

Sang Bin Lee, Ph.D.



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I. Education

Georgia Institute of Technology, School of Electrical & Computer Engineering, Atlanta, GA Sept. '97 ~ Aug. '01
• Ph.D., Electrical Engineering (Academic advisor: Dr. Thomas G. Habetler)
Korea University, Department of Electrical Engineering, Seoul, Korea Mar. '90 ~ Dec. '91
• B.S. & M.S., Electrical Engineering Sept. '93 ~ Aug. '97

II. Employment History

Korea University, Department of Electrical Engineering, Seoul, Korea Sept. '04 ~ Present
• Full Professor
Austrian Institute of Technology (*aka Arsenal Research Laboratory*), Electric Drive Aug. '10 ~ July '11
Technologies, Vienna, Austria
• Visiting Research Scientist
GE Global Research Center, Electrical Machines and Drives Laboratory, Schenectady, NY July '01 ~ Sept. '04
• Senior Professional Research Staff

III. Academic Activities

Associate Editor, IEEE Transactions on Industry Applications, Electric May '07 ~ Present
Machines Committee, IEEE Industry Applications Society
Senior Member of the IEEE (Member since 1995) Dec. '07 ~ Present
Technical Program Chair, IEEE SDEMPED 2003 & 2013, 4th & 9th IEEE '03 & '13
International Symposium on Diagnostics for Electric Machines, Power Electronics, and Drives
Secretary, Awards Chair, and International Steering Committee Member, Sept. '05 ~ Present
Technical Committee on Diagnostics, IEEE Power Electronics Society
International Steering Committee Member, International Conference on Oct. '08 ~ Present
Electric Machines
Topic Chair, IEEE Energy Conversion Congress & Exposition (ECCE) '09, '10, '12, '13
• Monitoring & Diagnostics, Vibration & Noise
Prize Paper Review Committee, IEEE IAS Electric Machines Committee '07 & '12
Reviewer, IEEE IAS, PELS, IES, PES, DEIS Transactions Oct. '01 ~ Present

IV. Honors & Awards

First Prize Paper Award, Electric Machines Committee, IEEE Industry Applications Society Sept. '12
• "Detection and Classification of Rotor Demagnetization and Eccentricity Faults for PM Synchronous Motors," May/June 2012 issue of IEEE Trans. on Ind. Appl.
SDEMPED Prize Paper Award, Tech. Comm. on Diagnostics, IEEE Power Electronics Society Sept. '11
• "Detection of Broken Outer Cage Bars for Double Cage Induction Motors under the Startup Transient" Nov./Dec. 2012 issue of IEEE Trans. on Ind. Appl.
Second Prize Paper Award, Electric Machines Committee, IEEE Industry Applications Society Oct. '09
• "A Stator Core Quality Assessment Technique for Inverter-fed Induction Machines," Jan./Feb. 2010 issue of IEEE Trans. on Ind. Appl.
SDEMPED Prize Paper Award, Tech. Comm. on Diagnostics, IEEE Power Electronics Society Sept. '09

- “A New Strategy for Condition Monitoring of Adjustable Speed Induction Machine Drive Systems”, Feb. 2011 issue of IEEE Trans. on Pwr. Elec.
- First Prize Paper Award**, Electric Machines Committee, IEEE Industry Applications Society Oct. `06
- “An On-line Groundwall and Phase-to-Phase Insulation Quality Assessment Technique for AC Machine Stator Windings”, July/Aug. 2006 issue of IEEE Trans. on Ind. Appl.
- IEEE PES Prize Paper Award**, IEEE Power Engineering Society June `05
- “A New Method for Synchronous Generator Core Quality Evaluation”, Sept. 2004 issue of IEEE Trans. on Ener. Conv.
- Second Prize Paper Award**, Electric Machines Committee, IEEE Industry Applications Society Oct. `02
- “An On-Line Stator Winding Resistance Estimation Technique for Temperature Monitoring of Line-connected Induction Machines”, May/June 2003 issue of IEEE Trans. on Ind. Appl.
- Excellent Teaching Award (Upper 5%)**, Korea University, Seoul, Korea
- Power Electronics (1st Semester, 2005), Electric Machines (2nd Semester, 2006; 2012)
- Teaching Award (Upper 30%)**, Korea University, Seoul, Korea
- AC Electric Machines (`07, `10), Electric Machines (`07, `08, `09, `11)
- The 98'-99' Outstanding Graduate Teaching Assistant Award**, Department of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA May `99
- Management Award**, GE Global Research Center, Schenectady, NY Apr. `03
- For execution of generator inter-laminar core fault detector project

V. Lectures / Seminars / Invited Talks (2010~2013)

IEEE ECCE 2013 Tutorial (Scheduled) , Denver, CO USA	Sept. `13
Pohang Iron and Steel Company (POSCO) , Kwangyang, Korea	Feb. `13
GS Caltex Corporation , Yeosu Oil Refinery, Yeosu, Korea	Feb. `13
Korea Water Resources Corporation , Hanam/Dangjin, Korea	Jan./Feb. `13
Samsung Total Petrochemicals Company , Daesan, Korea	Dec. `12
IEEE ECCE 2012 Special Session – Monitoring and Diagnostics , Raleigh, NC USA	Sept. `12
Rockwell Automation , Mequon, WI USA	Aug. `12
SKF Condition Monitoring Center , Fort Collins, CO USA	Aug. `12, Sept. `11
Korea Electric Power Research Institute (KEPRI) Annual Training , Daejon, Korea	May `07 ~ Present
GE Global Research Center - Munich , Munich, Germany	July `11
University of Bologna , Bologna, Italy	Mar. `11
University of Modena and Reggio-Emilia , Reggio-Emilia, Italy	Mar. `11
Polytechnic University of Valencia , Valencia, Spain	Jan. `11
GE Global Research Center , Schenectady, New York USA	Sept. `10
Austrian Institute of Technology , Vienna, Austria	Aug. `10
Korea Heavy Electric Company (KOHECO) , Siheung, Korea	Apr. `10
Baker Instrument Company , Fort Collins, CO USA	Mar. `10

VI. Research Projects/Engineering Consulting as Prime Investigator

International Research Projects	Sept. `04 ~ Present
<ul style="list-style-type: none"> • GE Global Research Center, GE Power Systems, GE Energy, Austrian Institute of Technology, SKF Condition Monitoring Center, Baker Instrument Company 	
Domestic Research Projects	Sept. `04 ~ Present
<ul style="list-style-type: none"> • Samsung Electronics, Hansung Elec. Co., Korea Digital, POSCON Research Lab., Korea Electric Power Research Institute, Korea Electro-technology Research Institute, Korea Railroad Research Institute, National Research Foundation of Korea 	

VII. Publications

37 International Journal Publications in the IEEE Transactions	Oct. `00 ~ Present
47 International (IEEE) Conference Publications	
20 International Registered Patents	

Proposed Lectures

Testing and Diagnostics of Induction Machines in an Industrial Environment

Induction machines are undoubtedly the most dominant and important type of electrical apparatus used in industrial facilities in the power generation, petroleum & chemical, metals, pulp & paper, cement, and mining industries, etc. Continued operation of induction machines is critical for maintaining the productivity, efficiency, and reliability of the industrial facility. The goal of this lecture is to present an overview of electrical diagnostic techniques used in the field for off-line testing and on-line monitoring of medium~high voltage induction machines. The subjects covered in this lecture include 1) source problems (power quality issues, poor electrical contacts); 2) motor problems (rotor cage, airgap eccentricity, stator core, stator magnetic wedges, stator insulation, and bearings); and 3) load/coupling problems. A description of the problem, root causes and consequences of failure are given for each type of fault component, and the advantages and disadvantages of commercially available on-line and off-line technologies are presented. The target audience is practicing research and development engineers in the area of reliability, diagnostics, and prognostics for electrical machines in industrial environments.

Mitigation of False Fault Indications Produced by Motor Inspection Technology

Many off-line and on-line motor inspection methods for electric machines have been developed over the years to prevent forced outages due motor failures. False positive fault indications (alarm given for healthy motor) can result in unnecessary inspection costs, which is typically 10s of thousands of dollars for medium~high voltage motors. The impact of false negative fault indications (alarm not given for faulty motor) can be orders of magnitude higher if the motor and system fails unexpectedly due to the cost involved with loss of production. The goal of this lecture is to present the typical cases of false positive and negative fault indications in the field produced by commercial motor inspection methods such as steady state on-line spectrum analysis and off-line standstill testing. The cause of the false indications is analyzed, and guidelines for interpreting the test results for preventing the financial loss due to false alarms are given. Test methods (commercially available tests and tests under development) that can be used for screening out the false indications are presented to help minimize the impact of false alarms.

Condition Monitoring of Adjustable Speed Drive Systems

The performance and efficiency benefits of using PWM inverter-fed drives and the recent development in electric vehicle and energy businesses have resulted in a rapid increase in the use of adjustable speed drive (ASD) systems, and the reliability of the drive systems has become more important. However, there are many limitations to applying existing condition monitoring technology to ASD systems, due to current regulation, variable speed and load operation, etc, typically encountered in ASD systems. The goal of this lecture is to point out the problems and risks of applying existing technology to ASD systems, and to introduce potential solutions for condition monitoring and fault detection that are under research and development. The root causes, consequences, and mechanism of failures that can typically occur in permanent magnet (PM) synchronous and induction machines such as PM demagnetization, stator insulation degradation, airgap eccentricity, rotor cage failure are presented along with new diagnostics techniques. Failures that can occur in the inverter, such as dc link electrolytic capacitor, high-resistance contact, and IGBT-failures, are also covered in the lecture.