

MADAN KUMAR LAKSHMANAN

SENIOR SCIENTIST (CSIR-CEERI)

Council of Scientific and Industrial Research (CSIR)
Central Electronics Engineering Research Institute (CEERI)
Chennai, India

ASSISTANT PROFESSOR (AcSIR)

Academy of Scientific and Innovative Research (AcSIR)

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SUMMARY

Area of specialization: Cyber Physical Systems, Signal Processing, Computer Vision, Deep learning, Multivariate data Analysis; Vibrational Spectroscopy; Multi-rate Communication Systems

Research Interests: Internet of Things; Signal Processing for Biomedical engineering; Data analysis, Statistical learning & Machine learning towards processing of biomedical signals; Chemometrics for analysis of consumer products, organic materials and polymers; Development of algorithms for multivariate analysis and their implementation on embedded hardware

Experience: Over 19 years of experience conducting research in India (8.5 years) & abroad (5 years) and working for the Industry (3.5 years)

CURRENT EMPLOYMENT

Senior Scientist

Central Electronics Engineering Research Institute (CSIR-CEERI), CSIR Madras Complex, Chennai. (December 2015 - Present)

Internet of Things, Signal Processing for Physiological signals, Design & development of opto-electronic hardware, computational systems & machine learning based chemometric software for the Near-Infrared Reflectance Spectroscopy (NIRS) based material component study of selective food ingredients such as Pepper, Honey, Food additives, Edible Oil and Coconut

Assistant Professor

Academy of Scientific and Innovative Research (AcSIR). (April 2012 - Present)

Teach the courses *Mathematics for Engineers* and *Writing a Project Proposal* for the M.Tech/PhD program 'Renewable Energy'

PAST EXPERIENCE

Scientist

Central Electronics Engineering Research Institute (CEERI), CSIR Madras Complex, Chennai. (April 2012 - December 2015)

Research on the application of Near-infrared spectroscopy and multivariate analysis for the material component study of bio-substances, agricultural produce and plastic materials

Researcher

International Research Center for Telecommunications and Radar, Delft University of Technology, The Netherlands. (Sep 2006 - July 2011)

Research on Wideband Communication using wavelet packets

Project Officer

Media Lab Asia, Telecommunications And Computer Networks (TeNeT) Group, Indian Institute of Technology, Madras (IIT-Madras), India. (Dec 2003- August 2004)
Development of Wireless backhaul network for rural connectivity

Systems Engineer

Polaris Software Labs Limited, Chennai, India. (July 2000 – Nov 2003)
Design & development of software for telecommunication applications

EDUCATION

Ph.D. in Electrical Engineering

International Research Center for Telecommunications and Radar, Delft University of Technology, The Netherlands. (July 2007- November 2011)

- Dissertation Title: Reconfigurable and Adaptive Wireless Communication Systems based On Wavelets Packet Modulators
- Research on wavelet based signal processing algorithms and transmission techniques for wireless communication

M.Sc. in Telecommunications

Delft University of Technology, The Netherlands. (Sep 2004 – August 2006)

- Graduated with Honors (CUM LAUDE). CGPA: 9/10.
- Thesis Title: UWB Interference Mitigation Using Wavelets and Multi-carriers Based Templates
- Research on Interference mitigation techniques using wavelet transforms for wireless communication

B.E. in Electronics and Communications Engineering

University of Madras, Chennai, India. (August 1996 – May 2000)

- Graduated with DISTINCTION. Over all Marks: 82.48 %
- Thesis Title: The Personnel Identification System
- Developed an automated security system based on micro-controllers & sensors

AWARDS AND HONORS

Listed in Chronological order

S. No.	Name	Year	Donor organization	Details
1	ON THE SPOT OF EXCELLENCE AWARD	2001	Polaris Software Lab Limited, India	Employee of the month
2	ROYAL DUTCH/SHELL CHEVNING SCHOLARSHIP	2004	Shell Corporation, Europe	Scholarship granted by Shell Corporation, Europe, to conduct Masters study Program at the Delft University of Technology, The Netherlands
3	CUM LAUDE	2006	Delft University of Technology, The Netherlands	For graduating Masters study with distinction
4	BEST STUDENT PAPER AWARD	2007	The National Institute of Information and Communications Technology, The	Awarded the BEST STUDENT PAPER at the 10th International Symposium on Wireless Personal Multimedia

			YRP R&D Promotion Committee & The CTIF Global Capsule, Japan	Communications, December 2007, Jaipur, India. The jury consisted of eminent teachers and academics from the Indian Institute of Technology (IIT)-Bombay and IIT-Madras.
5	STUDENT TRAVEL GRANT- European Microwave Week 2009, Rome, Italy	2009	The European Microwave Association (EuMA)	Awarded STUDENT TRAVEL GRANT to attend the European Microwave Week 2009 and present paper. The grants are given to technical submissions ranked high in peer reviews.
6	NETELCOM AWARD 2010	2010	Dutch Research Delta, The Netherlands	The award is presented to the most innovative scientific contribution of a PhD student, related to telecommunications, in The Netherlands. The 2010 edition jury was chaired by Mr. Ben Verwaayen, CEO of Alcatel-Lucent/BELL Laboratories. A cash award of Euro 5000 was granted.
7	STUDENT TRAVEL GRANT- CoGART 2010, Rome, Italy	2010	Cognitive Radio and Advanced Spectrum Management, Europe	Awarded STUDENT TRAVEL GRANTS to attend The 3rd International Workshop on Cognitive Radio and Advanced Spectrum and present paper. The grants are given to technical submissions ranked high in peer reviews.
8	PROMOOD PRIZE 2010	2010	Promood, representative body of PhD candidates at the Delft University of Technology	Best student essay
9	ERASMUS MUNDUS - MOBILITY FOR LIFE SCHOLARSHIP	2010	European Union	To pursue Post-Doctoral studies
10	STUDENT TRAVEL GRANT – IEEE Dyspan 2011, Aachen, Germany	2011	Institute of Electrical and Electronics Engineers (IEEE)	Awarded STUDENT TRAVEL GRANTS to attend IEEE International

				Symposium on Dynamic Spectrum Access Networks and present paper. The grants are given to technical submissions ranked high in peer reviews.
11	3 RD NATIONAL AWARDS FOR TECHNOLOGY INNOVATION	2012	The Ministry of Chemicals and Fertilizers, Government of India	Member of the CSIR-CEERI team which won the Runner Up for the 3 rd NATIONAL AWARDS FOR TECHNOLOGY INNOVATION 2012-13 under the category of Innovation in Polymer Waste Management and Recycling Technology.
12	BEST PAPER AWARD - IEEE GHTC	2013	Institute of Electrical and Electronics Engineers (IEEE)	Selected as one of the two best papers of IEEE Global Humanitarian Technology Conference-South Asian Satellite (IEEE GHTC-SAS) 2013 held at Thiruvananthapuram, Kerala. The paper was nominated to be presented as an INVITED PAPER to the main event, IEEE GHTC conference, held at Silicon Valley, USA. A travel assistance covering the air travel expenses to travel to the conference venue was offered.
13	FELLOWSHIP UNDER THE INTERNATIONAL TRAVEL SUPPORT SCHEME	2013	Science and Engineering Research Board (SERB), Department of Science and Technology (DST)	Received a fellowship under the International Travel Support Scheme of the, Government of India, to present papers at the 16th International Conference on Near-Infrared Spectroscopy held at Montpellier, France during 2-7

				June 2013. The fellowship covered the expenses incurred towards Air travel and registration.
14	TRAVEL FELLOWSHIP PROGRAMME	2013	Centre for International Co-operation in Science (CICS), Government of India	Recipient of the Travel Fellowship Programme to present an Invited Paper at the IEEE Global Humanitarian Technology Conference (IEEE-GHTC) held at Silicon Valley, San Jose, USA during 20-23 October 2013.
15	BEST POSTER AWARD	2018	Indian Institute of Food Processing Technology (IIFPT), Ministry of Food Processing Industries	Received BEST POSTER AWARD at the International Conference on Recent Advances in Food Processing Technology (ICRAFPT 18)
16	BEST ALUMNI	2020	Recipient of the Crescent Alumni Association Award 2019-20 for the Best Alumni under the category Academics.	

OTHER COMMENDATIONS

- Graduated Masters Program with HONORS (CUM LAUDE).
- Graduated Bachelors Program with DISTINCTION.
- Published more than 45 articles in peer-reviewed international journals & conferences.
- Doctoral research funded by the Dutch Research Delta, a consortium of Dutch research organizations and telecommunication companies.
- Brain bench Certified MASTER IN C++ Professional.
- Ranked 2nd in a class of 79 in the final year of under graduate study.

TECHNOLOGIES TRANSFERRED/INDUSTRY WORK

Sl. No	Technology	Collaborating organization/Industry
1.	Plastic Waste Sorting system for five type of plastics	M/s. Spectrum Industries Private Limited, Mangalore
2.	Solar tree application for estimation of energy and power	Central Electronics Limited, New Delhi
3.	Multi modal fatigue detection	Samsung India Electronics Pvt. Ltd

4.	Non-intrusive Healthcare Analytics	Samsung India Electronics Pvt. Ltd
5.	Chronic Disease Detection	Samsung India Electronics Pvt. Ltd
6.	Development of Software algorithm using IR and Fluorescence spectroscopy for crude oil and other downstream fluids in refinery property measurement	M/s. Lambda Innovations Pvt. Ltd.
7.	Installation & evaluation trials of an On-line moisture transmitter system for crushed Copra	M/s. Marico Pvt. Ltd.
8.	Reconfigurable and Adaptive Wireless Communication Systems	Dutch research Delta, The Netherlands
9	Extraction, Transformation and Loading tool for Retail business	Mega Ser Agresso, Dortmund, Germany
10	Data science automation software with banking services	Nippon Electric Corporation (NEC), Japan

PHD GUIDANCE

- Guided the AcSIR the Phd student, Sumon Dey, towards her Doctoral thesis work on the topic *Design and Optimization of Solar Tree for Smart Cities*. **Ms Sumon Dey successfully defended on 20-October 2020**. Her work has been recommended for Best PhD thesis award.
- Co-guided the AcSIR integrated M.Tech/Phd student Steffi NJ E towards her Doctoral thesis work entitled *Online Health Monitoring and Electrochemical Diagnostic study of Failures in Polymer Electrolyte Membrane Fuel Cells*. **Ms Steffi successfully defended her PhD dissertation on 18 December 2019**.
- Guiding the AcSIR integrated M.Tech/PhD student, Surendra, towards his Doctoral thesis work entitled *Engineering of HCG for Spectrum Tailoring Applications*.
- Co-guiding the AcSIR integrated M.Tech/Phd student, Ameen E, towards his Doctoral thesis work entitled *Smart Power Windows using High Contrast Gratings*.

OTHER PROFESSIONAL ACTIVITIES

- Nominated as an Expert for the Doctoral Advisory Committee (DAC) of Universities such as AcSIR (5 candidates); Satyabhama University (3 candidates); SRM University (3 Candidates).
- Affiliated to IEEE (2006-2015), Communications Society (2006-2011), European Microwave Association (2006-2011).
- Reviewed Journal articles for: IEEE Journal on Selected Areas in Communication, IEEE Transactions on Vehicular Technology, IEEE Communications Magazine, IEEE Transactions on Wireless Communication, IEEE Communication Letters, IEEE Transactions on Communications, IET Electronic Letters.
- Reviewed Conferences articles for: IEEE Globecom {2007, 2008}, IEEE VTC {2008,2009}, Crowncom {2010}, IEEE CCNC {2008, 2009, 2010}, IEEE Dyspan {2009}, EuWIT {2006, 2007, 2008, 2009, 2010}, IEEE PIMRC {2008, 2009, 2010}, IEEE SCVT-Benelux {2007}.
- Tutor junior grade students on basic Math and Science.
- Review technical papers for various journals and conferences.
- Assist graduate students towards their Doctoral, Masters and Bachelors thesis work.
- Prepare tutorial material on subjects of mass interest.
- Deliver invited talks and lectures at various scientific and technical forums

EXTRA CURRICULAR ACTIVITIES

- Rendered Violin concert at the national station 'All India Radio'.
- Played Cricket at junior level for school and provincial teams.