

# Dr. Sarath Kumara

Department of Electrical and Electronic Engineering, Faculty of Engineering,  
University of Peradeniya.

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## **Personal details**

Name in full : Jangu Ralalage Sarath Sisira Kumara  
Date of Birth : 14th October, 1979  
Gender : Male  
Marital Status : Married  
Nationality : Sri Lankan

## **Education**

- **Doctor of Philosophy in Engineering** Dec 2012  
Chalmers University of Technology, Gothenburg, Sweden  
*Electrical charges on polymeric insulator surface and their impact on flashover performance*
- **Technical Licentiate in Engineering** Nov 2009  
Chalmers University of Technology, Gothenburg, Sweden  
*Electrical charges on polymeric insulator surface and their impact on withstand performance*
- **Master of Philosophy in Engineering** Oct 2007  
University of Peradeniya, Peradeniya, Sri Lanka  
*Application study of fault current limiters in terms of protection coordination and interrupting duty on the switchgears*
- **B.Sc. Engineering (first class honours)** March 2004  
University of Peradeniya, Peradeniya, Sri Lanka  
*Electrical & Electronic Engineering*

## **Research Interests**

- High Voltage liquid and solid insulations
- Condition assessment of high voltage components
- Modeling and simulation of gas discharges and charge transport in solid
- Performance of high voltage composite insulators
- Effect of lightning on power system components
- Energy auditing and saving options
- Power system modeling and simulation

## **Publications**

### *Journals*

- Chistian submitted
- Thathsara submitted
- A.H.A.D. Abeysekara, J.R.S.S. Kumara, M.A.R.M. Fernando, M.P.B. Eakanayake, G.M.R.I. Godaliyadda and J.V. Wijayakulasooriya, "Remote Leakage Current Detector for Identification of Insulators Discharges", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 24, No.4, pp. 2449-2458, August 2017.
- W.M.S.C. Samarasinghe, J.R.S.S. Kumara, and M.A.R.M. Fernando, A.C.M. Ahamed and A.U.A.W. Gunawardena, "Aging Assessment of Transformer Pressboard Insulation by Micro-strip Ring Resonator at GHz Frequencies", IEEE Transactions on Dielectrics and Electrical Insulation, Vol.24, No.3, pp. 1923-1930, June 2017.

- Sarath Kumara, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Surface Potential Decay on LDPE with and without nano- fillers: Measurements and Modeling", IEEE Transactions on Dielectrics and Electrical Insulation, submitted, Vol.23, No. 6, pp. 3466-3475, Dec 2016.
- W.M.S.C. Samarasinghe, J.R.S.S. Kumara, and M.A.R.M. Fernando, A.C.M. Ahamed and A.U.A.W. Gunawardena, "Moisture Estimation of Transformer Pressboard by Micro-strip Ring Resonator at GHz Frequencies", IEEE Transactions on Dielectrics and Electrical Insulation, Vol.23, No.3, pp. 1409-1417, June 2016.
- Sarath Kumara, Bin Ma, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Surface charge decay on low-conductive polymer: effect of material treatment by corona discharges", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 19, No. 6, pp. 2189-2195, December 2012.
- Sarath Kumara, Shahid Alam, Imtiaz R. Hoque, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "DC flashover characteristics of a cylindrical insulator model in presence of surface charges", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 19, No. 3, pp. 1084-1090, June 2012.
- Sarath Kumara, Imtiaz R. Hoque, Shahid Alam, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Surface charges on cylindrical polymeric insulators", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 19, No. 3, pp. 1076-1083, June 2012.
- S. K. Abeygunawardane, J. R. S. Sisira Kumara, J. B. Ekanayake, A. Arulampalam, "A magnetic-core based fault current limiter for utility applications", Journal of National Science Foundation Sri Lanka, , Vol. 39 No. 3, pp.227-234, 2011.
- Sarath Kumara, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Surface charge decay on polymeric materials under different neutralization modes in air", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 18, No. 5, pp. 1779-1788, October 2011.
- Sarath Kumara, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Simulation of surface charge effect on impulse flashover characteristics of outdoor polymeric insulators", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 17, No. 6, pp. 1754-1763, December 2010.
- Sarath Kumara, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Charging of polymeric surfaces by positive impulse corona", IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 16, No. 3, pp. 726-733, June 2009.

#### *Local Journals*

- B.T. Hemamali, D.G.A.R. Lakmali, H.M.T.M. Kumari, M.A.R.M. Fernando and J.R.S.S. Kumara, "Lightning Effect on Copper and Optical Fiber (FTTN) Access Networks of Telecommunication System", IESL Engineer Journal, Vol. 49, No. 1, pp. 53-65, 2016.

#### *International Conferences*

- Aruni Bandara, Chalani Ratnayake, Dulanjalee Ambepitiya, Sarath Kumara, Manjula Fernando, Sirinivasan Venkatesh and D.K. Jayaratne, "Lightning Risk Analyses on Protected Sri Lankan Heritage Stupas", 13<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 18), Ropar, India, pp.322-327, Dec 2018.
- Aravinda
- Thathsara Herath J.R.S.S. Kumara, M.A.R.M Fernando, K.M.K.S Bandara, Ivan Sherana, "Comparison of Supervised Machine Learning Techniques for PD Classification in Generator Insulation", accepted to present in 12<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 17), Kandy, Sri Lanka, Dec 2017.
- G.A.T.N Aravinda, K.M.K.S Bandara, M.A.R.M Fernando, J.R.S.S. Kumara, G.A Jayantha, "Application of SFRA Techniques to Discriminate Short Circuit Faults of Transformer Winding", accepted to present in 12<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 17), Kandy, Sri Lanka, Dec 2017.
- J.R.S.S. Kumara, M.A.R.M Fernando and C.S. Kalpage, "Comparison of Coconut/Sesame/Castor Oils and Their Blends for Transformer Insulation", accepted to present in 12<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 17), Kandy, Sri Lanka, Dec 2017.
- R.M.D.U. Bandara, J.R.S.S. Kumara, M.A.R.M Fernando and C.S. Kalpage, "Possibility of Blending Sesame Oil with Field Aged Mineral Oil for Transformer Applications", accepted to present in 12<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 17), Kandy, Sri Lanka, Dec 2017.
- W.M.S.C. Samarasinghe, S. Manojithan, S. Subhankan, V. Sugues, M.A.R.M. Fernando & J.R.S.S. Kumara, "Condition Assessment of Field Aged Transformer Oils Up to 40 Years", IEEE International Conference on Industrial and Information Systems (ICIIS 15), pp. December 2015.

- Y. Zheng, S.Kumara, Y.Serdyuk, and S.M. Gubanski, "Modifications of dielectric properties of polyamides induced by long-term exposure to corona", Proceedings of International Conference on Properties and Applications of Dielectric Materials. paper AL0-4,(2015).
- N. W. N. J. Nanayakkara, K. P. Madubhashini, P. Y. C. D. Samarajeewa, M. A. R. M. Fernando, J. R. S. S. Kumara and C.S. Kalpage, "Aging studies of coconut oil impregnated pressboard samples", International Conference on Industrial and Information Systems (ICIIS 13), pp. 179-184, December 2013.
- A.T.N Aravinda, D.C Attaragama, I.T. Palawatte M.A.R.M Fernando, G.A Jayantha and J.R.S.S Kumara, "Condition Monitoring of Current Transformers Using Frequency Dielectric Spectroscopy", International Conference on Industrial and Information Systems (ICIIS 13), pp. 168-173, December 2013.
- W.M.L.B. Naranpanawe, M.A.R.M. Fernando, J.R.S.S. Kumara, E.M.S.N. Naramapanawa, C.S. Kalpage, "Performance Analysis of Natural Esters as Transformer Liquid Insulation – Coconut, Castor and Sesame oils", International Conference on Industrial and Information Systems (ICIIS 13), pp. 105-109, December 2013.
- Sarath Kumara, Yuesheng Zheng, Yuriy Serdyuk, Stanislaw Gubanski, Raimund Summer, Manjunath Ramesh, Reiner Haller, Peter Martinek, "Impulse testing of hybrid gas-solid polymer insulation systems", Proceedings of 18th International Symposium on High Voltage Engineering, pp. 509-514, Seoul, Korea, Aug. 25-30, 2013.
- Manjunath Ramesh, Shailendra Singh, Raimund Summer, Yuriy Serdyuk, Stanislaw Gubanski, Sarath Kumara, "Application of streamer criteria for calculations of flashover voltages of gaseous insulation with solid dielectric barrier", Proceedings of 18th International Symposium on High Voltage Engineering, pp. 1258-1263, Seoul, Korea, Aug. 25-30, 2013.
- Sarath Kumara, Yuesheng Zheng, Yuriy Serdyuk, Stanislaw Gubanski, Raimund Summer, Manjunath Ramesh, Reiner Haller, Peter Martinek, "Impulse testing of hybrid gas-solid polymer insulation systems", Proceedings of 18th International Symposium on High Voltage Engineering, pp. 509-514, Seoul, Korea, Aug. 25-30, 2013.
- Sarath Kumara, Yuriy V. Serdyuk and Stanislaw M. Gubanski, "Calculation of corona voltage-current characteristics in air", Proceeding of the 4th International Conference on Industrial and Information Systems (ICIIS 09), pp 489-492, Pedadeniya, Sri Lanka, December 2009.
- S. Kumara, Y. V. Serdyuk and S. M. Gubanski, "Measurement and Simulation of Positive Impulse Corona Current", 21<sup>st</sup> Nordic Insulation Symposium (NORDIS 09), 2009, Gothenburg, Sweden, pp. 117-120.
- S. Kumara, Y. V. Serdyuk and S. M. Gubanski, "Surface Charge Relaxation in Silicone Rubber and EPDM", IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP), 2009, Virginia Beach, USA, pp.181-184.
- J.R.S.S. Kumara, A. Atputharajah and J.B. Ekanayake, "Over Current Protection Coordination of Distribution Networks with Fault Current Limiters", IEEE PES General meeting 2006, Montreal, 2006.
- J.R.S.S. Kumara, A.M.T.K.Bandara, A. Atputharajah and J.B. Ekanayake, "Design and testing of a TCSC for Distribution network Applications", First International Conference on Industrial and Information Systems, Sri Lanka, pp.151-155, Aug 2006.
- J.R.S.S. Kumara, A. Atputharajah and J.B. Ekanayake, "Over Current Protection Coordination of Distribution Networks with Fault Current Limiters", International Seminar and Tutorial on Power Transmission Research Interests and Challenges, India, pp. 37, December 2005.

#### *Local Conferences*

- G.A.T.N Aravinda, K.M.K.S Bandara, M.A.R.M Fernando, J.R.S.S. Kumara, G.A Jayantha, "Postmortem Study of Decommissioned Power Transformer of Old Laxapana Power Station", IESL Central Region Annual Sessions, Kandy, Sri Lanka, 11 Sep 2016.
- W.M.S.C.. Samarasinghe, J.N.N. Shereen, J.R.S.S. Kumara, M.A.R.M. Fernando, "Power Transformer Pressboard Hotspot Simulation by Microwave Oven Heating", 110th IESL Annual Sessions, Colombo, Sri Lanka, 17-18 October 2016.
- D.K. Wijewardena, J.N.N. Shereen, K.M.D.E. Karunarathna, M.A.R.M. Fernando, J.R.S.S. Kumara and D.N. Uduwawala, "PD Signature Identification Using RF Antenna for Condition Monitoring in Power Transformers", Peradeniya University International Research Sessions (iPURSE) 2015, Paper Id. 313,2015.
- T.D.M.P.T. Bandara, G.K.W.K.N.B. Basnayaka, M.L. Silva, M.A.R.M. Fernando, J.R.S.S. Kumara and D.N. Uduwawala, "Voltage and Current Sensors for 33 kV EM Field Based Fault Indicators", Peradeniya University International Research Sessions (iPURSE) 2015, Paper Id. 359, 2015.

- T.M.I.S Tennakoon, J.R.S.S. Kumara, M.A.R.M. Fernando, “A Study of Marine Polluted HV Insulators in Puttlam Coastal Overhead Distribution Feeders”, IESL Central Region Annual Sessions, Kandy, Sri Lanka, 2015.
- N. W. N. J. Nanayakkara, W.M.L.B.Naranpanawe, M. A. R. M. Fernando, J.R. S. S. Kumara, C. S. Kalpage, K.R.B. Herath, “Condition assessment of thermally and corona aged coconut oil impregnated transformer solid insulation by FDS, tensile strength and visual observations”, 108th IESL Annual Sessions, Colombo, Sri Lanka, 2014.
- B.T. Hemamali, H.M.T.M. Kumari, D.G.A.R. Lakmali, M.A.R.M. Fernando, J.R.S.S. Kumara, “Investigation of lightning surges on public switched telephone network”, IESL Central Region Annual Sessions, Kandy, Sri Lanka, 2014.
- J.R.S.S. Kumara and D.T.T.M.T.Jayatissa, “Power Quality Improvement”, IEE younger members sessions 2003, Moratuwa, Sri Lanka, pp. 19, Sep 2003.
- C. J. Gajanayake, J.R.S.S.Kumara, M.K.M.Sana, A.Atputharajah and M.A.R.M. Fernando “Under Voltage Problem in Sri Lanka – A case study”, Peradeniya University Research Sessions, Sri Lanka, Vol. 9, pp. 75,Nov 2004.
- J.R.S.S. Kumara and D.T.T.M.T.Jayatissa, “Power Quality Improvement and Energy Saving for Industry”, Annual Publication 2004- Power, HV and Energy systems Group of University of Peradeniya ,Sri Lanka, pp. 44-45.
- J.R.S.S. Kumara, A. Atputharajah and J.B. Ekanayake, “Over Current Protection Coordination of Distribution Networks with Distributed Generation”, Annual Publication 2005- Power, HV and Energy systems Group of University of Peradeniya ,Sri Lanka, pp. 15-16.

### Thesis

- Sarath Kumara, “Electrical charges on insulator surface and their impact on flashover performance”, Doctoral thesis, Department of Materials and Manufacturing Technology, Chalmers University of Technology, Gothenburg, Sweden, 2012.
- Sarath Kumara, “Electrical charges on insulator surface and their impact on withstand performance”, Licentiate thesis, Department of Materials and Manufacturing Technology, Chalmers University of Technology, Gothenburg, Sweden, 2009.
- J.R.S.S. Kumara, “Application study of a fault current limiter in terms of protection and interrupting duty of switchgear”, M. Phil. Thesis, Oct. 2007.

### Experience

- **Post-doctoral researcher** - Chalmers University of Technology, Gothenburg, Sweden, since April 2019, project on Advanced electrical characterization of new insulation materials for HVDC cable applications.
- **Senior Lecturer** – University of Peradeniya, Sri Lanka, since 2013, Department of Electrical and Electronic Engineering.
- **Post-doctoral researcher** - Chalmers University of Technology, Gothenburg, Sweden, Nov 2014-Jan 2015, project on nano-dielectric for cable insulations.
- **Lecturer** – University of Peradeniya, Sri Lanka, 2007-2012, Department of Electrical and Electronic Engineering.
- **PhD candidate** – Chalmers University of Technology, Gothenburg, Sweden, 2010-2012, project funded by ABB AB, Sweden and Swedish Energy Agency.
- **Industrial PhD student** – High Voltage Valley, Ludvika, Sweden.2007-2009.
- **Research Assistant** – University of Peradeniya, Sri Lanka, 2005 – 2006, Project funded by AREVA T&D, UK.
- **Electrical Engineer** – State Development & Construction Corp., Sri Lanka, 2004-2005.
- **Temporary Instructor** - University of Peradeniya, Sri Lanka, 2007-2012, Department of Electrical and Electronic Engineering.

### Teaching

- **Undergraduate level**
  - GP108- Electricity – 1<sup>st</sup> Year
  - EE255 - Electric Power – 2<sup>nd</sup> Year
  - EE280- Introduction to Electrical Engineering – 2<sup>nd</sup> year non-electrical students

EE320- Electromagnetic Theory, Electrostatic section – 3<sup>rd</sup> year

EE358- Electrical Machines- 3<sup>rd</sup> Year

EE576- High Voltage Engineering- Final Year

- **Postgraduate level**

- EE661–Advanced Power System Analysis – MSc. Eng. in Elec. Power Applications

- EE662–Distribution systems Engineering – MSc. Eng. in Elec. Power Applications

- EE675- High Voltage Testing – MSc. Eng. in Elec. Power Applications

- EE676- Industrial Electrical Systems

- **Teaching to non-Engineering students**

- Energy Management – Msc in industrial Chemistry

- Electrical engineering Fundamentals – Allied Health Science undergraduates

- Electrical Principles – BEd in Engineering Technology

- Electrical Technology – School Teachers

- Electrical Installation and wirings- certificate course for Electricians

### **Postgraduate Supervision**

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- Thathsara Herath, Mphil, Condition Assessment of Generators using online Partial Discharge Measurements, Completed August 2018.
- G.A.T.N Aravinda, Msc Eng., Post Mortem Analysis of decommissioned power transformers, Completed in 2018.
- Tilanka Samarasinghe, Msc Eng Condition Monitoring and Assessment of Power Transformers using Sweep Frequency Response Analysis and Dissolved Gas Analysis, completed in 2018.
- Sameera Samarasinghe, Msc Eng, Thesis: Moisture Estimation of Transformer Pressboard by Microstrip Ring Resonator at GHz Frequencies, completed in 2016.
- Imalka Tennkoon, Msc Eng., Thesis: A Study on Marine Polluted HV Insulators in Puttlam Coastal Overhead Distribution Lines, completed in 2016.
- S. Prabakaran, A Hybrid Power System for Nainateevu Island, completed in 2016.

### **Consultancy work/ Workshop**

- Revision of Network Loss Targets for Sri Lankan Power system (Client: Public Utilities Commission of Sri Lanka)
- Electrical installation system designs, since 2013 (Recent designs: 1. Five story operation theater complex at Teldeniya Hospital, Sri Lanka, 2. Six Story Commercial Building at Mulgampola, Kandy, 3. Midlands PS Tea Factory, Rattota, Sri Lanka).
- High voltage testing at Chalmers University of Technology, Sweden and University of Peradeniya, since 2007.
- Protection system design of Ceylon Oxygen Limited 33 kV in-feed and 11 kV distribution system.
- Energy audit, lightning protection system designs, earthing system designs.
- Design of impulse and ac test facilities for Noratel Pvt Ltd, Katunayake, Sri Lanka, May 2013.
- Resource person for Teacher training programs.

### **Research Grants**

- University Research Grants No. RG/ 2014/19/E, Rs. 2,570,000/=, 2014-2015  
Topic: Suitability of Alternative Oils for Power Transformers - Aging and its influence.
- National Research Council Grant No. 16/022, Rs. 3,960,000/=, 2016-2018,

Topic: Condition Assessment of Generators using online Partial Discharge Measurements

### ***Awards***

- Ceylon Electricity Board Gold medal and Prize for Best performance in Electrical and Electronic Engineering, 2004.
- Prof. E.O.E. Pereira award for best performance in Engineering, Final part II, 2003.
- University Studentship for two best performances in Engineering, 2004.
- R. H. Paul prize for Electric Power and Machines, University of Peradeniya, 2004.
- W. M. G. Fernando prize for Electronic Communications, University of Peradeniya, 2004.

### ***Memberships***

- Senior Member of IEEE.
- Associate member of Institute of Engineer Sri Lanka (AIESL).

### ***Professional Activities***

- Director, Electronic Workshop, University of Peradeniya, Sri Lanka.
- Management Committee member, National Engineering Design Centre, University of Peradeniya.
- Course Director, Kelani Saviya Pogram, University of Peradeniya and Kelani Cables PLC.
- Postgraduate Coordinator/Department of Electrical and Electronic Engineering, Faculty of Engineering, Peradeniya, Oct 2013-Dec 2016.
- Chair of IEEE Sri Lanka Central Region Sub Section 2015-2017.
- Treasure of IEEE Sri Lanka Section 2016-2017.
- Treasure of IEEE Power Engineering Society Sri Lanka Chapter 2016-2017.
- Student Activities Chair IEEE Sri Lanka Section 2015-2016.
- Secretary of IEEE Sri Lanka Section 2014-2015.
- Financial chair of 12<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2015), University of Peradeniya, Sri Lanka, December 2017.
- Publication chair of 10<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2015), University of Peradeniya, Sri Lanka, December 2015.
- Session co-chair of 10<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2015), University of Peradeniya, Sri Lanka, December 2015.
- Reviewer of 10<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2015), University of Peradeniya, Sri Lanka, December 2015.
- Reviewer of Peradeniya University International Research Sessions (iPURSE), University of Peradeniya, Sri Lanka, 2015.
- Session co-chair of Peradeniya University International Research Sessions (iPURSE), University of Peradeniya, Sri Lanka, 2015.
- Reviewer, IEEE Transaction of Dielectrics and Electrical Insulations, Since 2014.
- Conference secretary of 8<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2013), University of Peradeniya, Sri Lanka, December 2013.
- TPC Track chair of 8<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2013), University of Peradeniya, Sri Lanka, December 2013.
- Reviewer of 8<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2013), University of Peradeniya, Sri Lanka, December 2013.

- Participant of CIGRE meeting at Paris France, 2012.
- Guest participant for Cigre Working Group meetings .
- Presenter, Nord-Is conference, Tampere, Finland, June 2011.
- Presenter, Nord-Is conference, Gothenburg, Sweden, June 2009.
- Presenter, CEIDP conference, Virginia Beach USA, Oct 2009.
- Participant, study visit to world leading manufacturing Plants:
  - ABB High Voltage Cable Factory, Karlskrona, Sweden, 2009.
  - Schneider Electric Medium Voltage, Regensburg, Germany.
  - MR Tap changers, Regensburg Sweden.
  - Schneider Electric Medium Voltage, Lion, France.
  - ABB Power Transformers, Surge Arrestors, Ludvika, Sweden, 2009.
  - ABB traction transformers, Geneva, Switzerland.
  - ABB high power Laboratory, Ludvika Sweden.
  - SRTI laboratory, Ludvika Sweden.

**Sarath Kumara**

**6<sup>th</sup> Aug 2019**