Associate Professor
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Ramzy R. Obaid, Ph.D.

OBJECTIVE

To teach and conduct scientific research by serving on the faculty of an institution with strong focus on engineering education and academic excellence in undergraduate and graduate programs. Interest is mainly in the areas of energy engineering, power electronics, electric machines, and drives.

RESEARCH INTEREST

- **Energy Engineering**
  - Electric power generation, utilization of electrical energy, sustainability, DSM and conservation, and environmental and economical issues.
- **Renewable Energy**
  - Alternative fuels and green energy, wind, photovoltaics and solar cell applications, fuel cells, hydropower generation and others.
- **Electric Machines**
  - Modeling and simulations of various types of electric machines, taking into account unbalances and asymmetries in the models.
- **Condition Monitoring and Fault Detection**
  - Detection and early prediction of mechanical fault conditions in electric machines through current spectral analysis and vibration monitoring.
- **Electric and Hybrid Electric Vehicles**
  - Modeling and simulations of the electrical parts including the motor and the drive and enhancing the performance of these vehicles.

EDUCATION

Ph.D. in Electrical Engineering - *August 2003*
Georgia Institute of Technology, Atlanta, GA
Thesis Title: "Detection of Rotating Mechanical Asymmetries in Small Induction machines".

Master of Science in Industrial Engineering - *June 1999*
Georgia Institute of Technology, Atlanta, GA
Major: Statistical Process Control and Quality Assurance
Minor: Human Integrated Systems

Master of Science in Electrical Engineering - *September 1998*
Georgia Institute of Technology, Atlanta, GA
Major: Electric Power and Controls
Minor: Mathematics

Bachelor of Science in Electrical Engineering - *December 1992*
King Abdul Aziz University, Jeddah, Saudi Arabia

AWARDS AND HONORS

- Medal of Quality from the Saudi Electricity Company for the contribution at the 15th Quality Exhibition: Creativity Oasis, with an innovative photovoltaic project, February, 2012.
- WIPO Creativity Award from the World Intellectual Property Organization, in Geneva, Switzerland, May 2010.
- Academic Spotlight Award, ECE School, Georgia Tech, *April 2005.*
  The award is designated to recognize the instructor who has made a significant contribution to the teaching mission of ECE through exceptional job performance and/or service.
- The Savola company award for best B.Sc. project, *1992*.
- B.Sc. with Highest Honors *1992*.
- Dean's Honor list *1988-1992*.

PATENTS

- System and Method for Proactive Motor Wellness Diagnosis.
  # US7,075,327 B2. Date: 11/7/2006.
- System and Method for Proactive Motor Wellness Diagnosis Based on Potential Mechanical Faults. # US 7,117,125 B2. Date: 3/11/2006.

Inventors: Steven A. Dimino, Thomas G. Habetler, Ramzy R. Obaid, Slobodan Krstic, Michael P. Nowak, Yanzhen Liu

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CONTRIBUTIONS TO THE SCIENTIFIC COMMUNITY

- Invited keynote speaker at the Electric Vehicle Batteries and Charging Forum, Barcelona, Spain, March 2012.
- Invited keynote speaker at the IEEE Middle East Smart Grid Innovative Technologies Conference ISGT-ME, December, 2011.
- Invited as a visiting professor to teach Electric Energy courses at the University of Washington, Seattle, USA, 2011-2012.
- Published over 25 scientific papers and articles in international conferences, journals, and magazines

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TEACHING
AND RESEARCH
EXPERIENCE

King Abdulaziz University - Jeddah, Saudi Arabia: Associate Professor – *8/11- present.*

King Abdulaziz University - Jeddah, Saudi Arabia: Assistant Professor – *8/03- 8/11.*

- Conducting research in the following areas:
  - Energy generation in Saudi Arabia and renewable energy.
  - Wind Power Generation in Northern Jeddah.
  - Solar and Solar Thermal Power Generation.
  - Power systems and the new 400/230V ratings.
  - DSM and Energy Storage Systems.
  - Photovoltaic rooftop grid tied systems.
  - Automatic guidance for trolley haul trucks
  - Nanotechnology applications in photovoltaics
- Teaching courses in electric power:
  - EE250 : Basic Electrical Engineering for EE Majors
  - EE251 : Basic Electrical Engineering for non-EE Majors
  - EE332 : Numerical Methods for Electrical Engineering
  - EE442 : Power Electronics
  - EE445 : Utilization of Electrical Energy
  - EE490 : Special Topics – Electrical Energy
  - EE499 : Senior Design Projects
- Supervisor and Coordinator for undergraduate senior design projects:
  - ABET conformance check.
  - Coordinating and providing guidance for 120+ students per semester.
- Co-Investigator and member of the research team of the Scientific Chair of the Saudi Electricity Company at KAU, focusing on DSM issues in the power system of Saudi Arabia.
- Co-Investigator and member of the research team of the Solar UAV project, in collaboration between KAU and Tokai University, Japan, focusing on the Solar Power aspect of the aircraft.

Worcester College - Oxford, United Kingdom: Visiting Professor – *6/03 - 8/03.*

As part of the Oxford Study Abroad Program of Georgia Tech.

- Taught a course in electrical engineering.
- Taught a lab on electric circuits.

Georgia Institute of Technology-Atlanta, GA: Teaching Assistant – *1/02-6/03.*

- Teaching courses of electric machines, mechatronics, circuits, and electronics
  - ECE3710, ECE3301: Instructor with full course responsibility.
  - ECE3070, ECE4000: Instructor Assistant.
- Conducting research on electric machines and power electronics.
  - Detection of incipient defects and faults in rolling element bearings and prediction of remaining life before complete failure.

Georgia Institute of Technology - Atlanta, GA: Research Assistant – *12/96-12/01*

- DARPA Hybrid Electric Vehicles/Electric Vehicles project – development of the electrical system modules for the *PATHS* (Performance Assessment Toolbox for Hybrid Systems) software.
  - Developed electric power generation system & traction motor system modules incorporating permanent magnet & induction machines with various converter topologies.
  - Validated the developed electrical modules with measurements from an electric version of the Chevy S-10 pickup truck.
- Eaton Corporation project –induction machine diagnoses and mechanical fault detection.
  - Extensive testing of induction machines, including two-pole, four-pole, and six-pole machines, for asymmetries caused by rotating unbalances and shaft misalignments, and rolling element bearing faults.
  - Developed a simple approach for detecting mechanical conditions in induction machines.

King Abdul Aziz University - Jeddah, Saudi Arabia: Teaching Assistant – *3/93-6/94*

- EE251 – Basic electrical engineering course.
- EE341 – Electromechanical energy conversion and machines course.
  - Guest lectured during instructor's absence.
  - Prepared homework solutions.
  - Held office hours for homework/test questions.

OTHER WORK EXPERIENCE

Arab American Oil Company, ARAMCO – Ras Tannurah, Saudi Arabia:

Summer Intern – *1992*

- Worked at the communication department on testing phone line wiring.

Advanced Electronics Company, AEC - Riyadh, Saudi Arabia:

Summer Intern – *1990 and 1991*

- Attended a training course in soldering and obtained the Military-Standard 2000 certificate.
- Worked on the assembly of communication devices used in the M1-A1 military tanks.
- Worked on troubleshooting and repairing of PCB's used by the Saudi Telephone Company.

PROFESSIONAL MEMBERSHIPS

IEEE

- Member- *2003-present*
- Student member- *1994-2003*
- Power Electronics Society (pels)
- Power and Energy Society (PES)

Saudi Arabian Students Club Atlanta, GA

- President - *September 1996-August 1998*

PH.D. THESIS

Ramzy Obaid "Detection of Rotating Mechanical Asymmetries in Small Induction machines" *Ph.D. Dissertation*, Georgia Institute of Technology, Atlanta, GA, May 2003.

PUBLICATIONS

1. T. Alquthami and R. R. Obaid, "An adaptive dynamic model of the western power grid of Saudi Arabia," *Proceedings of the IEEE Innovative Smart Grid Technologies Conference - Middle East (ISGT Middle East),* December 2011, pp. 1-6.
2. R.R. Obaid, "Reducing Peak Electricity Demand through 300MW Wind Farm North of Jeddah, Saudi Arabia," *International Journal of Engineering & Technology,* April 2011, Vol. 11, No. 2, pp. 151-157.
3. R.R. Obaid, "Grid-Tied Solar Panel and Controller for Small Residential Applications," *International Journal of Thermal and Environmental Engineering*, March - June2011, Vol. 2, No. 1, pp. 103-107.
4. R.R. Obaid, "An Overview of Nanoscale Techniques for Photovoltaics and Solar Cell Fabrication," *Science and Engineering Journal of King Abdul Aziz University Press,* 2011. Volume 22, No. 2, pp. 109-127.
5. R.R. Obaid and R.H. Ahmed, "Automatic Guidance System for Trolley-Powered Mining Haul Trucks," Proceedings of the IEEE Industry Applications Society Annual Meeting, IAS 2009, pp. 1-6.
6. R.R. Obaid and A.H. Mufti, "Present State, Challenges, and Future of Power Generation in Saudi Arabia," Proceedings of the IEEE Energy 2030 Conference, 2008, pp. 1-6.
7. R.R. Obaid, "Applications of Nanotechnology in Photovoltaic Energy and Solar Cell Fabrication," International Conference on Nanotechnology, ICON008, 2008, p. 313, 10pp.

8. R.R. Obaid and T.G. Habetler, "Current-based Algorithm for Mechanical Fault Detection in Induction Motors with Arbitrary Load Conditions," *IEEE Industry Applications Conference, IAS*, October 2003, Volume 2, pp. 1347-1351.

9. R.R. Obaid, T.G. Habetler, and J.R. Stack "Stator Current Analysis for Bearing Damage Detection in Induction Motors", *IEEE International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives, SDEMPED*, August 2003, pp. 182-187.

10. R.R. Obaid and T.G. Habetler, "Effect of Load on Detecting Mechanical Faults in Small Induction Motors", *IEEE International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives, SDEMPED*, August 2003, pp.307-311.

11. R.R. Obaid, R.M. Tallam, and T.G. Habetler, "Detecting Mechanical Asymmetries in Inverter-Fed Induction Motors", *IEEE International Electric Machines and Drives Conference, IEMDC*, June 2003, Volume 3, pp. 1454-1458.

12. T.G. Habetler, R.G. Harley, R.M. Tallam, Sang-Bin Lee, R. Obaid, and J. Stack, "Complete Current-Based Induction Motor Condition Monitoring: Stator, Rotor, Bearings, and Load", *Technical Proceedings of the VIII IEEE International Power Electronics Congress, CIEP*, October 2002, pp.3 – 8.

13. R.R. Obaid and T.G. Habetler, "Comprehensive Testing of A Simple Technique for Detecting Mechanical Faults in Small Induction Motors", *IEEE International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives*, September 2001. pp. 219 – 224.

14. R.R. Obaid, T.G. Habetler and D. J. Gritter, "A simplified technique for detecting mechanical faults using stator current in small induction motors", *IEEE Industry Applications Conference, IAS 2000*, Volume: 1, pp. 479 – 483, October 2000.

15. C.M. Riley, T.G. Habetler and R.R. Obaid, "A Method for the Sensorless Determination of the Vibration Level in Inverter-Driven Induction Motors", *IEEE International Electric Machines and Drives Conference*, pp. 165-167, May 1999.