



Failure Analysis Associates®

Yanqing Du, Ph.D., P.E.
Managing Engineer

Professional Profile

Dr. Yanqing Du is a Managing Engineer in Exponent's Electrical Engineering and Computer Science practice. Dr. Du specializes in electrical engineering issues relating to electrical and electronic equipment failures such as power supplies, power transmission lines, transformers, and distribution switchgears, particularly in electrical insulation and moisture related failures. She has extensive experience in safety evaluations for lithium-ion batteries. She has performed routine safety evaluations for multiple vendors supplying mobile electronic devices and investigated incidents associated with failures of lithium-ion batteries. Dr. Du performs in-depth customized safety assessment for electrical appliances and devices to assist client with their product design. She also has experience with smart cards and RFID technology and ESD issues with payment cards.

Prior to joining Exponent, Dr. Du was a Senior Project Engineer for Conformity Assessment Services at Underwriters Laboratories (UL). She assessed product safety with respect to domestic and international regulatory compliance requirements on a wide range of products including home appliances, HVAC equipment, industrial control equipment, thermistors, thermostats, and electronic controllers. Both at Exponent and UL, Dr. Du conducted many compliance and safety-related audits of factories, production lines, and manufacturing facilities in U.S. and overseas.

Dr. Du was the co-developer of an interdigitated sensor system that can non-destructively measure the dielectric properties of insulating materials at the Massachusetts Institute of Technology.

Academic Credentials and Professional Honors

Ph.D., Electrical Engineering, Massachusetts Institute of Technology, 1999
M.S., Electrical Engineering, Massachusetts Institute of Technology, 1999
M.S., Electrical Engineering, Northwestern Polytechnical University, China, 1994
B.S., Electrical Engineering, Northwestern Polytechnical University, China, 1993

Sigma Xi; An Wang Graduate Fellowship, Massachusetts Institute of Technology;
Demonstration of Energy-Efficient Developments Scholarships, American Public Power Association, 1995, 1996, 1998; Graduate Student Award paper finalist in the Material Research Society Fall Meeting, 1997; Wang Tiwu Fellowship, 1994; Most outstanding university graduate in Shaanxi Province from Shaanxi Province Education Committee, China, 1994; Second Prize in the Physics Experiment category of the China Aeronautics and Astronautics

Ministry's Second Annual University Contest of Experimental Skills and Science Invention, 1992

License and Certifications

Licensed Professional Electrical Engineer, California, #E16502

Languages

Chinese

Patents

US Patent No. 7,936,274: Shield for Radio Frequency ID Tag or Contactless Smart Card, issued May 3, 2011 (Shkolnikov Y, Du Y, McGoran B).

Publications

Books

1001 Solved Engineering Fundamental Problems. Professional Publications, Inc., Belmont, CA, 2003 (contributing author).

Journals and Conference Papers

Du Y, Martin A, Gomez M. Voltage polarity effects on polymeric PTC current limiting devices. *Conformity* 2008; 13(5):34–39.

Mamishv AV, Sundara-Rajan K, Yang F, Du Y, Zahn M. Interdigital sensors and transducers. *IEEE Proceedings* 2004; 92(5):808–845.

Mamishv AV, Cantrell SR, Du Y, Lesieutre BC, Zahn M. Uncertainty in multiple penetration depth fringing electric field sensor measurements. *IEEE Transactions on Instrumentation and Measurements* 2002; 51(6):1192–1199, December.

Mamishv AV, Takahashi AR, Du Y, Lesieutre BC, Zahn M. Parameter estimation in dielectrometry measurements. *Journal of Electrostatics* 2002; 56:465–492.

Du Y, Zahn M, Altmirano N, Sarda M, Mamishv AV, Lesieutre BC. Moisture and temperature effects on dielectric spectrum of transformer pressboards. *Annual Report IEEE Conference on Electrical Insulation and Dielectric Phenomena*, pp. 878–881, 2002.

Mamishv AV, Takahashi AR, Du Y, Lesieutre BC, Zahn M. Assessment of performance of fringing electric field sensor arrays. *Annual Report Conference on IEEE Electrical Insulation and Dielectric Phenomena*, pp. 918–921, 2002.

Loud J, Nilsson S, Du Y. On the testing methods of simulating a cell internal short for lithium ion batteries. IEEE 17th Annual Battery Conferences on Applications and Advances, Long Beach, California, pp. 205–208, January 15–18, 2002.

Mamishv AV, Du Y, Bau JH, Lesieutre BC, Zahn M. Evaluation of diffusion-driven material property profiles using three-wavelength interdigital sensor. IEEE Transactions on Dielectrics and Electrical Insulation 2001; 8(5):785–798, October.

Du Y, Mamishv AV, Lesieutre BC, Zahn M, Kang SH. Moisture solubility for differently conditioned transformer oil. IEEE Transactions on Dielectrics and Electrical Insulation 2001; 8:805–811, October.

Lesieutre BC, Mamishv AV, Du Y, Keskiner E, Zahn M, Verghese GC. Forward and inverse parameter estimation of interdigital dielectrometry sensors. IEEE Transactions on Dielectrics and Electrical Insulation 2001; 8(4):577–588, August.

Markus Zahn, Yanqing Du, and Alexander Mamishv. Interdigital frequency-wavelength dielectrometry sensor design and parameter estimation algorithms for non-destructive materials evaluation. Plenary Lecture, 4th International Conference on Electric Charges in Non-Conductive Materials, Tours, France, July 2–6, 2001.

Du Y, Mamishv AV, Kang SH, Lesieutre BC, Zahn M. Measurements of moisture solubility for differently conditioned transformer oils. 13th International Conference on Dielectric Liquids, Nara, Japan, pp. 357–360, July 1999.

Mamishv AV, Du Y, Lin C, Lesieutre BC, Zahn M. One-sided measurement of material dielectric properties using liquid dielectric immersion technique. IEEE 13th International Conference of Dielectric Liquids, pp. 341–344, Nara, Japan, July 1999.

Du Y, Zahn M, Lesieutre BC, Mamishv AV, Lindgren S. Moisture equilibrium in transformer paper-oil systems. IEEE Electrical Insulation Magazine, Feature Article 1999; 15(1):11–20, January/February.

Mamishv AV, Du Y, Lesieutre BC, Zahn M. Development and applications of fringing electric field dielectrometry sensors and parameter estimation algorithms. J Electrostatics 1999; 46:109–123.

Du Y. Measurements and modeling of moisture diffusion processes in transformer insulation using interdigital dielectrometry sensors. Ph.D. thesis, Massachusetts Institute of Technology, June 1999.

Du Y. Moisture and temperature effects on the dielectric spectrum of transformer insulation materials. Master's thesis, Massachusetts Institute of Technology, February 1999.

Du Y, Mamishev AV, Lesieutre BC, Zahn M. Measurement of moisture diffusion as a function of temperature in transformer pressboard. 1998 IEEE Conference on Electrical Insulation and Dielectric Phenomena, pp. 341–344, Atlanta, GA, October 25–28, 1998.

Mamishev AV, Du Y, Lesieutre BC, Zahn M. Measurement of moisture spatial profiles in transformer pressboard. 1998 IEEE Conference on Electrical Insulation and Dielectric Phenomena, pp. 323–326, Atlanta, GA, October 25–28, 1998.

Mamishev AV, Du Y, Lesieutre BC, Zahn M. Development and application of multi-wavelength interdigital dielectrometry sensors and parameter estimation algorithms. Joint Symposium on Electrostatics, pp. 169–181, San Francisco, CA, June 1998.

Mamishev AV, Lin C, Lesieutre BC, Du Y, Zahn M. Improvement of algorithms for on-line interdigital dielectrometry measurement of material properties. IEEE International Symposium on Electrical Insulation, pp. 444–447, Washington, DC, June 1998.

Mamishev AV, Du Y, Lesieutre BC, Zahn M. Measurement of stratified distributions of dielectric properties and dependent physical parameters. Fall Meeting of the Materials Research Society, paper No. EE 4.11, Boston, MA, December 1997.

Du Y, Zahn M, Lesieutre BC. Dielectrometry measurements of effects of moisture and anti-static additive on transformer board. 1997 IEEE Conference on Electrical Insulation and Dielectric Phenomena, pp. 234–237, Minneapolis, MN, October 1997.

Washabaugh AP, Mamishev AV, Du Y, Zahn M. Dielectric measurements of semi-insulating liquids and solids. 12th International Conference on Conduction and Breakdown in Dielectric Liquids, pp. 381–384, Rome, Italy, July 1996.

Du Y, Zahn M, Lesieutre BC. Moisture dynamic measurements of transformer board using a three-wavelength dielectrometry sensor. 1996 IEEE International Symposium on Electrical Insulation, pp. 53–56, Montreal, Canada, June 1996.

Mamishev AV, Du Y, Zahn M. Measurement of dielectric property distributions using interdigital dielectrometry sensors. IEEE Conference on Electrical Insulation and Dielectric Phenomena, pp. 309–312, Virginia Beach, VA, October 1995.

Du Y. Research and design of advanced electrical control systems. Master's thesis, Northwestern Polytechnical University, P.R. China, 1994.

Du Y, Lao J, Ma J, Hu J. A design of an advanced electrical control system. 1st Asian Control Conference, Tokyo, Japan, July 1994.

Du Y, Lao J, Ma J, Hu J. Research on advanced electrical control systems. Proceedings, 6th National Conference on Control and Decision, pp.1199–1201, Xiamen, China, May 1994.

Du Y, Lao J. Fault diagnosis system for advanced electrical systems. Proceedings, Annual Conference of China Aerospace Association '94, Beijing, China, August 1994.

Du Y. Static analysis and numerical simulation of a variable-speed constant-frequency generator system. Bachelor's thesis, Northwestern Polytechnical University, P.R. China, 1992.

Presentations/Abstracts

Du Y, Loud J, Murray S, Vascilic S. Accelerated stress testing for home appliances. IEEE ASTR Workshop, San Francisco, CA, October 2006.

Hayes T, Horn Q, Wu M, Du Y. Advanced Li-ion and Li-ion polymer battery construction, reliability, manufacturing, and safety. 6th China (Shanghai) International Forum of Battery Technology & Market, Shanghai, China, November 23, 2006.

Hayes T, Horn Q, Wu M, Du Y. Failure analysis of Li-ion and Li-ion polymer battery. 5th China (Shanghai) International Forum of Battery Technology & Market, Shanghai, China, October, 2005.

Du Y, Mamishev AV, Kang SH, Altamirano N, Lesieutre BC, Zahn M. Monitoring of moisture dynamics in transformer insulation with dielectrometry sensors. EPRI Project Review Meeting, Consolidated Edison, New York, NY, December 10, 1998.

Mamishev AV, Bau JH, Tewari G, Du Y. Software implementation of general power equipment optimization methodology. Poster presentation at the Summer Meeting of the IEEE Power Engineering Society, San Diego, CA, July 1998.

Du Y, Mamishev AV, Lesieutre BC, Sarda M, Takahashi AR, Kang SH, Zahn M. Monitoring of moisture dynamics in transformer insulation with dielectrometry sensors. NSF/EPRI Project Review Meeting, ABB, Raleigh, NC, June 11, 1998.

Du Y, Mamishev AV, Lesieutre BC, Zahn M. Application of interdigital dielectrometry sensors for monitoring diffusion of moisture into solid dielectrics. 3rd International Conference on Electric Charge in Solid Insulators, Paper # 12, Tours, France, June 1998.

Mamishev AV, Du Y, Lesieutre BC, Zahn M. Interdigital dielectrometry sensors for measurements of spatial profiles of complex permittivity and related physical properties. 3rd International Conference on Electric Charge in Solid Insulators, Paper # 13, Tours, France, June 1998.

Mamishev AV, Du Y. Measurement of moisture distribution in power transformer pressboard. Poster presentation, Winter Meeting of the IEEE Power Engineering Society, February 1998.

Du Y, Lesieutre BC, Mamishev AV, Zahn M. Dielectrometry sensors to monitor moisture dynamics and other impurities in transformers. NSF/EPRI Project Review Meeting, MIT, Cambridge MA, December 3, 1997.

Mamishv AV, Du Y, Miller J, Castrillon J, Lesieutre B, Zahn M. Forward simulation and inverse parameter estimation of moisture diffusion in transformer pressboard. NSF/EPRI Project Review Meeting, MIT, Cambridge MA, December 3, 1997.

Du Y, Castrillon J, Lesieutre BC, Mamishv AV, Schlicker DE, Zahn M. Dielectrometry sensors to monitor moisture dynamics and other impurities in transformer. NSF/EPRI workshop, MIT, Cambridge, MA, March 26, 1997.

Castrillon J, Du Y, Lesieutre BC, Zahn M. Computer simulation of moisture dynamics experiments with oil impregnated pressboard. NSF/EPRI Project Review Meeting, MIT, Cambridge, MA, March 26, 1997.

Du Y, Lesieutre BC, Mamishv AV, Schlicker DE, Zahn M. Dielectrometry sensors to monitor moisture dynamics and other impurities in transformer. EPRI Project Review Meeting, EHV-Weidmann, St. Johnsbury, VT, October 31, 1996.

Du Y, Zahn M, Lesieutre BC. Dielectrometry measurements of effects of contaminants on transformer board. IEEE Conference on Electrical Insulation and Dielectric Phenomena, San Francisco, CA, October 20-23, 1996.

Du Y, Mamishv AV, Schlicker DE, Zahn M. Flow electrification research summary. EPRI Project Review Meeting, ABB, Raleigh, NC, May 21, 1996.

Du Y, Mamishv AV, Schlicker DE, Zahn M. The effects of moisture dynamics in oil-impregnated pressboard on flow electrification. EPRI Project Review Meeting, MIT, Cambridge, MA, December 7, 1995.

Schlicker DE, Du Y, Mamishv AV, Zahn M. Couette facility measurements. EPRI Project Review Meeting, MIT, Cambridge, MA, December 1995.

Du Y, Mamishv AV, Schlicker DE, Zahn M. Flow electrification research summary. EPRI Project Review Meeting, Ramapo, NY, August 10, 1995.

Zahn M, Du Y, Mamishv AV, Schlicker DE. Flow electrification research summary. EPRI Project Review Meeting, ABB, Raleigh, NC, April 13, 1995.

Technical Reports (not including working reports written at Exponent and UL)

Du Y, Lesieutre BC, Zahn M. Measurements and modeling of moisture dynamics in transformer insulation using interdigital dielectrometry sensors. Final Report, TR-113575, EPRI, Palo Alto, CA, January 2000.

Du Y. Dielectrometry measurements of moisture dynamics in pressboard in Couette flow facility. Final Report, DEED Scholarship, American Public Power Association, Washington, DC, May 1999.

Du Y. Dielectrometry measurements of solids and liquids in transformer environment using interdigital sensor. Final Report, DEED Scholarship, American Public Power Association, Washington, DC, July 1998.

Du Y. Dielectrometry measurements of moisture dynamics in transformer environment. Final Report, DEED Scholarship, American Public Power Association, Washington, DC, July 1996.

Prior Experience

Senior Project Engineer, Underwriters' Laboratories Inc., 2001–2005

Professional Affiliations

- Institute of Electrical and Electronic Engineers
- Dielectrics and Electrical Insulation Society
- Power Engineering Society