and V-Type Permanent Magnet Machines by Combined Design of Experiments and Differential Evolution Algorithms," Conference Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), Denver, CO, pp. 5056-5063, Sep.15-19, 2013.

75. X. Jing, J. He, and N. A. O. Demerdash, "Loss Balancing SVPWM for Active Neutral-Point-Clamped Multilevel Converters," Conference Proceedings of IEEE Applied Power Electronics Conference and Exposition (APEC 2014), Fort Worth, TX, pp. 281-288, Mar.16-20, 2014.

76. M. Li, J. He, and N.A.O. Demerdash, "A Flux-Weakening Control Approach for Interior Permanent Magnet Synchronous Motors Based on Z-Source Inverters," Conference Proceedings of 2014 IEEE Transportation Electrification Conference and Expo (ITEC 2014), Dearborn, MI, pp. 1-6, June 15-18, 2014.

77. J. He and N.A.O. Demerdash, "Diagnosis of Open-Circuit Switch Faults in Multilevel Active-NPC Inverters," Conference Proceedings of 2014 IEEE Transportation Electrification Conference and Expo (ITEC 2014), Dearborn, MI, pp. 1-6, June 15-18, 2014.

78. J. He, C. Somogyi, A. Strandt, and N.A.O. Demerdash, "Diagnosis of Stator Winding Short-Circuit Faults in an Interior Permanent Magnet Synchronous Machine," Conference Proceedings of 2014 IEEE Energy Conversion Congress and Exposition (ECCE 2014), Pittsburgh, PA, pp. 3125-3130, Sep.14-18, 2014.

79. J. He, T. Zhao, X. Jing, and N.A.O. Demerdash, "Application of Wide Bandgap Devices in Renewable Energy Systems - Benefits and Challenges," Conference Proceedings of 2014 International Conference on Renewable Energy Research and Applications (ICRERA 2014), Milwaukee, WI, Oct. 19-22, 2014.

80. J. He, A. Fatemi, N.A.O. Demerdash, and D. M. Ionel, "Diagnosis of Stator Short-Circuit Faults in Series and Parallel Winding Connections of Current-Controlled Permanent Magnet Synchronous Machines," Conference Proceedings of 2015 IEEE International Electric Machines and Drives Conference (IEMDC), Idaho, May 2015.

81. A. Fatemi, D. M. Ionel, and N. A. O. Demerdash, "Identification of Design Rules for Interior PM Motors with Different Cooling Systems," Conference Proceedings of 2015 IEEE International Electric Machines and Drives Conference (IEMDC), Idaho, pp. 1228-1234, May 2015.

82. A. Fatemi, N. A. O. Demerdash, and D. M. Ionel, "Design Optimization of IPM Machines for Efficient Operation in Extended Speed Range," Conference Proceedings of 2015 IEEE Transportation Electrification Conference and Expo (ITEC), Detroit, MI, pp. 1-8, June 2015.

83. A. Fatemi, D. M. Ionel, N. A. O. Demerdash and T. W. Nehl, "Fast Multi-Objective CMODE-Type Optimization of Electric Machines for Multicore Desktop Computers,"

Conference Proceedings of 2015 IEEE Energy Conversion Congress and Exposition (ECCE), Montreal, Canada, pp. 5593-5600, September 2015.

84. A. Fatemi, N. A. O. Demerdash, T. W. Nehl and D. M. Ionel, "Large-Scale Electromagnetic Design Optimization of PM Machines Over a Target Operating Cycle," Conference Proceedings of 2015 IEEE Energy Conversion Congress and Exposition (ECCE), Montreal, Canada, pp. 4383-4390, September 2015.

85. J. He, L. Wei, and N.A.O. Demerdash, "Power Cycling Lifetime Improvement of Neutral-Point-Clamped Inverters Used in Adjustable Speed Drives," Conference Proceedings of 2016 IEEE Applied Power Electronics Conference and Exposition (APEC), Long Beach, CA, March 2016.

86. J. He, N. Weise, L. Wei, and N.A.O. Demerdash, "A Fault-Tolerant Topology of T-Type NPC Inverter with Improved Thermal Overload Capability," Conference Proceedings of 2016 IEEE Applied Power Electronics Conference and Exposition (APEC 2016), Long Beach, CA, March 2016.

87. J. He and N.A.O. Demerdash, "An On-Line Diagnostic Method of Open-Circuit Switch Faults in Neutral-Point-Clamped Converters," Conference Proceedings of 2016 IEEE Energy Conversion Congress and Exposition (ECCE), Milwaukee, WI, 2016.

88. J. He, N. Weise, R. Katebi, L. Wei, and N.A.O. Demerdash, "A Fault-Tolerant T-Type Multilevel Converter Topology with Soft-Switching Capability based on Si and SiC Hybrid Phase Legs," Conference Proceedings of 2016 IEEE Energy Conversion Congress and Exposition (ECCE), Milwaukee, WI, 2016.

89. A. Fatemi, D. Ionel, M. Popescu, and N.A.O. Demerdash, "Design Optimization of Spoke-Type PM Motors for Formula E-Racing Cars," Conference Proceedings of 2016 IEEE Energy Conversion Congress and Exposition (ECCE), Milwaukee, WI, 2016.

90. A. Fatemi, D. Ionel, N.A.O. Demerdash, D. Staton, R. Wrobel, and C.Y. Chuan, "A Computational Efficient Method for Calculation of Strand Eddy Current Losses in Electric Machines," Conference Proceedings of 2016 IEEE Energy Conversion Congress and Exposition (ECCE), Milwaukee, WI, 2016.

91. A. Fatemi, D. Ionel, N.A.O. Demerdash, S. Stretz, and T. Jahns, "RSM-DE-ANN Method for Sensitivity Analysis of Active Material Cost in PM Motors," Conference Proceedings of 2016 IEEE Energy Conversion Congress and Exposition (ECCE), Milwaukee, WI, 2016.

5.5 Papers in Regional Conferences Published in Proceedings:

92. Demerdash, N.A. and Hamilton, H.B., "Flux Distribution Under Load for Turbo generators with Asymmetrical Rotors," Annual IEEE - Southeast Conference Proceedings, Louisville, Kentucky, April 30- May 2, 1973, pp.U.5-1 - U.5-7.

93. Grigsby, L.L., Garg, V.K and Demerdash, N.A., "Power System State Models for Dynamic Fault Studies," Annual IEEE - Southeast Conference proceedings, Orlando, Florida, April 29- May 1, 1974, pp. 533-547.

94. Demerdash, N.A and Garg, V.K., "Numerical Determination of Flux Penetration in Solid Ferromagnetic Parts of Power Apparatus," Annual IEEE-Southeast Conference Proceedings, Orlando, Florida, April 29- May 1, 1974, pp. 560-564.

95. Grigsby, L.L., Garg, V.K. and Demerdash, N.A., "A New Approach to Power Systems Transient Fault Analysis," Annual IEEE-Southeast conference Proceedings, Vol. 2, Charlotte, North Carolina, April 7-9, 1975, pp. ID6.1-ID.6.5.

96. Grigsby, L. L., Garg, V.K. and Demerdash, N.A., "A New Approach to Power Systems Transient Fault Analysis," Annual IEEE - Southeast Conference Proceedings, Vol. 2, Charlotte, North Carolina, April 7-9, 1975, pp. 4B 3.1-4B.3.6.

97. Grigsby, L.L., Garg, V.K and Demerdash, N.A., "A Sampled Data Approach to the Transient Faulty Analysis of Saturated Synchronous Machines," Conference Proceedings of the Southeastern Symposium on Systems Theory, Paper No. D.2, Auburn, Alabama, March 20-21, 1975.

98. Grigsby, L.L., Garg, V.K, Demerdash, N.A. and Nehl, T.W., "Transient and Dynamic Stability- Past, Present and Future," Proceedings of the Control of Power Systems Conference, IEEE Publication No. 76CH1057-9 REG. 5, Oklahoma City, Oklahoma, March 10-12, 1976, pp. 118-123.

99. Garg, V.K. and Demerdash, N.A., "A Variable Gain Sampled Data Approach to Torque-Speed Characteristics of Saturated Induction Motors," Proceedings of the Annual IEEE - Southeast Conference, Clemson, South Carolina, April 1-3, 1976, pp.1-9.

100. Demerdash, N.A. and Garg, V.K., "State Model for Digital Simulation of Transients on E.H.V. Transmission Systems Including Nonlinearities," Proceedings of the Annual IEEE - Southeast Conference, Clemson, South Carolina, April 5-7, 1976, pp.162-164.

101. Demerdash, N.A. and Nehl, T.W., "A Simplified Approach to Modeling and Determination of Characteristics of Induction Motors Operating from Solid State Inverters for Industrial Drives," Proceedings of the IEEE - Southeast Conference, Williamsburg, Virginia, April 4-6, 1977, pp. 5-8.

102. Demerdash, N.A., Shah, M.R. and Grigsby, L.L., "Simulation of Transients of H.V. Transmission Lines with Nonlinearities Using State-Space Approaches," Proceedings of the IEEE - Southeast Conference, Williamsburg, Virginia, April 4-6,1977, pp.173-176.

5.6 Major Industrial Technical Reports:

1. "Description of Inter-Pole Forces for D.C. Machines with Presentation of Results," Large Rotating Apparatus Divisions, Westinghouse Electric Corporation, LRA Memo No. 408, by King, E.I. and Demerdash, N.A.

2. "Theory of Simulation of Turbine-Generators," Large Rotating Apparatus Division, Westinghouse Electric Corporation, LRA Memo No. 471, by Demerdash, N.A.

3. "Calibration of Magnetic Vector Potential Simulation Models of Turbine-Generators by Shop Test," Large Rotating Apparatus, Westinghouse Electric Corporation, LRA Memo No. 472, by Demerdash, N.A.

4. "Use of Turbine-Generator Excitation and Radial Flux Loss Computer Programs," Large Rotating Apparatus, Westinghouse Electric Corporation, LRA Memo No. 469, by Demerdash, N.A.

5. "Effective Permeability – A Method to Include Saturation in Nonlinear Eddy Current Problems," Large Rotating Apparatus Division, Westinghouse Electric Corporation, LRA Memo No. 470, by Demerdash, N.A.

6. "Behavior of the Space Shuttle Electrical Power System Load (Motors) Under Severe Environment in Space with Applications to Load Steady-State and Dynamic Characteristics," NASA Report No. JSC-09841, Control Systems Development Division, Johnson Space Center, Houston, Texas, August 6, 1975, by Demerdash, N.A.

7. "Characteristics of the Space Shuttle Motors Under Severe Environmental Conditions and System Disturbances," NASA Report No. JSC-09844, Power Distribution and Control Branch of the Control Systems Development Division, Johnson Space Center, Houston, Texas, August 5, 1975, by Demerdash, N.A.

8. "Analytical Modeling of the Dynamics of Brushless DC Motors for Aerospace Applications: A Conceptual Framework," NASA Report No. JSC-11552, Control Systems Development Division, Johnson Space Center, Houston, Texas, August 20, 1976, by Demerdash, N.A.

9. "Modeling of Three-Phase Induction Motors Supplied from Solid-State Inverters with Nonsinusoidal Output Wave Forms," NASA Report No. JSC-11553, Control Systems Development Division, Johnson Space Center, Houston, Texas, August 20, 1976, by Demerdash, N.A.

10. "Detailed Turbogenerator Modeling for Dynamic and Transient Studies - A Practical Approach," Final Report on Contract No. 208904-1 Submitted to MAPRC, EE Dept., Virginia Polytechnic Institute and State University, Oct. 1978, by Demerdash, N.A., Shah, M.R. and Grigsby, L.L.

11. "Simulation of Dynamics of Brushless DC Motors for Aerospace and Other Applications," Final Report on Contract No. NAS 9-15093 submitted to NASA-JSC, EE Dept., Virginia Polytechnic Institute and State University, Nov. 1978, by Demerdash, N.A. and Nehl, T.W.

12. "Finite-element Analysis of Nonlinear Electromagnetic Devices, Part (I)," November 1978, Submitted to the High Power Branch of the Aerospace Propulsion Laboratory, Wright Patterson Air Force Base, Dayton, Ohio, Contract No. SIP/78-17, by Demerdash, N.A., Nehl, T.W. and Fouad, F.A.

13. "Development of the Finite Element Formulation for the Three Dimensional Static Magnetic Field Problem, Stage No.1," Submitted to the Ford Motor Company, Contract No. NP-47-J-667579-9, Electrical and Electronics Division, January 1980, by Demerdash, N.A. and Nehl, T.W.

14. "Development of the Finite Element Formulation for the Three Dimensional Static Magnetic Field Problem, Stage No. 2," Submitted to the Ford Motor Company, Contract No. NP-47-J-667579-9, Electrical and Electronics Division, June 1980, by Demerdash, N.A., Nehl, T.W. and Fouad, F.A.

15. "Development of a Three Dimensional Finite Element Method for Solution of Magnetostatic Problems Using Magnetic Vector Potential," Final Report, Contract No. NP-47-J-667579-9, Submitted to the Electrical and Electronics Division, the Ford Motor Company, October 1980, by Demerdash, N.A., Nehl, T.W., Fouad, F.A. and Mohammed, O.A.

16. "Improved Transistor-Controlled and Commutated Brushless DC Motors for Electric Vehicle Propulsion," Final Report on NASA/DOE Contract No. DEN3-65 Submitted to NASA Lewis Research Center/DOE, Cleveland, Ohio, January 1983, by Demerdash, N.A., Miller, R.H., Nehl, T.W. and Nyamusa, T.A. (DOE/NASA/0065-83-1, NASA CR 168053).

17. "Grid Modules and Methods for Computer-Aided Analysis for Nonlinear Electromagnetic Fields in Electrical Devices by Finite Elements," Final Report on Subcontract SCEEE-SCRAP/81-5 of F33615-81-C-201 1, Submitted to the Southeastern Center for Electrical Engineering Education/High Power Branch of the Aerospace Propulsion Laboratory, WPAFB, U.S. Airforce, May 1983, by Demerdash, N.A. and Nehl, T.W.

18. "Analysis, Testing and Evaluation of Faulted and Unfaulted WYE, DELTA, and Open DELTA Connected Electromechanical Actuators," Final Report on contrast NAS9-16281, Submitted to NASA Johnson Space Center, Houston, Texas, July 1983, by Nehl, T.W., and Demerdash, N.A., Lewis Research Center, March, 1993, by Demerdash, N.A., and Wang, R..

19. "Dynamic Modeling of Brushless Excitation Systems for Large Turbine Generators," Final Report on Contract 61 14022E2B8, Submitted to Westinghouse Electric Corporation, Large Steam Turbine Generator Division, East Pittsburgh, PA 14112, July 1983, by Nehl, T.W. and Demerdash, N.A.

20. Dynamic Analysis of Permanent Magnet Generators with Different Rotor Configurations," Final Report on Contract: P.O. B-2L34 93-24M, Submitted to

Sundstrand Aviation Operations, Sundstrand Corporation, Rockford Illinois 61125, April 1988, by Demerdash, N.A. and Arkadan, A.A.

21. "Computer-Aided Modeling and Prediction of Performance of the Modified Lundell Class of Alternators in Space Station Solar Dynamic Power Systems," Final Report on Contract NAG3-818 - Submitted to NASA Lewis Research Center, March, 1993, by Demerdash, N.A., and Wang, R..

5.7 Patents and Patent Disclosures:

1. "Rotor for Dynamo-Electric Machines," US Patent, No. 3,697,791 by Lee A. Kilgore, and Nabeel A. Demerdash, Oct. 10, 1972.

2. "Method of Diagnosing a Broken Bar Fault in an Induction Motor", US Patent No. 7,081,760 by Behrooz Mirafzal and Nabeel A.O. Demerdash, July 25, 2006.

3. "An On-line Diagnostic Method for Electronic Switch Faults in Multilevel Neutral Point Clamped Converters," Provisional Application No. 62/255,083, by Jiangbiao He and Nabeel A.O. Demerdash, September 2015.

4. "A Novel Fault-Tolerant Topology for Multilevel NPC Converters with Improved Overload Capability," Provisional Application No. 62/255,075, by Jiangbiao He, Lixiang Wei, Nathan Weise, and Nabeel A.O. Demerdash, September 2015.

5.8 M.S. Thesis and Ph.D. Dissertation:

Masters of Science Thesis, "Effect of Complex Wave Forms on Losses in D.C. Motors," University of Pittsburgh, December 1967.

Doctor of Philosophy Dissertation, "Computerized Magnetic Field Model for Performance Calculation of Turbo-Generators with Asymmetrical and Symmetrical Rotors," University of Pittsburgh, August 1971.

6.0 TECHNICAL PRESENTATIONS CONDUCTED BY NABEEL A.O. DEMERDASH:

6.1 Presentations Conducted at International Conferences:

More than one hundred presentations conducted at the following conferences:

1) The 1970 IEEE - Industry and General Applications Society Meeting, Chicago, Illinois. (One presentation).

2) The 1972 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Three presentations).

3) The 1974 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Three presentations).

4) The 1974 International Magnetics Conference (INTERMAG-74), Toronto, Canada. (One presentation).

5) The 1975 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Two presentations).

6) The 1975 International Magnetics Conference (INTERMAG-75), London, England. (One presentation).

7) The 1976 IEEE - Power Engineering Society Summer Meeting, San Francisco, California. (One presentation).

8) The 1976 Joint International Magnetics - MMM Conference (INTERMAG-MMM-76), Pittsburgh, Pennsylvania. (Two presentations).

9) The 1977 International Magnetics Conference (INTERMAG-77), Las Angeles, California. (One presentation).

10) The 1978 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Two presentations).

11) The 1978 International Magnetics Conference (INTERMAG-78), Florence, Italy. (One presentation).

12) The 1979 IEEE - Power Electroncis Specialists Conference, San Diego, California. (One presentation).

13) The 1980 IEEE - Power Engineering Society Winter Meeting, New York, New York. (One presentation).

14) The 1980 International Magnetics Conference (INTERMAG-80), Boston, Massachusetts. (Two presentations).

15) The 1980 IEEE - Power Electroncis Specialists Conference, Atlanta, Georgia. (One presentation).

16) The 1980 International Electric Vehicle Exposition, St. Louis, Missouri. (One presentation).

17) The Collogue International sur Ia Commande et Ia Regulation Numerique Des Machines Elecriques (CONUMEL-80), Lyon, France. (One presentation).

18) The 1981 IEEE - Power Electroncis Specialists Conference, Atlanta, Georgia. (Three presentations).

19) The 1981 International Magnetics Conference (INTERMAG-81), Grenoble, France. (Four presentations).

20) The 1982 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Five presentations).

21) The 1982 International Magnetics Conference (INTERMAG-82), Montreal, Canada. (Two presentations).

22) The 1983 International Magnetics Conference (INTERMAG-83), Philadelphia, Pennsylvania. (Two presentations).

23) The 1984 IEEE - Power Engineering Society Winter Meeting, Dallas, Texas. (Two presentations).

24) The 1984 International Magnetics Conference (INTERMAG-84), Hamburgh, West Germany. (One presentation).

25) The 1985 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Six presentations).

26) The 1986 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Two presentations).

27) The 1987 IEEE - Power Engineering Society Winter Meeting, New Orleans, Louisiana. (One presentation).

28) The 1988 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Five presentations).

29) The 1989 IEEE - Power Engineering Society Winter Meeting, New York, New York. (One presentation).

30) The 1989 International Magnetics Conference (INTERMAG-89), Washington, D.C. (One presentation).

31) The 1990 International Magnetics Conference (INTERMAG-90), Brighton, U.K. (Two presentations).

32) The Fourth Biennial IEEE Conference on Electromagnetic Field Computation, CEFC '90, Toronto, Canada. (One presentation).

33) The 1991 IEEE - Power Engineering Society Winter Meeting, New York, New York. (Four presentations).

34) The 1991 Joint International Magnetics - MMM Conference (INTERMAG-MMM-91), Pittsburgh, Pennsylvania. (One presentation).

35) The 1992 IEEE-Power Engineering Society Winter Meeting, New York. (Two presentations)

36) The 1992 International Magnetics Conference, (INTERMAG '92), St. Louis, Missouri. (Three presentations)

37) The 1992 Fifth Biennial IEEE Conference on Electromagnetic Field Computation, CEFC '92, Clairmont, California. (Two presentations)

38) The 1993 IEEE-Power Engineering Society Winter Meeting, Columbus, Ohio. (Three presentations)

39) The 1993 IEEE-Power Engineering Society Winter Meeting, Columbus, Ohio. (Two presentations)

40) The 1993 IEEE-Power Engineering Society Summer Meeting, Vancouver, B.C., Canada. (Two presentations)

41) The 1994 IEEE - Power Engineering Society Summer Meeting, (Two presentations)

42) The 1995 IEEE - Power Engineering Society Winter Meeting, (One presentation)

43) The 1997 IEEE - Power Engineering Society Winter Meeting, (One presentation)

44) The 1997 IEEE-International Electric Machines and Drives Conference, Milwaukee, WI, (Four presentations)

45) The 1998 IEEE - Industry Application Annual Meeting, St. Louis, Missouri, (Two presentations).

46) The 1999 IEEE - International Electric Machines and Drives Conference, Seattle, WA, (Three presentations).

47) The 1999 IEEE - International Electric Machines and Drives Conference, Seattle, WA, (One of three keynote speakers at the plenary session of the conference).

48) The 2001 IEEE - Industry Applications Annual Meeting, Chicago, IL, (One presentation).

49) The 2002 IEEE - Industry Applications Annual Meeting, Pittsburgh, PA, (One presentation).

50) The 2003 IEEE - International Electric Machines and Drives Conference, Madison, WI, (Three presentations).

51) The 2009 IEEE - International Electric Machines and Drives Conference, Maimi, FL, (One presentation).

52) The 2015 IEEE - Energy Conversion Congress and Exposition, Montreal, Canada, (Two presentations).

6.2 Presentations Conducted at National and Regional Conferences:

More than seventy five presentations at various other IEEE sponsored Conferences on Industry Applications, Power Electronics, Electric Vehicles, and Region 3 IEEE Southeastcon., etc.

6.3 Technical Presentations Conducted at Various Corporate Industrial and Research Organizations, Government Agencies, and Universities:

Nabeel Demerdash has conducted more than 30 presentations and seminars on subjects such as Two and Three Dimensional Electromagnetic Saturation, as well as Practices and Experiences with Design and Fabrication of Electronically Controlled Electric Machinery System for Propulsion, Actuation and Industrial Drives, and Computer - Aided Design Optimization of Electronically Operated Permanent Magnet Brushless DC Machine Systems. Some of these presentations were conducted at the following organizations:

53) Department of Electrical Engineering, University of Pittsburgh, Fall 1971.

54) The Corporate Research and Development Center, the General Electric Company, Schenectady, New York, 1975.

55) The Corporate Research and Development Center the General Electric Company, Schenectady, New York, 1976.

56) The Johnson Space Center, Control Systems Development Division, NASA, Houston, Texas, 1975.

57) The Johnson Space Center, Control Systems Development Division, NASA, Houston, Texas, 1976.

58) A Joint Meeting of the IEEE-Power Engineering Society Chapter, and the Egyptian Engineering Society, Cairo, Egypt, 1977.

59) Department of Electrical Power Engineering and Electric Machines, Cairo University, Cairo, Egypt, 1977.

60) The High Power Branch, U.S. Airforce Aeropropulsion Laboratory, Wright-Patterson AFB, Dayton, Ohio, 1977.

61) Generator Systems Design Department, Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania, 1977, 1980 and 1981.

62) The Electrical and Electronics Engineering Department, the General Motors Research Laboratories, GM Tech-Center, Warren, Michigan, 1978 and 1992.

63) The NASA-Lewis Research Center, NASA, Cleveland, Ohio, 1978, 1979, 1980, 1982 and 1985.

64) The Department of Electrical Engineering, Ecole National Superieure d'Ingenieurs de Grenoble, Institute National Polytechnique de Grenoble, Grenoble, France, 1980.

65) The Sundstrand Corporations, Avionics Division, Rockford, Ill., 1980 and 1986.

66) The Department of Electrical Engineering, Ecole National Superieure d'Ingenieurs de Grenoble, Institute National Polytechnique de Grnoble, Grenoble, France, 1981.

67) The Electric Machines Institute ETH, EIDG Technische Hochschule (Technical University of Zurich), Zurich, Switzerland, 1981.

68) The IEEE-Magnetics Society Chapter, Pittsburgh, Pennsylvania, 1982.

69) Department of Electrical Power Engineering and Electric Machines, Cairo University, Cairo, Egypt, 1984.

70) The Electric Machines Institute ETH, EIDG Technische Hochschule (Technical University of Zurich), Zurich, Switzerland, 1985.

71) Department of Electrical Engineering, University of Ottawa, Ottawa, Canada, 1985.

72) Sundstrand Corporation, Sundstrand Aviation Operations, Rockford, Illinois, June 1986.

73) Michigan State University, Keynote Speaker, Session on "Hardware: Motor Design and Performance, Parameters of Importance, Finite Elements, New Materials," at the NSF Sponsored Workshop on Electrical Machines and Drives," East Lansing, Michigan, Oct. 11-12, 1988.

74) NASA Lewis Research Center, Space Station Program, Cleveland, Ohio, Nov. 15, 1988, and Sept. 12, 1989 (at Allied Signal Corporation, Los Angeles, CA., for NASA Lewis Research Center).

75) NASA Lewis Research Center, Space Station Power Management and Distribution Division, Cleveland, Ohio, Feb. 20, 1990.

76) Department of Electrical and Computer Engineering, Marquette University, Milwaukee, Wisconsin, Joint Meeting with the IEEE Section, Sept. 25, 1990.

77) Department of Electrical Engineering, Cairo University, Cairo, Egypt, Dec. 27, 28, 1994.

78) Allen-Bradley Rockwell Automation, Mequon, WI (Two Presentations During 1997).

79) MagnTek Corp. Drives Division, New Berlin, WI (One Presentation February 19, 1998) - Televised for Motor Group at MagnTek Rand D Center in St. Louis, MO.

7.0 AWARDS AND RECOGNITIONS:

1. Recipient of the 1999 IEEE Nikola Tesla Technical Field Award, with a Citation as Follows: "For pioneering contributions to electric machine and drive system design using coupled finite element and electrical network models," February 2, 1999.

2. Recipient of the 1999 IEEE Nikola Tesla Technical Field Award, with a Citation as Follows: "For pioneering contributions to electric machine and drive system design using coupled finite element and electrical network models," February 2, 1999.

3. Elected Fellow of the Institute of Electrical and Electronics Engineers by the Board of Directors of the Institute at its meeting of November 19-20, 1989, with the following citation: "For contributions to the application of finite element analysis to electrical machine design."

4. Achieved the status of Life-Fellow of the Institute of Electrical and Electronics Engineers, January 1, 2009.

5. Awarded "The 1993 IEEE-Power Engineering Society Prize Paper Award", for a paper on 3D-FE magnetic fields in electric machinery, See Paper No. 59 in Journal Publications List.

6. Awarded "The 1993 IEEE-Electric Machinery Committee (PES) Prize Paper Award", for a paper on 3D-FE magnetic fields in electric machinery, See Paper No. 59 in Journal Publications List.

7. Awarded "The 1994 IEEE-Power Engineering Society Working Group Award", for the development of two chapters in a Tutorial Text No. 92EH0362-4PWR, on "Adjustable Speed Drives", See item No. 5 in the section on Continuing Education - Course Development and Teaching.

8. Awarded "The 2012 IEEE-Power Engineering Society Prize Paper Award", for a paper on fault-tolerant operation of delta-connected motor-drive systems, see paper No. 111 in Journal Publications List.

9. Awarded "A 2012 IEEE-Industry Applications Society's Electric Machines Committee (EMC) Prize Paper Award," for a paper on computation of losses in permanent magnets in ac PM machines, see paper No. 114 in Journal Publications List.

10. Recipient of "the 2015 Lawrence G. Haggerty Faculty Award for Excellence in Research", Marquette University, April 13, 2015.

11. Recipient of the Eta Kappa Nu, Beta Omicron Chapter, Teaching Excellence "Teacher of the Year Award," February 7, 2003.

12. Recipient of the Sigma Xi Marquette University Chapter 1998 Scientific Achievement Award with a Citation as Follows: "For distinguished scientific research achievement in energy conversion devices," May 7, 1998.

13. Selected for listing starting 1992 in "Who's Who in Simulation".

14. Selected for biographical listing starting with the 47th Edition of Marquis' 1992-1993 "Who's Who in America".

15. Selected for biographical listing starting with the 1st. Edition of Marquis' "Who's Who in Science and Engineering", 1992.

16. Selected for biographical listing starting with the 18th. Edition of "American Men and Women of Science", January 1992.

17. Invited in 1990 to membership in "The Electromagnetics Academy", and simultaneously listed in "Who's Who in Electromagnetics".

18. Named in 1990 to the list of speakers of the "Distinguished Speaker Program" of the IEEE-Industrial Electronics Society (IES).

19. Named in 1987 to the list of the "Distinguished Lecturer Program" of the IEEE Power Engineering Society, see the IEEE Power Engineering Review, Vol. PER-7, No. 10, October 1987, pp. 12-13.

20. Awarded a NASA-ASEE Certificate of Recognition for "Successful Participation in the Summer Faculty Fellowship Program" held at NASA-Lewis Research Center, Summer of 1985.

21. Awarded Certificate of Recognition "for the Creative Development of Technology" by NASA, 1979, for Contributions to Modeling and Understanding of the Operation of Permanent Magnet Brushless DC Motor and Induction Motor Drives.

22. Awarded "Certificate of Teaching Excellence" during the Academic Year 1979/80 at Virginia Polytechnic Institute and State University.

23. Awarded and NSF International Travel Grant to present a paper on the Use of Magnetic Field Computerized Solution in Design Optimization of Turbo-generators at the International Conference on Magnetics (INTERMAG), held in London, England, April 14-17, 1975, at the Imperial College of Science and Technology.

24. Awarded NASA-ASEE Summer Faculty Research Fellowships at the Johnson Space Center, Houston, TX, for the summers of 1975 and 1976, and at the Lewis Research Center, Cleveland, Ohio, in the summer of 1985.

8.0 GRADUATE STUDENT SUPERVISION AND DIRECTION:

8.1 Ph.D. Students

Student	Degree and Date	Curriculum
1. V.K. Garg	Ph.D., completed August, 1975	EE (VPI &SU)

Dissertation Title: A Saturated Synchronous Machine Model for Dynamic Analysis and Control Purposes.

Remarks: See refereed papers No. 49, 50 and 52 in publication list, which were based on this research. Dr. Garg is now a Fellow of IEEE.

2. M.R. Shah Ph.D., completed May 1980 EE (VPI & SU)

Dissertation Title: A Practical Approach to Inclusion of Electromagnetic Field Nonlinearities in the Dynamic Modeling of Large Turbogenerators with Emphasis on the Interaction Between Machine Design and System Stability Aspects.

Remarks: See refereed journal paper No. 16 in the publication list, which was based on this research. Dr. Shah is now a Fellow of IEEE. He is also the 2012 Recipient of the IEEE Nikola Tesla Technical Field Award.

3. T.W. Nehl Ph.D., completed May, 1980 EE (VPI & SU)

Dissertation Title: A Discrete Time Model of a Power Conditioner Fed Permanent Magnet Braces DC Motor System for Aerospace and Electric Vehicle Applications for Design Purposes Using Finite Elements for Machine Parameter Determination.

Remarks: See refereed journal papers No. 15, 22, and 28 in publication list, which were based on this research. Dr. Nehl is now a Fellow of IEEE. He is also the 2007 Recipient of the IEEE Nikola Tesla Technical Field Award.

4. F.A. Fouad Ph.D., completed, May, 1981 EE (VPI & SU)

Dissertation Title: Finite Element Analysis for Design of Classical and Electronically Operated Machines.

Remarks: See refereed journal papers No. 20, 21 and 25 in publication list, which were based on this research.

5. O.A. Mohammed Ph.D., completed May, 1983 EE (VPI & SU)

Dissertation Title: Magnetic Vector Potential Based Formulation and Computation of Nonlinear Three Dimensional Magnetostatic Fields and Forces in Electrical Devices by Finite Elements.

Remarks: See refereed journal papers No. 18, 19, 23, 26, 34, 39, and 41 in publication list, which were based on this research. Dr. Mohammed is now a Fellow of IEEE.

6. T.A. Nyamusa Ph.D., completed February, 1985 EE (Clarkson U.)

Dissertation Title: Integrated Field-Network Analysis of Electronically Commuted Machine Systems.

Remarks: See refereed journal papers No. 40, 43, and 44 in publication list, which were based on this research.

7. A.A. Arkadan Ph.D., completed January, 1988 EE (Clarkson U.)

Dissertation Title: Computer-Aided Dynamic Performance Prediction of Permanent Magnet Generator Systems with Damping Circuits and Electronically Switched Loads.

Remarks: See refereed journal papers No. 49 and 50 in publication list, which were based on this research. Dr. Arkadan is now a Fellow of IEEE.

8. T.M. Hijazi Ph.D., completed June, 1988 EE (Clarkson U.)

Dissertation Title: Finite Element-Network Graph Theory Modeling Techniques for Design and Analysis of Permanent Magnet Electronically Commutated Brushless DC Motors Including Rotor Damping Effects.

Remarks: See refereed journal papers No. 46, 47 and 48 in publication list, which were based on this research.

9. Ren-hon Wang Ph.D., completed May, 1991 EE (Clarkson U.)

Dissertation Title: Combined Magnetic Vector-Scalar Potential Finite Element Computation of 3D Magnetic Field and Performance of Modified Lundell Alternators in Space Station Applications.

Remarks: See refereed journal papers No. 54, 55, 57, 59-61, which were based on this research. Dr. Wang is now a Fellow of IEEE.

10. Mohd Alhamadi Ph.D., completed September, 1992 EE (Clarkson U.)

Dissertation Title: Three Dimensional Finite Element Magnetic Field Computations and Performance Simulation of Braces DC Motor Drives with Skewed Permanent Magnet Mounts.

Remarks: See refereed journal papers No. 56, 58,71-73 which are based on this research.

11. M.K. Jamil Ph.D., completed December, 1993 EE (Clarkson U.)

Dissertation Title: Computer-Aided Study and Analysis of Effects of Choppers on the Performance of Permanent Magnet DC Machines.

Remarks: See refereed journal papers No. 52 and 53, which are based on this research.

12. Fang Deng Ph.D., completed April, 1994 EE (Clarkson U.)

Dissertation Title: A Time Stepping Coupled Finite Element-State Space Modeling Environment for Synchronous Machine Performance and Design Analysis in the ABC Frame of Reference.

Remarks: See refereed journal papers No. 77, 78, 80 and 81 in publication list, which were based on this research.

13. John Bangura Ph.D., completed August, 1999 EE (Marquette U.)

Dissertation Title: Diagnosis of Normal and Abnormal Operations of Induction Motors in ASDS by a Coupled Finite Element-Network Technique.

Remarks: See refereed journal papers No. 88 through 93, 95 and 96, which were based on this research.

14. Behrooz Mirafzal, Ph.D., completed August, 2005 EE (Marquette U.)

Dissertation Title: Incipient Fault Diagnosis in Squirrel Cage Induction Motors.

Remarks: See refereed journal papers No. 99 through 102 in Publications List, which were based on this research.

15. Chia-Chou Yeh, Ph.D., completed May, 2008 EE (Marquette U.)

Dissertation Title: Fault Tolerant Operations of Induction Motor-Drive Systems.

Remarks: See refereed journal papers No. 105 and 107 and refereed conference papers 66, 68 through 70 in Publications List, which were based on this research.

16. Ahmed Sayed-Ahmed, Ph.D., completed December, 2009 EE (Marquette U.)

Dissertation Title: Control of PWM AC Motor-Drive Systems Under Faulty Conditions.

Remarks: See the refereed journal papers No. 109 and 110.

17. Gennadi Y. Sizov, Ph.D., completed December, 2013 EE (Marquette U.)

Dissertation Title: Design Optimization of Interior Permanent Magnet Machines Based on Computationally-Efficient Finite Element Analysis.

Remarks: See the refereed journal papers No. 109 ,113 and 114.

18. Peng Zhang, Ph.D., completed December, 2013 EE (Marquette U.)

Dissertation Title: A Novel Design Optimization of a Fault-Tolerant AC Permanent Magnet Machine-Drive System.

Remarks: See the refereed Journal Papers No. 114, 115 and 116.

19. Jiangbiao He, Ph.D. completed December, 2015 EE (Marquette U.)

Dissertation Title: Health Condition Monitoring and Fault-Tolerant Operation of Adjustable Speed Drives.

Remarks: See the refereed Conference Papers.

20. Alireza Fatemi, Ph.D. completed December, 2016 EE (Marquette U.)

Dissertation Title: Design Optimization of Permanent Magnet Machines Over a Target Operating Cycle

Remarks: See the refereed journal papers No. 117, 118, and 119.

21. Andrew Strandt, Ph.D. candidate, in progress, EE (Marquette U.)

Research Area: High-efficiency control of electric machine-drive systems.

22. Yue Sun, Ph.D. student, in progress, EE (Marquette U.)

Research Area: Multi-objective design optimization of permanent magnet synchronous machines.

23. Hossein Nejadi Koti, Ph.D. student, in progress, EE (Marquette U.)

Research Area: Design optimization of AC motor drive systems.

24. Hao Chen, Ph.D. student, in progress, EE (two-year visit at Marquette U.)

Research Area: Design optimization of flux switching permanent magnet motor drive systems.

8.2 M.S. Students:

Student	Degree and Date	Curriculum
1. N.K. Lau	M.S., completed May, 1975	EE (VPI & SU)

Thesis Title: A New Approach to Flux Penetration and Losses in Nonlinear Solid Ferromagnetics with Applications to Power Apparatus.

Remarks: See refereed journal papers No. 8 and 10 in publication list, which were based on this research.

2. T.W. Nehl M.S., completed December, 1976 EE (VPI & SU)

Thesis Title: Comparison Between Finite Element and Finite Difference Methods Applied to Numerical Solutions of Electromagnetic Field Problems in Power Apparatus.

Remarks: See refereed journal papers No. 9 and 11 in publication list, which were based on this research. Dr. Nehl is now a Fellow of IEEE and a recipient of the IEEE Nikola Tesla Technical Field Award in 2007.

3. M.R. Shah M.S., completed May, 1977 EE (VPI & SU)

Thesis Title: Dynamic Models of Saturated Turbogenerators for Dynamic and Transient Power System Stability Studies.

Remarks: Dr. Shah is now a Fellow of IEEE and a recipient of the IEEE Nikola Tesla Technical Field Award in 2012.

4. Mike Jugan M.S., completed June, 1976 Systems Engineering (VPI & SU)

Report Title: Study of Processes of Uranium Enrichment.

5. A.K. Nagarkatti M.S., completed May 1980 EE (VPI & SU)

Thesis Title: Study of Performance and Certain Special Aspects of Electronically Commutated Braces DC Motor for Electric Vehicles.

Remarks: See refereed journal paper No. 27 in publication list, which was based on this research.

6. O.A. Mohammed M.S., completed Sept., 1980 EE (VPI & SU)

Thesis Title: Three Dimensional Finite Element Analysis of Elctromagnetic Fields in Electrical Devices.

Remarks: See refereed Journal Paper No. 18 and 19 in publication list, which were based on this research. Dr. Mohammed is now a Fellow of IEEE.

7. Magda Samaha M.S., completed May, 1981 EE (VPI & SU)

Thesis Title: Magnetic Vector Potential Finite Element Solution of Magnetic Fields in Electrical Machines Containing Permanent Magnets.

8. A.A. Arkadan M.S., completed August, 1981 EE (VPI & SU)

Thesis Title: Analysis of AC Brushless Exciters of Large Turbogenerators Using Finite Elements.

Remarks: See refereed Journal Paper No. 33 in publication list, which was partially based on this research. Dr. Arkadan is now a Fellow of IEEE.

9. M.M. El-Masry M.S., completed October, 1985 EE (Clarkson U.)

Thesis Title: Simulation of Steady State Conduction in Semiconductor Devices Using the Finite Element Method.

10. Vicky R. Johnson M.S., completed April, 1987 EE (Clarkson U.)

Thesis Title: Time-Domain Equivalent Circuit Model for Analysis of Inverter-Fed Induction Motors Compatible with Common Network Analysis Software Packages.

Remarks: See conference paper No. 42 which is partially based on this research.

11. Mohd Alhamadi M.S., completed May, 1988 EE (Clarkson U.)

Thesis Title: Modeling and Analysis of Inverter-Fed Induction Motors Using the Natural ABC Frame of Reference and Network Graph Techniques.

Remarks: See Journal Paper No. 56, which is partially based on this research.

12. Zemin Luo M.S., completed August, 1991 EE (Clarkson U.)

Thesis Title: Fields Surrounding Transmission Lines in Space Station Applications Using Finite and Ballooning Methods for Simulation of Infinite Boundaries.

Remarks: See refereed Journal Papers No. 62 and 63, which are partly based on this research.

13. Peter Baldasari M.S., completed December, 1991 EE (Clarkson U.)

Thesis Title: A Combined Finite Element-State Space Modeling Environment for Induction Motors in the ABC Frame of Reference.

Remarks: See refereed Journal Papers No. 64, 65 and 66, which are partially based on this research.

14. Fang Deng M.S., completed December, 1992 EE (Clarkson U.)

Thesis Title: A Coupled Finite Element-State Space Modeling Environment for Synchronous Machine Performance and Design Analysis in the ABC Frame of Reference.

15. Brian Boubar M.E., completed May, 1994 EE (Clarkson U.)

Project Area: On the Performance of Inverter Energized Three Phase Induction Motor Drives.

16. Frederick Isaac M.S., completed June, 1994 EE (Clarkson U.)

Thesis Title: Modeling and Comparison of Performance of Inverter and Sinusoidal No-Load Operation of Three Phase squirrel-Cage induction Motors Using a Time-Stepping Coupled Finite Element - State Space Method in the Natural ABC Frame of Reference.

17. Mark A. Bouton M.E., completed June, 1994 EE (Clarkson U.)

Project Area: On MOSFET Use in Inverters for Control of Three Phase Induction Motor Drives.

18. John F. Bangura M.S., completed May, 1996 EE (Marquette U.)

Thesis Title: A Time-Stepping Coupled Finite Element-State Space Modeling of Sinusoidal and Inverter-Fed Induction Motor Drives.

19. Robert G. Wagoner M.S., completed Dec., 1999 EE (Marquette U.)

Thesis Title: Calculation and Modeling of Transmission Line Characteristics and Their Effect on Line-to-Line Motor Voltage with PWM Adjustable Speed Drives.

20. ChiaChou Yeh M.S., completed May, 2003 EE (Marquette U.)

Thesis Title: Investigation of the Effects of Space Harmonics on Performance of AC and Brushless DC Machines Using Pspice.

21. Long Wu, M.S., completed August 2003, EE (Marquette U.)

Thesis Title: Three Stator/Rotor Winding ABC Representation Equivalence for Modeling and Simulation of Squirrel-Cage Induction Motors.

22. Mark Solveson, M.S., completed May 2004, EE (Marquette U.)

Thesis Title: Soft-started induction Motor Modeling and Heating Issues for Different Starting Profiles.

Remarks: See refereed Journal Paper No. 103, which is partially based on this research.

23. Ahmed Ibrahim Sesay, M.S., completed May 2005, EE (Marquette U.)

Thesis Title: Study of the Harmonic Effects Due to Transformer Magnetic Non-Linearities in Controlled Rectifiers Feeding Adjustable Speed DC Motors.

24. Gennadi Y. Sizov, M.S., completed December 2007, EE (Marquette U.)

Thesis Title: Analysis, Modeling and Diagnostics of Adjacent and Nonadjacent Broken Rotor Bars in Squirrel-Cage Induction Machines.

Remarks: See refereed Journal Paper No. 106 and refereed conference papers No. 72 and No. 73, which are based on this research.

25. Bojian Cao, M.S., completed December 2007, EE (Marquette U.)

Thesis Title: A Condition Monitoring Vector (CMV) Technique for Poly-Phase Electric Machine Fault Diagnostics.

26. Anushree Kadaba, M.S., completed May 2008, EE (Marquette U.)

Thesis Title: Design and Modeling of a Reversible 3-Phase to 6-Phase Induction Motor for Improved Survivability Under Faulty Conditions.

Remarks: See refereed conference paper 80, which is based on this research.

27. Matthew Hannan, M.S., completed May 2010, EE (Marquette U.)

Remarks: course option.

28. Shaohua Suo, M.S., completed May, 2011 EE (Marquette U.)

Thesis Title: Modeling and Validation of a Fault Mitigation Method in Induction Motor-Drive Systems Using Magnetic Equivalent Circuits.

Remarks: See refereed conference paper No. 78, which is based on this research.

29. Xin Jing, M.S., completed December, 2012 EE (Marquette U.)

Thesis Title: Modeling and Control of a Doubly Fed Induction Generator for Wind Turbine-Generator Systems.

Remarks: See refereed conference paper No. 85, which is based on this research.

30. Nantao Huang, M.S., completed May, 2013 EE (Marquette U.)

Thesis Title: Optimal Power Control of a 2-MW Wind Turbine Permanent Magnet Synchronous Generator System.

Remarks: See refereed conference paper No. 86, which is based on this research.

31. Alia Manarik, M.S., completed December, 2013 EE (Marquette U.)

Thesis Title: Comparison of Three Space Vector PWM Methods for a Three-Level Inverter with a Permanent Magnet Machine Load.

32. Andrew Strandt, M.S., completed December, 2013 EE (Marquette U.)

Thesis Title: Characterization of Stator Winding Shirt-Circuit Faults in Interior Permanent-Magnet Motor-Drive Systems.

33. Muyang Li, M.S., completed December, 2013 EE (Marquette U.)

Thesis Title: Control of Extended Constant Power Speed Range of Permanent-Magnet Synchronous Motors based on Z-Source Inverters.

34. Chad Somogyi, M.S., completed May, 2015 EE (Marquette U.)

Thesis Title: Common Mode Voltage Mitigation Strategies Using PWM in Neutral-Point-Clamped Multilevel Inverters.