

Xavier Fernando

Professor, P. Eng. and Senior Member, IEEE

<https://www.linkedin.com/in/xavierfernando/>

Objective

With 30 years of remarkable international academic experience in engineering, enhanced with leadership roles in the University and IEEE, I am seeking to expand my career in the academia with strong research leadership roles.

Experience

Sept. 2010 – Present	<i>Director, TMU Intelligent Communication and Computing Lab, Toronto Metropolitan (formerly Ryerson) University, Toronto, Canada</i>
Sept. 2012 – Present	<i>Professor, Dept. of Electrical and Computer Eng., Toronto Metropolitan (formerly Ryerson) University, Toronto, Canada</i>
Sept. 2025 – Dec. 2025	<i>Fulbright Canada Research Chair in Computers, Science and Engineering</i>
Sept 2009 – Aug. 2011	<i>Member of Board of Governors, Ryerson University, Toronto, Canada</i>
Apr. 2005 – Aug. 2011	<i>Associate Professor, Dept. of ECE, Ryerson University, Toronto, Canada</i>
Jan 2008 – July 2008	<i>Visiting Scholar, Institute of Advanced Telecommunications (IAT), Swansea University, UK</i>
Sep 2001 – Mar 2004	<i>Assistant Professor, Dept. of ECE Ryerson University, Toronto, Canada</i>
Sep 1997 – May 2001	<i>Teaching Assistant, Dept. of Electrical and Computer Engineering, University of Calgary, Alberta, Canada</i>
Dec 1994 – Aug 1997	<i>Research & Development Engineer, AT&T Telecom Products, Bangkok, Thailand</i>
May 1993 – Dec 1994	<i>Teaching Assistant, School of Advanced Technologies, Asian Institute of Technology, Bangkok, Thailand</i>
Mar 1992 – Apr 1993	<i>Assistant Lecturer, Dept. of Electrical and Electronic Engineering, University of Peradeniya, Sri Lanka</i>

Education

1997-2001	Dissertation 'Signal Processing for Radio over Fiber' University of Calgary, Canada PhD Electrical and Computer Engineering (2001 Canadian Best Paper Prize and a Patent)
1993-1994	Dissertation 'Design of Optical Wireless CDMA System' (Ranked First in the graduating class of 1994) Asian Institute of Technology (AIT), Thailand Masters in Telecommunications
1988-1992	University of Peradeniya, Sri Lanka B. Sc. (First Class Honors) in Electrical and Electronic Eng (Placed First out of 250 Students)

Personal Honors and Awards

- *Fulbright Canada Research Chair* in Computers, Science and Engineering, USA, 2025
- IEEE Communications Society '*Distinguished Lecturer*' for 2011-12.
- MAPNET Fellow under Erasmus Mundus Visiting Scholarship, Aston University, Birmingham, UK, August 2014
- Finalist of the *Top 25 Immigrant of Canada Award*, 2012, Nominated by Ryerson University
- [Alumni Spotlight, University of Calgary, Schulich School of Engineering, 2019](https://schulich.ucalgary.ca/alumni-donors/alumni/alumni-spotlights/xavier-fernando), <https://schulich.ucalgary.ca/alumni-donors/alumni/alumni-spotlights/xavier-fernando>
- IEEE Toronto Section Appreciation Awards, 2008, 2014, 2015, 2016
- Ryerson University, Faculty of Engineering, Architecture and Sciences, [Service Excellence Award](#) 2012
- *Engineering Excellence Award* from the Professional Engineers Ontario, Mississauga Chapter, January 2016
- First author of the paper received [First Prize](#) at the IEEE Canadian Conference on Electrical and Computer Engineering (CCECE'2001), 2001
- Top reviewers, Web of Science Award – 2016, 2017 and 2018
- Technological Advances in Science, Medicine and Engineering (TASME) [Lifetime Achievements Award](#), July 2023
- IEEE Communications Society (USA) [Chapter Achievement Award](#) as Toronto Chapter Chair, 2008
- [Professor of the Month Award](#) by IEEE Student Branch, Ryerson University, February 2017
- NSERC Postgraduate, TRILabs, ICORE (Alberta) and Finnish International Development Agency Scholarships during my grad studies.

Leadership Experience

- **Founding Director**, TMU Intelligent Communication and Computing Lab, Toronto Metropolitan University, Toronto, Canada, 2010 – present <https://www.linkedin.com/groups/3355245/> and <https://www.facebook.com/RyersonCommunicationLab>, Supervised 15+ Doctoral and Post Doctoral students, 13+ Research Associates. My Lab received over \$5,000,000 research funding since 2008.
- **General Chair**, IEEE Canada Humanitarian Technology Conference, Toronto, Canada 2017, www.ihtc2017.ieee.ca
- **General Chair**, IEEE Canadian Conference on Electrical and Computer Engineering, CCECE 2014, May 04-07, Toronto, Canada (<http://ccece2014.org>)
- **General Co-Chair**, IEEE Canadian Conference on Electrical and Computer Engineering, Toronto, Canada, 2027
- **General Chair** and Co-Editor of the proceedings, 6th International Conference on Applied Soft Computing and Communication Networks (ACN'23), Bangalore, India, on December 18-20, 2023, <http://acn-conference.org/2023/>
- **General Chair**, Springer International Conference on Applied Soft Computing and Communication Networks (ACN'20), Chennai, India, October 14-17, 2020- <http://acn-conference.org/2020/>
- **General Chair**, International Conference on Computing and Network Communications (CoCoNet'19) to be held at IIITM-K, Trivandrum, India, December 18-21, 2019, <http://coconet-conference.org/2019>
- **Chair**, IEEE Humanitarian Initiatives Committee of IEEE Canada, 2018
- **Chair**, IEEE Canada Central Area, 2018
- **General Chair** for the International Symposium on Applications of Computational Intelligence and Machine Learning in Networked Systems (ACMiNS), Manipal, India September 13-16, 2017, <http://icacci-conference.org/ACMiNS2017/committee.html>
- **General Chair**, IEEE Toronto International Conference – Science and Technology for Humanity (TIC-STH), organized by IEEE Toronto Section, September 26-27, 2009
- **Chair** (2012-2013) and Vice Chair (2010-11), *IEEE Toronto Section* (<http://toronto.ieee.ca>), Toronto is the largest IEEE Section in the world in terms of Chapters and affinity groups.
- **Chair**, IEEE Communications Society, Toronto Chapter, 2004-2010
- Member, [Board of Governors](#), Toronto Metropolitan University, 2009-2011, member of the *Finance Committee* and involved in various key decision makings that concern the University
- Chair, Department Hiring Committee, Toronto Metropolitan University, 2012-13

Professional Affiliations

- Senior Member, IEEE (COMSOC, Consumer Technology and, Vehicular Tech. Societies)
- Licensed Professional Engineer, Professional Engineers of Ontario, Canada (P. Eng.)
- Program Evaluator, ABET (Accreditation Board of Engineering Technology), USA. I have visited and evaluated US Universities for accreditation.

External Awards as a Supervisor

- Supervisor 'An Energy Harvesting Smart Bike' Bronze Prize winner, IEEE PIMRC, Frontiers in Networking Symposium, Sept 2023

- Supervisor, [Bronze Prize winning](#) project 'Wireless Treadmill Control using Heart Rate Monitoring' in the IEEE Microwave Theory and Techniques Society, '[MTT Alive 2010 International Design Competition](#)', 2010
- Co-Supervisor of the student paper that won the [Second Prize](#) at Sarnoff Symposium 2009, Princeton University, New Jersey USA
- Best Session paper, 'Single FBG All Optical De-Multiplexer for SCM ROF Links', International Conference on Signal Processing & Advanced Communications (SPAAC'16), Cherthala, Kerala, India, 2016
- Best paper 'Grey-Box Modeling of a Residential Multi-Zone Air Handling Unit (AHU) through Comprehensive Monitoring', Symposium on Thermal Energy & Networks, International Conference of Smart Grid Engineering (SEGE 2014), UOIT, Canada, 2014
- Supervisor of the project "IntelliChair: Assistive Technology for Powered Wheelchair Users", First prize winner, IEEE Humanitarian Initiatives Workshop, part of CCECE 2014.
- Project supervisor, "IntelliChair: Assistive Technology for Powered Wheelchair Users", Second Prize winner at the 2014 International Humanitarian Technology Initiative Conference in Montreal.
- Supervisor of the project, "Collaborative Robots for Rescue Missions in Underground Mines" won the Second prize at the Humanitarian Initiatives Committee Workshop of CCECE 2013.
- Supervisor of the project 'Aerial Search Unit' selected as finalists for the OCE Discovery Student Design Competition, May 18-19, 2011
- Supervisor of the project 'Wireless Smart Meter' selected as finalists for the OCE Discovery Student Design Competition, May 18-19, 2011
- Supervisor of the student poster presentations that won the First and Second Prize at Opto-Canada, SPIE Conference, Ottawa, Canada, May 2002

Internal Awards as a Supervisor

- Supervisor of the student Vanessa Hoang who won the David Platnick Memorial Award (EDP project Multi-Functional Robotic Cat), 2024.
- Supervisor of the Capstone Project 'Omnidirectional Robotic Car with Moving Arms' May 2022, Received the Dean's Best Project Prize under the Electrical Engineering Category.
- Supervisor of the Capstone Project, 'UWB Rescue Robot that could see through Obstructions'. May 2019, Received the Dean's Best Project Prize under Electrical Engineering Category.
- Supervisor of the Capstone Project, 'Semi-Automatic Robot Assistance'. May 2019, Received Silver Prize at the department level.
- Supervisor of the project 'Self Navigating Robot for Search and Rescue Operation' design excellence prize, Electrical and Computer Engineering, Ryerson University, 2015.
- Supervisor of the EDP project, 'Energy Harvesting Shoe Pad Design' that won the [President's prize](#) at the open house design competition, 2013
- Supervisor, [Gold Prize](#) winning EDP project 'Wireless Manager for Plug-in Electric Vehicles' 2012, Dept. of Electrical and Computer Engineering, Ryerson University
- Department of Electrical and Computer Engineering, Ryerson University, Research Excellence Award, Dec 2012
- Supervisor 'Cognitive Radio Sensor System for 800-2500 MHz' Fourth year thesis project that won [Ed Togwood Award](#) for Excellence, 2010
- Supervisor of the award-winning Design Project, Smart Info-Pad for Museums and Art Galleries, feature article at Toronto Star Newspaper, April 2007
- Co-author of the student paper that won the [First Prize](#) for Communications and Signal Processing, at International Conference for Upcoming Engineers (ICUE), Ryerson University, May 2003

In the News

- [Professor Xavier Fernando named Fulbright Canada Scholar](#). - Faculty of Engineering and Architectural Science Newsletter - Toronto Metropolitan University (TMU)
- [Florida Poly reaches new heights with record Fulbright participation](#)
- Ryerson university professor and making achievement with multiple innovations in technology, TIME FM-ITR Tamil Radio interview July 15, 2020
- Tamil One TV Interview 'Contact Tracking and COVID-19' with Senior Scientist Dr. Nades Palaniyar, Toronto Sick Kids Hospital and Dr. Nanda Nanthakumar, PhD, Bridgewater State University, MA, USA
- Building Canada's 5G future (CBA National (Online)), Date: May 24, 2019
- Quotes Prof. Xavier Fernando, <http://www.nationalmagazine.ca/en-ca/articles/law/in-depth/2019/building-canada-s-5g-future?feed=rss>
- Featured as Professor of the month by IEEE Student Branch, Ryerson University 26th, February 2017 <https://www.youtube.com/watch?v=zCe0ln8h2GY>
- Forget cell phones, wireless charging best use is electric toothbrushes (Toronto Star) Quotes Prof. Xavier Fernando, May 30, 2016, <http://on.thestar.com/1UdR5Uq>
- "When email was first introduced to the phone, it changed it into a multimedia device," said Ryerson University wireless telecommunications professor Xavier Fernando. - See more at: <http://humbernews.ca/smartphone-marks-23-years-of-innovation/>
- CP24 and CTV, Interview with Prof. Xavier Fernando new Toronto area codes, March 26, 2013
- IEEE Communications Society Blog, 'IEEE ComSoc Distinguished Lecturer Tour - COLOMBIA and PANAMA', <http://www.comsoc.org/blog/ieee-comsoc-distinguished-lecturer-tour-colombia-and-panama>
- IEEE Communications Magazine, Global Communications Newsletter, 'Distinguished Lecturer Tour of Xavier Fernando in South India' October 2012 <https://ieeexplore.ieee.org/document/6316770/>
- Toronto Star article, 'Prof's work plagiarized by profs' how Dr. Fernando's work plagiarized internationally, Feb 13, 2012
- Ryersonian (Ryerson newspaper) article now Dr. Fernando balances research and teaching, Nov. 22, 2011 Ryerson today, July 27, 2010 http://www.ryerson.ca/news/media/General_Public/20100727_rn_fernando.html
- X-Journals, <http://x-journals.com/2010/underground-wireless-communication-for-mines>
- ACM <http://cacm.acm.org/news/96717> -researcher-develops-underground-wireless-communication-for-mines/comments
- Newswise <http://newswise.com/articles/burying-the-lines-of-communication>
- NewsDrome, http://newsdrome.com/search/miners_news/burying-the-lines-of-communication-researcher-develops-underground-wireless-communication-for-mines-19158672
- Metals News, <http://le-iss.com/metals/?p=55747>
- PhyOrg, <http://www.physorg.com/news/2010-11-technology-wireless-underground.html>
- Ryersonian TV program, talking on safety in underground mines, October 2010

Research

In the past 30 years, I have worked on multiple projects, starting from Wireless communications, Optical wireless communications including Radio-over-Fiber, Infrared/Visible light communication, Smart grids, Smart buildings, Connected Electric and Autonomous vehicles, Tracking and Localization, Internet of Things, Aerial Terrestrial Networks, Machine Learning and AI. I have close to **300 publications including 3 books** and a few patents.

Research Profiles

As of Feb 2026

ORCID ID: 0000-0001-7120-528X ORCID recorded works – 226

<https://orcid.org/my-orcid?orcid=0000-0001-7120-528X>

Scopus Author ID: 6701314089

H-Index: 29, Publications: 239, Citations: 3302

Web of Science (<https://www.webofscience.com/wos/author/record/HMP-1814-2023>)

H-Index: 23, Indexed Publications: 199, Citations: 1950, Citing articles 1742, Citing Patents 24

Verified peer reviews – 589 (3 Top reviewer Awards since 2016)

Semantic Scholar: H-Index: 27, Publications: 222, Citations: 2,579

(<https://www.semanticscholar.org/author/Xavier-N-Fernando/1723437>)

Google Scholar: H-Index: 35, Publications: ~300, Citations: 5190, i10 index: 132

https://scholar.google.ca/citations?user=Ue_viVQAAAAJ&hl=en

Scientific Profiles: Author ID: 1188761 <https://sciprofiles.com/profile/xaviefernando>

Research Gate: <https://www.researchgate.net/profile/Xavier-Fernando>

H-index: 32, Articles: 308, Research Score 2,604, Citations 4,114

Research Funding (Lifetime total over \$3.3 Million)

1. Fulbright Fellowship, Performance improvement of Cellular V2X Communication, \$35,000, 2025
2. PI, NSERC Discovery Grant, Analysis, Design and Optimization Algorithms for Aerial plus Terrestrial Wireless Networks Enhanced with IRS, 265000, 2023-2028
3. PI, OCE VIP, A Full Duplex Wireless Mesh System, \$80,000 2022-2023
4. Toronto Metropolitan University Dean's Research Booster Funding \$10,000, 2022-2023
5. Principle Investigator (PI), MITACS Elevate PDF, A Reliable LoRa based Tracking and Monitoring System for Underground Mines, \$60,000, 2020-2021
6. PI, NSERC CRD 'A Comprehensive Intelligent Monitoring System for Mines' \$170,000 with PBE Canada, Dec 2019-2020
7. PI, Ontario Center of Excellence (OCE) under Voucher for Innovation and Productivity II (VIP II) Program 'Building a Scalable Inventory Management System for Advanced Manufacturing' in collaboration with Peytec Inc. (www.peytec.com), \$233,000, 2017-2018
8. PI, NSERC CRD Project, Building a Fully Automated and Descriptive Asset & Inventory Management System for Advanced Manufacturing, \$150,000, 2017-2018
9. PI, SOSCIP Talent Edge Post-Doctoral Fellowship, Title: Fusion and Analysis of Multi-sensor Miner Data using Smart Computing Platforms' \$115,000, 2017-2019
10. PI, NSERC Discovery Grant, Energy Harvesting Cognitive Wireless Sensor Networks, \$180,000, 2016-2022.

11. PI, NSERC CRD and OCE SOSCIP Smart Computing Challenge Grant, 'Wireless Sensing and Tracking in Harsh, Low-Light Underground Mines', \$400,000, 2016-2017 Nov.
12. PI, NSERC Engage Grant, 'Wireless Sensors and Controls for Fall Prevention Lights for Alzheimer Patients' \$25,000, Nov 2019
13. PI, Engage Grant, 'Range and Quality Enhancement of Full Duplex Wireless Mesh Transceivers' with Nautic Inc, \$25,000, 2016
14. Co-PI, Application Partitioning, Resource Management and Provisioning in Large Scale Cloud Systems, Grant, Funding Source: Ryerson University (Toronto, ON), Research Tools Funding 22,900
15. Co-PI, Radio Frequency Test Equipment for Wireless Communication Systems, Grant Funding Source: Ryerson University, \$35,000
16. PI, Engage Grant, \$25,000 'Telemetry data acquisition and transmission modules for motorcycles' in collaboration with Eat Sleep Ride Inc. 2015
17. PI, Engage Grant, \$25,000 'Rule based Reasoning for Anomaly Detection and Prediction of Heart/Stroke Attack using Wearable Sensors.' in collaboration with Health Management Systems Inc., March-June 2016
18. PI, NSERC CRD 'Wireless Performance Monitoring of Plug-in Electric Vehicles', Total Funding - 194,560 with the support from Hydro One, 2013-2016
19. PI, NSERC CRD \$300,000 on Green Underground Communication System, with the support from Mine Radio Systems, 2013-2015
20. MITACS Global link program grant, 'Cognitive Wireless System for Aerospace' \$5,000, 100%, 2014
21. PI of the NSERC Engage Grant, RFID based productivity and food traceability enhancement system, \$25,000, May 2014
22. Co-PI, Development of Residential HVAC and Air Conditioning Demand Management and Control System - Wireless Sensor Network Design, \$112,500 (33%) from TRCA and \$80,000 from MITACS, 2013-2014
23. MAPNET Erasmus Mundus Visiting Scholarship to stay and conduct research at ASTON University, UK, August 2014, \$8000.
24. Co-PI, MITACS Accelerate Grant, 'Improving Recyclability of Magnesium Alloy Castings for Automotive Applications' 50% of \$15,000, 2012
25. Co-PI, Radio Frequency Test Equipment for Wireless Communication Systems, Ryerson RTI, 33% of \$35,000, 2012
26. PI, NSERC CRD, Highly Reliable Communication Networks for Underground Mines, \$250,000 (75%) 2009-2010
27. PI, MITACS ACCELERATE Grant, Active Gate Driver Design with Remote PWM Gating \$30,000 with Honeywell Inc, 2009-2010.
28. ISTP Travel Grant to visit workshop in India, \$5000, 2011
29. Co-PI, research fund from CPFR, All Optical De-multiplexer for Radio over Fiber Systems, \$475,000 (33%), 2008-2009
30. PI, Faculty Research Grant (FRG) \$10,000, 2009
31. Co-PI, collaborative research grant with UOIT, Cognitive Sensor Networks, \$18,000, 2008-2009
32. Infrastructure Operating Fund (IOF) for CFI, \$28,000, 33%, 2007-2010
33. PI, NSERC, Discovery Grant, Signal Processing for Radio over Fiber Systems, \$75,000, 2007-2012
34. NSERC Discovery Grant, \$120,000, 2001-2006
35. Ryerson International Initiative Fund, \$36,000, 2006
36. NSERC USRA, \$9,000, 2005- 2006
37. Co-PI, CFI grant, \$250,000, 33%, 2003.

Research Supervision

Since 2001 I have supervised 15 Post Doctoral Fellows, 15 Research Associates, 13 Doctoral students (3 co-supervision) and 28 master's students (4 co-supervision). Our joint work has resulted in around 300 publications and 3 patents.

A few noteworthy examples are:

Dr. Wisam Farjow: President of Integrated Wireless Innovations Inc. (<https://www.i-wi.ca/>) and Adjunct Professor at TMU.

Peyman Moeni – Founder of Peytec (www.peytec.com) that was among the top 10 most promising IoT companies in Canada <https://www.linkedin.com/in/peyman-moeini/>

Shirley Arnold: GFX Hardware Eng. Manager, Intel Cor, USA.

Dr. Balasundaram Elamaram, Senior Manager at Logitech, San Francisco

Dr. Ajmery Sultana: Assistant Professor, Algoma University, Toronto, Canada

Dr. Anitha S. Kumar: Assistant Professor, Fairleigh Dickinson University, Vancouver, Canada

Dr. Sattar Hussain and, Salam Al-Juboori: Professors at Centennial College, Toronto, Canada

Dr. Arif Obaid: Founding President of Sust-Net (<http://sust-net.com/>) and a professor at Seneca College, Toronto, Canada

Dr. Nima Nikvand: Design Team Leader at Ontario Power Generation, Canada

Dr. Ahasanun Nessa: Senior Applied Scientist at QA Consultants, Hamilton, Ontario, Canada

Dr. Alston Lloyd: Systems Engineering Manager at PBE Group, Toronto, Canada

Dr. Atefeh H. Arani, AI/ML Expert and Team Lead, Australia, <https://www.linkedin.com/in/atefeh-arani/>

Hatice Kosek: Senior Solution Architect at Bell Canada

Other noteworthy alumni positions are Data Scientist at Bell Canada, Technical Solution Developer at Google, Software Dev. Manager at Amazon, Design Release Engineer at General Motors, Senior Advisor at Metrolinx and Senior Application Developer at CIBC (names withheld).

Please visit the LinkedIn website, 'TMU Intelligent Communication and Computing Lab: Present and Past Members' <https://www.linkedin.com/groups/3355245/> and <https://www.facebook.com/RyersonCommunicationLab> to see the profiles of my alumni.

Research Fellowships

- Fulbright Research Chair in Computers, Science and Engineering, Florida Polytechnic University, USA August- December 2025
- *Visiting Scholar*, Institute of Advanced Telecommunications (IAT), Swansea University, UK, January-July 2008.
- *MAPNET Fellow under Erasmus Mundus Visiting Scholarship assignment*, Aston University, Birmingham, UK, August 2014

Teaching and Design Supervision

I have taught the following course at Toronto Metropolitan University (formerly Ryerson University) between 2001 and present.

- Circuits and systems: ELE 202 (2nd year), ELE 302 (3rd year)
- Analog Communications: ELE 635 (3rd year),
- Digital communications: ELE 745 (4th year)
- Signals and systems: ELE 532 (3rd year)
- Optical communications: ELE 885 (4th year) (The optional fourth year Optical Communication Systems course is very popular, around 90 students register for this course every year)
- Optical Communication and Networks: EE8114 (graduate level)
- Engineering Design Projects: ELE 700, ELE 800 (4th year)

In addition to classroom teaching, I have consistently integrated innovative pedagogical approaches, such as hands-on laboratory exercises and collaborative learning projects, to enhance student engagement. My commitment to continuous curriculum improvement ensures that course content remains aligned with current industry standards and technological advancements.

Students nominated me for IEEE Professor of the Year Award twice

Tutorials

1. Communication Requirements for Autonomous and Electric Vehicles: Can Visible Light provide a viable alternative? Thursday, August 27, 2020, 10:00 – 11:00 am part of the International Conference on Wireless, Intelligent, and Distributed Environment for Communication (WIDECOM) August 26 – 27, 2020, Ryerson University, Canada
2. Energy Harvesting Wireless Sensors for Smart Cities, as a part of Computer Aided Modelling and Design of Communication Links and Networks (CAMAD 2016), Thomas Lounge, Oakham House, Ryerson University, Sunday, Oct. 23, 2016, 12.30-3.30 PM
3. Half day Tutorial, 'Saving Miners' Life: Innovations in Underground Communication Systems', May 08, at the Canadian Conference on Electrical and Computer Engineering (CCECE) 2011, Niagara Falls
4. Half day Tutorial at GLOBECOM 2009, Hawaii; this tutorial was selected to be delivered online via IEEE COMSOC Tutorial Now program.
5. 3 hours tutorial at the University of Toronto, School of Continuing Studies 'Smarter and Greener Buildings' June 2009
6. Half day Tutorial at Sarnoff Symposium, *Princeton University*, New Jersey, March 30, 2009
7. Half day teaching session on fiber optic communications at Wipro Inc., India (Wipro is the largest R&D service provider in India with over 95,000 employees). This was broadcasted through a video link to Chennai and Bangalore, two major cities and attended by hundreds of engineers, 2008.

Selected Hardware/Software Prototypes

Over the years I have supervised over a hundred fourth year capstone design projects in various areas. Many of these projects have received internal and external recognition. Visit the [TMU-ICC Lab YouTube Channel](#) to see the video of a few noteworthy projects. A few are listed below.

- The Smart Bike
- Lidar based Mini Autonomous Car
- Multifunctional Walking Robotic Cat
- Object picking Omnidirectional Rescue Robot
- SARA – Semi Automatic Robot Assistant
- 3-D Image Processing based intelligent glove for visually impaired.
- Electronic mind reader that predicts intended words of speech impaired subjects from ECG waveforms.
- Detection of hidden objects using UWB radio signals.
- Energy from the Wall – A plug and use type energy harvester
- WEBMIMS: A Web-based Multimedia Information System; conferencing software
- Dynamic Multi-Wavelength Simulink™ model for Erbium Doped Fiber Amplifiers
- RGB Color Mixing Controllers of Solid-State Lighting,
- Wireless Device Detection System for Hospital Environments
- Wireless Treadmill Control using Heart Rate Monitoring – Won Bronze prize from IEEE Microwave Theory and Techniques Society
- Wireless Controller for Solid State Lights
- Automatic Parking Meter with Wireless Control
- Wireless Snow Blower, hardware/software prototype
- Underground Wireless Sensor Network
- Wireless Handheld Smart Info-Pad (SIP) – Highlighted in Toronto Star
- Smart Wireless Electric Meter for Micro Power Generators
- Wireless Blood Pressure Monitor
- Smart Home Environment Controller
- RFID based Talking Photo Album
- RFID based medicine usage logging system for elderly people.
- Intelligent Wireless Headphones (that mute themselves when you look away from the TV)
- Lighting and Heating Control for Smart Homes
- Wireless wetness detector system for diapers – that automatically alert parents when the baby is wet for certain duration.
- Wireless Power Charger for Smart Phones
- Wireless Power Converter for Aircrafts
- Search and Rescue Unit for Trapped Miners
- Wireless Manager for Plug-in Electric Vehicles
- Cognitive radio transceiver design using software defined radio
- Energy harvesting wireless sensor design using solar power and Maximum Power Point Tracking
- Cell Phone based Personal Security Device (that calls 911 stealthily when the victim is attacked)
- Energy Harvesting Combustion Analyzer using the heat from furnace that detects the amount of CO and CO₂.
- Autonomous Robots using Image Processing
- Underwater Communicating Alarm System for Rescuing Drowning Children
- Intelligent Wheelchair (intellichair) for the disabled, is a parasitic control device system for motorized wheelchairs.
- Amusement Ride Intelligent Safety Enhancement (A.R.I.S.E) system that ensured the safety of am riders (in collaboration with Prof. Catherine Woodcock)

Selected PhD External Examinations

1. Sneh Patel, 'Investigation of Spiral-Based Structures in Inductively Coupled Mems Pressure Sensors and Implantable Antennas' TMU, Nov 2024, Sup: Marco Antoniadis
2. Taha Sajjad, 'High Speed molecular Communication' Faculty of Graduate Studies, Doctor of Philosophy in Electrical Engineering and Computer Science, York University, Supervised by Andrew Eckford
3. Fatemeh Safari, 'A novel QoS-aware cross-layer framework for adaptive routing in MANETs, The University of Guelph, Supervisors Dr. Daniel Gillis (CS) and Dr. Herb Kunze (Math)
4. Merlin Asha Manohar Johnson, 'Distributed Optical Fiber Sensor Based on OTDR for Landslide Monitoring' Taylor's University, Malaysia, June 2023
5. Priya Dharmalingam, 'Defect induced semiconductor probes for ultrasensitive detection of metastatic cancer' Mechanical Engineering, Toronto Metropolitan University, Sup: Dr. Venkatakrishnan
6. Remya S, Computer Science and Engineering, 'Performance Evaluation of Optimized and Adaptive Neuro Fuzzy Inference System for Predictive Modeling in Agriculture' Vellore Institute of Technology, India, March 2021
7. Bapi Debnath (Reg. No. 2017271005), Design and Analysis of Mems Based Piezoelectric Vibration Energy Harvesters Comprising Different Composite Shapes For Enhanced Performance in Low Frequency and Acceleration Related Applications' National Institute of Technology, Nagaland, India, Jan 2021
8. Fabian Andres Medina Becerra, 'Methodology for deploying WSN-based IoT nodes in confined/underground scenarios' Advisor: Eduardo Avendaño Fernández, Co-advisor: Jorge Enrique Espíndola Díaz, Universidad Pedagógica y Tecnológica de Colombia (UPTC), Sogamoso, Colombia, Dec 2020
9. Ibrahim M Abdalla Aboharba 'Performance Evaluation of OFDM with Index Modulation system in Wireless Channels" Supervisor - Raveendra Rao, The University of Western Ontario, Dec 2020
10. Chathura Illangakoon, 'Fixed-Rate Transmission of Correlated Analog Sources over Fading Multiple-Access Channels: Performance Bounds and Code Design' Supervisor Prof. Pradeepa Yahampath, University of Manitoba, July 2020
11. Hazem Mohamed Saad Ibrahim, 'Design and Performance Analysis of Next Generation Heterogeneous Cellular Networks for The Internet of Things' Supervisor Prof. Uyen Trang Nguyen, York University, Nov15, 2019
12. Mr. Moftah Ali, "Energy-Efficient Multicarrier and Multicarrier-CDMA Systems" University of Western Ontario, Supervisors Dr. Parsa and Dr. Raveendra Rao, Nov 08, 2019
13. Shiwei Huang, 'Optimization-Based Resource Allocation and Transmission Scheduling for Wireless Networks' University of Manitoba, Supervisor Jun Cai, Jan 09, 2018
14. Emammer K.H Shafter, OFDM System with g-CPFSK Mapper: Properties and Performance Supervisor - Raveendra Rao, the University of Western Ontario, July 2018
15. Mr Praveen Edward James (Student ID: 0320163), 'A LSTM Based Hybrid Speech Processing System for Natural Language Processing' Taylor's University, Malaysia, 25 may 2017,
16. Christopher Chan, 'A High-Fidelity Simulation Algorithm Capable of Modeling Spatial Impact Points as a Result of Successful Neutralization of Improvised Explosive Devices' Supervisor: Alex Ferworn, Ryerson University, Dept. of Computer Science, 2015
17. Hamidreza Boostanimehr 'Resource Allocation and Performance Evaluation in Heterogeneous and Relay based Wireless Networks' University of British Columbia (UBC), 2014
18. Omar M Sheikh, 'A Cross Layer Paradigm for Throughput Optimization in Distributed and Application-Centric Wireless Sensor Networks', Supervisor, S. A. Mahmoud, Carleton University, 2011

Invited Talks

Noteworthy Invited Keynote/Plenary Talks

1. The Energy Harvesting Myth in Internet of Things, 8th International Conference on Devices, Circuits, and Systems (ICDCS 2026) at Karunya Deemed University, Coimbatore, India, 27th March 2026
2. Information and Communication Technologies for Sustainability, International Conference on Computing, Communication, Control and Cyber-Physical Systems, I5CPS-2026, 26 - 27 Feb 2026, National Institute of Technology, Puducherry, India.
3. Handling Challenges of Generative AI Disruptions in Education, 4th Annual Canada-Caribbean Institute Research Symposium, 2026, University of West Indies, Trinidad, Feb 20, 2026.
4. Information and Communication Technologies for Sustainability, Florida Polytechnic University, Lakeland Nov 18, 2025
5. Vehicular Communication for Smart Transportation, MDPI World Cities Day 2025 Session 2 Part of the MDPI World Cities Day Webinar series, 31 October 2025
6. Visible Light Communication for Vehicular Applications, University of Central Florida, Orlando, USA, Oct 15, 2025
7. Radio Over Fiber for Broadband Wireless Communication, **University of Cambridge, UK, June 9, 2008**
8. Invited Talk, Radio over Fiber, **City University, London, UK, April 14, 2008**
9. AI in Education: AI Digital Assistants, AI in Education Forum, Toronto, 25-27 November 2024, Chartered Institute of Professional Certifications, Double Tree by Hilton *Toronto*, Nov 26, 2024.
10. Sustainable IoT in the realms of Internet of Vehicles, March 13-14, 2023, Rome, Italy, <https://www.albedomeetings.com/2023/renewablemeet>
11. Public Lecture '[An Introduction to Internet of Things](#)', Toronto Public Library, Jan 26th 6-7 PM EST,
12. Keynote Speech, 'Sustainable Internet of Things' 6th International Conference on Data Mining, Communications and Information Technology, April 28, 2022, *Shanghai China*
13. Canadian Wireless Spectrum Scenario, Workshop organized by US Wireless Spectrum Research and Development Senior Steering Group (WSRD SSG) at CSAIL, **MIT, Boston, USA**, April 23-24, 2013
14. Information and Communication Technologies for Sustainability, VIT Chennai, India, Oct 21, 2024
15. Invited Seminar, Internet of Things in Everyday Life, Alumni Association of the University of Peradeniya, Ottawa Chapter, Canada, Nov 27, 2021
16. ICT and IOT for Smart Cities, Global Asian Institute of Technology, Alumni Association Symposium (AITAA) Symposium, Viet Nam, Nov 21, 2021
17. ICT for Sustainable India, Christ University, India, Oct 04, 2024
18. Keynote Speech 'Sustainable Internet of Things for Agriculture' International Conference of Agriculture, Healthcare and Green Computing Perspective of Communication Technologies, 28-29 April 2022, AICTE
19. Keynote Speech, Sustainable Internet of Things, 2022 International Mobile and Embedded Technology Conference (MECON 2022), 10-11 March 2022, Amity University, Uttar Pradesh, India
20. Plenary Talk, International Conference on Recent Trends in Applied Sciences and Computing Engineering (RTASCE 2021), Organized by VIT Bhopal, 17-19 Dec 2021
21. Keynote Speech, Artificial Intelligence in Wireless Communications, Second International Conference on AI for IOT, AIOT 2022, 07-08 April 2022, www.vit.ac.in/AIoT2022
22. Keynote Talk, Sustainable IoT for Smart Cities, International Conference on Intelligent Computing Systems, Mother Theresa Women's University, Kodaikanal, India, October 29th, 2021
23. Keynote talk, IoT for the Developing World, 9th International Conference on "Innovations in Electronics & Communication Engineering (ICIECE-2021)" Guru Nanak Institutions, Hyderabad, India, Aug 13th, 2021.
24. Keynote talk, Upcoming Technologies for an Interconnected society, 3rd International (Virtual) Conference on Recent Trends in Advanced Computing, 17th-18th December 2020 - VIT Chennai
25. Tutorial, Communication Requirements for Autonomous Electric Vehicles: Can VLC provide a viable alternative?' Springer Conference on Wireless Intelligent and Distributed Environment for Communications (WIDECOM-2020), Virtual, Aug. 27, 2020

26. Keynote talk 'Sustainable IoT in the Realms of 5G Wireless Networks' Chennai Institute of Technology Knowledge 4.0 Technical Webinar Series, July 02, 2020
27. Xavier Fernando 'Addressing the Challenges of V2X VLC Communications' SPIE Photonic North, Niagara Falls, May 28, 2020
28. Keynote, 'Data Science and Intelligent Systems' Mother Theresa Women's University, Madurai, India, Dec 18th, 2019, Sponsored by Department of Science and Technology (DST), India
29. Keynote, 'Machine Learning and Visible Light Communications for Autonomous and Electric Vehicles' Computing and Communication Network Conference (CoCoNet2019), Trivandrum, Kerala, India, Dec 19th, 2019.
30. Keynote 'Southern Ontario Smart Computing Platform (SOSICIP) Application in Smart Mines' Smart Mines 1.0, Adelaide Hotel, Toronto, Sept 20, 2018
31. Plenary talk, 'Electric Vehicles – The Mobile Portion of the Smart Grid' International Conference on Electronics and Electrical Engineering, Barcelona, Spain, July 26-27
32. Keynote speech, 'Optical Means for 5G Wireless Networks' 2nd Global Summit & Expo on Laser Optics & Photonics, Rome, Italy June 14-16, 2018
33. Invited Talk, 'Optical Techniques for 5G Wireless Networks', IEEE 5G and Beyond Testbed Workshop Co-located with IEEE VTC 2017, Toronto, organized by **IEEE 5G Initiative Testbed Working Group**, Sunday 24 Sep 2017, Hilton Toronto
34. Invited Talk 'Microwave Photonics for Fiber Wireless Systems', BIT's 3rd World Congress, March 15-18, Thailand <http://www.bitcongress.com/wcsm2017/ScientificProgramme2.asp>
35. Invited Talk 'Wireless Sensing and Tracking in Harsh, Low Light Environments', Smart Computing for Mining Workshop hosted by SOSICIP, October 27, 2016, Goldcorp Mining Innovation Suite, Lassonde Institute of Mining, University of Toronto.
36. Opening Keynote Speech, 'Upcoming Technologies for an Interconnected Society' Delivered at 2015 IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies, <http://ewh.ieee.org/conf/aeect/Program.html> Dead Sea, November 03, 10-11 AM, Jordan,
37. Plenary talk 'Energy Harvesting Wireless Sensors for Internet of Things' delivered at 3rd International Conference on Signal Processing, Communication and Networking (ICSCN 2015), March 26, 2015
38. Expert Talk, 'Trends in Wireless Technology in Canada', November 13, 2014, delivered at Sino-Canada Technology Exchange Centre, attended by 28 senior delegates from the Chinese State organizations.
39. Communication Solutions in Confined Spaces, Date and time: Monday, June 30, 2014, at 11 am, Room 418, Macleod Building, **University of British Columbia, Vancouver**
40. Keynote talk, 'Upcoming Technologies for the i-Society, and their Limitations' i-society conference, University of Toronto, June 24, 2013, Technically co-sponsored by IEEE <http://www.i-society.eu/Keynote%20Speakers.html>
41. Invited Opening Keynote Talk, 'Smart Grid for India's Power Needs' International Conference on Security in Computer Networks and Distributed Systems, Institute of Information Technology and Management, Kerala India, Oct. 11, 2012
42. Invited Talk, International Conference on Security of Internet of Things (SecurIT 2012) August 17 – 19, 2012 at Amrita University in Kerala, India, sponsored by ACM/SIGSAC
43. Keynote talk 'Communication Requirements for the Smart Grid', Connections Symposium, Department of Electrical and Computer Engineering, University of Toronto, BA1130, May 15, 2012
44. Invited Talk 'Research Directions in Underground Communication Systems', April 27, 2012, at the Centre of Excellence in Mining Innovations (CEMI), Sudbury, Ontario.
45. Invited Plenary Talk 'A New Perspective on Spectrum Sensing for Cognitive Sensor Networks' International Conference on Recent Trends in Information Technology (ICRTIT), 2012 DOI: 10.1109/ICRTIT.2012.6206846, 2012, Page(s): 565-569
46. Plenary online I: Cloud computing for Healthcare and Medical applications, Third International Conference on Advanced Computing, IEEE, 2011
47. Invited Plenary Talk (Online), 'Information and Communication Technologies for a Greener World' Third International Conference on Advanced Computing, 14-16 December 2011, Chennai, India

48. Invited Talk, 'Wireless Transmission of Biomedical Signals in Hospital Environments' Auditorium (first floor), Hospital for Sick Kids, 555 University Avenue, Toronto M5G 1X8, July 02, 2011
49. Invited talk 'ICT for Smart Grid', Joint Ryerson University/York University Workshop on Energy, June 21, 2011
50. Invited lecture, 'Communication Requirements for the Smart Grid' International Science and Technology Partnerships Canada (ISTP) workshop, Chennai, India, January 2011.
51. Invited talk at McMaster University, organized by IEEE Hamilton Section, 'Underground Communication Systems', February 01, 2011 (http://meetings.vtools.ieee.org/meeting_view/list_meeting/4375)
52. Invited presentation at the third CPFR Advances in Photonics Fabrication Workshop at the National Research Council (NRC), on March 5, 2009, organized by the Centre for Photonics Fabrication Research at Carleton University, the CPFC, the **Ottawa Photonics Cluster**, and the Ottawa Photonics Research Alliance (OPRA), Canada
53. Invited Talk Optical Wireless Communications, **Institute of Advanced Telecommunications, IAT, Wales, Swansea, UK**, 2008
54. Plenary talk 'Broadband Access Networks', International Conference on Signal Processing and Communication Networks (ICSCN), Madras Institute of Technology, Anna University, Chennai, Jan 2008
55. Invited Talk 'Research Trends in Broadband Access Networks', IEEE Madras Section (<http://www.ewh.ieee.org/r10/madras/>), August 2006
47. X. Fernando, S. Krishnan and D. Androutsos 'Processing, Protecting and Providing Multimedia Information' Half day symposium presented at IEEE Toronto Section, Signal Processing Society, May 01, 2006 (<http://toronto.ieee.ca/events/may0106.htm>)

Expert Panel Member

- Member of the Automotive Review Panel of the Ontario Research Fund – Research Excellence Program (ORF-RE) Round 12, Nov. 2023
- Panelist, 'Sustainable IoT', organized by IEEE Bombay Section and O P Jindal Group, July 04, 2020
- Panelist, 'Smart Transportation for Smart Cities' 6th Annual Smart City and IoT Expo, <https://smarcitiesexpoworldforum.ca/> Metro Toronto Convention Centre, October 9, 2018
- Panelist, Workshop - Technology & Market Challenges, part of the Beyond Lighting Conference and Workshops organized by the Smart Sustainable Lighting Network at University of Toronto, Mississauga, Campus May 02, 2017
- Panel Member, 'Green Energy Efficient Methods for Wireless Sensor Networks used in 24X7 Monitoring Applications. What are the solutions available? How can we improve them?' part of the First IEEE International Workshop on Sensor Networks for Intelligence Gathering and Monitoring, May 2011, Niagara Falls
- Panel Member, 'Approaching Disaster Management in Engineering Education and Research' part of the workshop on Connecting Engineering Applications and Disaster Management, May 2011, Niagara Falls
- Panel Member, 'Impact of 3G Wireless Networks in India' International Conference on Signal Processing, Communications and Networking, Anna University, India, January 2008

IEEE Distinguished Lectures

1. Saving Miners Life, Innovations in Underground Communication Systems, at the Universidad ICESI, Cali, Colombia, 8.30-9.30 AM, sponsored by **IEEE Colombia Section** also Keynote speech of the COLCOM'2012 Conference, May 18, 2012, <http://ieee-colcom.org/programa-2/>
2. Communication Requirements for the Smart Grid, at the Universidad de los Andes, attended by over 75 audiences, sponsored by IEEE Colombia Section, 4-5 PM, May 19, 2012
3. Saving Miners Life, Innovations in Underground Communication Systems, at the Universidad de Los Andes, attended by over 75 audiences, sponsored by IEEE Colombia Section, 5-6 PM May 19, 2012

4. Research Direction in Telecommunications, University of Panama, University of Panama, Panama City, IEEE Panama Section, 11 AM – 12 PM, May 22, 2012
5. Communication Requirements for the Smart Grid, Panama City, IEEE Panama Section, 6-8 PM, May 22, 2012 https://meetings.vtools.ieee.org/meeting_view/list_meeting/12289
6. Communication Requirements for the Smart Grid, Madras Institute of Technology (MIT) Campus of Anna University, Chennai, India on July 11th, 2012
8. Radio over Fiber for Wireless Communications, at Anna University Guindy Campus, hosted by IEEE Chennai Section, July 12, 2012
9. The Smart Grid, National Institute of Technology (NIT) at Calicut, Kerala, India July 13, 2012
10. Wireless Sensor Networks for Green Buildings, Kochin IEEE Subsection, India, July 14, 2012
11. 'Low Interference Wireless Communications for Biomedical Applications' at the Centre for Development of Advanced Computing (C-DAC), Thiruvananthapuram, Kerala, hosted by IEEE Kerala Section, India, July 15, 2012
12. 'Radio over Fiber for Wireless Communications', at the Indian Institute of Science (IISc), Bangalore, hosted by IEEE Karnataka Section, July 17, 2012

Other Invited Talks

17. AI based Digital Technologies in Teaching, Toronto Metropolitan University, Teaching Conference, May 19, 2025
16. ICT for Sustainable India with Autonomous/Electric Vehicles as a Case Study, Vellore Institute of Technology, March 26, 2025
15. Sustainable Internet of Things, Mother Teresa Women's University, Madurai, India July 11, 2022
14. Technology Directions, Amrita University, Amritapuri, Kerala, India, July 1, 2022
13. Research Trends in Wireless Communications, Coimbatore Institute of Technology, June 24, 2022
12. Innovations in Mine Communications, Centre for Mining, Anna University, Chennai, June 13, 2022
11. Sustainable Internet of Things, Dept. of Computer Science, Anna University, Chennai, June 10, 2022
10. Expert Speaker in Valedictory Session of the International Webinar on Higher Education in the Era of Global Pandemic, Organized by NAS College, Meerut, Uttar Pradesh, India
9. Career Opportunities in Canadian Market. Networking and Fellowship Night (ENGNET), organized by the Alumni Association of the University of Peradeniya, Canada, Toronto, Canada, February 15, 2020
8. Alumni talk 'Successful Career after your PhD' Faculty of Engineering, University of Calgary, invited by William Rosehart, Dean of Engineering and Matthew Burns, Director University Advancement, October 10th, 2018
7. Radio over Fiber and Recent trends in Wireless Communications, Asian Institute of Technology, Thailand, March 16, 2017
6. Welcome Address, IEEE COMSOC 5G Wireless Network Workshop, University of Toronto, November 14, 2015, <https://www.5gsummit.org/toronto>
5. Challenges in Radio over Fiber Technology for Broadband Wireless Access, delivered at the Aston Institute of Photonic Technologies, August 2014, Faculty of Engineering and Applied Sciences, Aston University, Birmingham, UK
4. Invited webinar, 'Wireless Communication Solutions for the Aerospace Industry' Honeywell Inc., Mississauga, Canada, July 2011
3. Invited Talk, Vellore Institute of Technology (India), August 2006
2. 'Multimedia Delivery over Optical Wireless Access Networks' tutorial given at the International Conference of Upcoming Engineers (ICUE; <http://www.icue.ca>), Waterloo, Canada, May 2006
1. Invited talk, 'IPTV, Voice over IP and TV over Phone Line: The Changing Scenario of Multimedia Delivery' seminar given at 10th Technological Advances in Science, Medicine and Engineering Workshop, University of Guelph, July 2006 (<http://www.tamilscentist.org/>)

Service

Journal Editorship

- Associate Editor, **IEEE Journal on Internet of Things** (JIOT), 2021 Jan - 2022 Dec.
- Associate Editor, IEEE Consumer Electronic Magazine, 2017- 2022
- Guest Editor, Technologies, Special Issue 'IoT Enabling Technologies and Applications' 2024-2025
- Guest Editor, Technologies, Special Issue 'Technological Advances in Science, Medicine, and Engineering' 2024
- Guest Editor, Future Internet, Special Issue "AI, Machine Learning and Data Analytics for Wireless Communications" 2021-22
- Guest Editor, Smart Cities, 'Novel Approaches for Cloud Computing Systems that Supports Smart Cities' 2020
- Guest Editor, Elsevier journal on Computers and Electrical Engineering, 2019
<https://www.journals.elsevier.com/computers-and-electrical-engineering>
- Guest Editor, Wiley International Journal of Communication Systems, Special Issue on "Ubiquitous Clouds and Communication Networks" DOI: 10.1002/dac.4744
- Guest Editor, Journal of Ambient Intelligence and Humanized Computing, Special issue on Predictive Big Data Analytics and healthcare informatics for COVID-19, Springer Lecture Notes in Networks and Systems Series; <https://www.springer.com/series/15179> ISSN: 2367-3370
- **Editor in Chief**, IRO Journal of IoT in Social, Mobile, Analytics, and Cloud (ISMAL), 2019-
<http://irojournals.com/iroismac/editorialboard.html>
- Guest Editor, Wiley International Journal of Communication Systems, Special Issue on Sustainable Wireless Personal Networks, with V. Suma and Robert Bestak 2019-20,
<https://onlinelibrary.wiley.com/journal/10991131>
- Associate Editor, Elsevier Journal of Computers and Electrical Engineering, Special Issue on Soft Computing Approaches for Sustainable Systems, 2017
- Associate Editor for Int. Journal of Communication Networks and Distributed Systems, Inderscience Publication, UK, 2009-2015
- Associate Editor, Network Protocols and Algorithms journal, 2010-2015
(<http://www.macrothink.org/journal/index.php/npa>)

Edited Books

- Modern Wireless Communication Systems and Networks: Design, Practice, and Implementation, Edited by Budhaditya Bhattacharyya, Anindita Kundu, Anantha Krishna Chintanpalli and Xavier Fernando Taylor and Francis Publishers, 2026, CRC Press, DOI: 10.1201/ 9781003659150
- Nirbhay Chaubey (nirbhay@ieee.org), Xavier Fernando and, Neha Chaubey 'Intelligent Edge Computing for Autonomous Aerial and Vehicular Systems ISBN13: 9798260006856, EISBN13: 9798260006870, IGI Global Scientific Publishing

Edited Conference Proceedings

E18, Guest Editor, Web of Science Indexed International Conference on "NextGen Engineering Technologies and Applications for Sustainable Development (ICNEXTS'25)" 11th & 12th December 2025, Chennai, India

- E17 Editor, Computer, Communication, and Signal Processing. Smart Solutions Towards SDG, 8th IFIP TC 12 International Conference, ICCCS 2024, Chennai, India, March 20-22, 2024, <https://link.springer.com/book/10.1007/978-3-031-73617-9>
- E16 Editor, proceedings of the 2nd International Conference on Advances in Computing, Communication and Security (I3CS-2023), 01-03 June 2023, <https://www.i3cs2023.com>
- E15 Co-Editor, Proceedings of the International Conference on Computer Networks, Big Data and IoT (ICCB 2021), <https://link.springer.com/book/10.1007/978-981-19-0898-9>
- E14 Technical Program Chair and guest editor, Proc. of the 3rd International Conference on Pervasive Computing and Social Networking (ICPCSN 2023), 9-10 March 23, Salem India, <http://icpcsi.in/2023/> <https://link.springer.com/book/10.1007/978-981-19-2840-6>
- E13 Guest Editor of the Conference Proceedings, Springer International Conference on Big Data and Cloud Computing, ICBCC 2022, organized by VIT, Chennai
- E12. Co-Editor, Proc. of the Springer International Conference on evolutionary computing and mobile sustainable networks ICECMSN 2021, held in Bangalore, India, 2021 <https://link.springer.com/book/10.1007/978-981-16-9605-3>
- E11. Co-Editor, Proc. of the Springer International Conference on Inventive Communication and Computational Technologies conference (ICICCT 2021 and ICICCT 2022), 25–26 June 2021 <https://link.springer.com/book/10.1007/978-981-16-5529-6> and <https://link.springer.com/book/10.1007/978-981-19-4960-9>
- E10. Co-Editor, Proc. of the Springer International Conference on Soft Computing for Security Applications (ICSS 2021), Dhirajlal Gandhi College of Technology, Tamil Nadu, India, June 2021 <https://link.springer.com/book/10.1007/978-981-16-5301-8>
- E9. Editor, Proc. of the "International Conference on Advances in Computing, Communication and Security (I3CS)" 03-05, March 2021 at National Institute of Technology-Kurukshetra, India, <https://i3cs2021.org/> <https://link.springer.com/book/10.1007/978-981-16-8403-6>
- E8. Corresponding Editor, Springer Proc. of the International Conference on Applied Soft Computing and Communication Networks (ACN'20), Oct. 14-17, 2020, Chennai, India www.acn-conference.org/2020 available at <https://www.springer.com/us/book/9789813361720>
- E7. Editor, Proc. of Second International Conference on Evolutionary Computing and Mobile Sustainable Networks (ICECMSN 2020) organized by Sir M. Visvesvaraya Technological University (VTU) on 20-21, May 2020, <https://link.springer.com/book/10.1007/978-981-15-5258-8>
- E6. Corresponding Editor, Springer Lecture Notes on Data Engineering and Communications Technologies – Proc. of the International Conference on Computer Networks, Big Data and IoT (ICCB 2020) <https://link.springer.com/book/10.1007/978-981-16-0965-7>
- E5. Springer Lecture notes on Data Engineering and Communication Technologies – Proc. of the International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018. <https://link.springer.com/book/10.1007/978-3-030-03146-6>
- E4. Proceedings of the International Conference on ISMAC in Computational Vision and Bioengineering 2018 (ISMAC-CVB), Pandian, D., Fernando, X., Baig, Z., Shi, F. (Eds.), 800 pages <https://link.springer.com/book/10.1007/978-3-030-00665-5>
- E3. Proceedings of the IEEE Humanitarian Technology Conference, 2017, Sean Dunn, Xavier Fernando, <http://www.ihtc2017.ieee.ca/>
- E2. 'Proceedings of the IEEE Canadian Conference on Electrical and Computer Engineering' consist of 260 technical papers and editorial totaling 1220 pages Sean Dunn, Xavier Fernando, <http://www.ccece2014.org>
- E1. Robert Allison and Xavier Fernando 'Proceedings of the IEEE Toronto International Conference on Science and Technology' consist of 180 technical papers and editorial totaling 910 pages, <http://toronto.ieee.ca/tic-sth2009/>

Service to the Profession

- Publicity Chair, ICSPIC 2024, 2024 7th International Conference on Signal Processing and Information Communications, Manila, Philippines, April 24-26, 2024
- Steering Committee Chair, 2023 Asia Conference on Machine Learning, Algorithms, Modeling and Data Analysis (MLAMDA 2023) held in Xiamen, China during December 8-10, 2023, <http://www.mlamda.net>
- TPC Chair, IEEE International Humanitarian Technology Conference (IHTC), December 2-4, 2022, IEEE Regions 7-9, Canada, Virtual
- Technical Program Chair, International conference on Computer, Communication and Signal Processing (ICCCSP '23) held on 4th to 6th January 2023, SSN College of Engineering, Chennai, India.
- Technical Program Chair and Guest Editor of the Conference Proceedings, Third International Conference on Evolutionary Computing and Mobile Sustainable Networks (ICECMSN 2022) organized by RV Institute of Technology and Management, Bengaluru, India, 26-27 September 2022, <http://icssc.com/2022/>
- Technical Program Chair and Guest editor of the Conference Proceedings, 5th International conference on I-SMAC <https://i-smac.org/2021/> (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC 2021), 23-24 April 2021
- Technical Program Committee Chair, Second International Conference on Evolutionary Computing and Mobile Sustainable Networks (ICECMSN 2021) organized by Visvesvaraya Institute of Technology, on 20-21, May 2021, <http://icssc.com/2021/>
- TPC Track Chair, ICC 2018, Energy Harvesting Systems
- Publicity Chair, IEEE International Conference on Consumer Electronics (ICCE 2019), January 2019, in Las Vegas, USA <http://www.icce.org>
- Publicity Chair, IEEE International Conference on Consumer Electronics (ICCE 2018), January 2018, in Las Vegas, USA <http://www.icce.org>
- Honorary Chair, IEEE Vehicular Technology Conference, Workshop on Resource Allocation and Spectrum Management in Internet of Things (IoT) Heterogeneous Networks, Fall 2017
- Track Chair, IEEE PIMRC 2017, Signal Processing for Wireless Communications.
- TPC Track Chair, ICC 2013, Access Systems and Networks
- Local arrangements and Finance Chair, International Conference on Noise and Fluctuations (ICNF 2011), Toronto, Canada
- TPC Track Chair, GLOBECOM 2011, Radio and Optical Wireless Access Networks
- Chair, Symposium on Microwaves and Photonics in Access Networks, Ottawa, Canada (<http://www.micpan.org>), August 2007, technically co-sponsored by ICST
- General Co-Chair, International Conference for Upcoming Engineers (ICUE), 2004
- TPC Co-Chair of the Access Networks and Systems track, GLOBECOM 2011 (GLOBECOM is the world's largest Telecom conference)
- Tutorials & Workshops Chair, IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), Niagara Falls, 2008 & 2011 (<http://ieee.ca/ccece08/comm.php>)
- Tutorial Chair, International Conference on Ad Hoc Networks, Niagara Falls, Sept 2009 (<http://www.adhocnets.org>)
- Advisory and Review Committee Member, Second International Conference on Intelligent Cyber Physical Systems and Internet of Things (IICPSI 2024), 28-30 August 2024 <https://icicpi.com/2024/>
- Technical Program and Advisory Committee Member, 6th International Conference on Recent Trends in Advanced Computing (ICRTAC'23)", 14-15 Dec 2023 organized by Vellore Institute of Technology, Chennai
- Reviewer for many promotion applications from several international and Canadian Universities.
- Advisory Committee Member, 2nd International Conference on Applied Artificial Intelligence and Computing Systems (ICAIC 2023), 4-6, May 2023, Salem, India, <http://icaaic.com/2023/>
- Advisory Committee Member, International conference on "Innovations in High-Speed Communication and Signal Processing" (IHCSPP 2022) sponsored by IEEE and IETE, 10th to 11th December 2022.
- Advisory Committee Member, 7th International Conference on Data Mining, Communications and Information Technology (DMCIT 2023), Chongqing, China Apr. 28-30, 2023

- Senior Advisor, IEEE Canada, International Humanitarian Technology Conference (IHTC) 2022, Canada
- Judge, 2021 Engineering Project of the Year and Research Project of the Year Awards Professional Engineers Ontario, April 2022
- International TPC Member, 6th International Conference on Computer Graphics and Digital Image Processing organized by Asia Pacific Institute of Science and Engineering (APISE), Shanghai, China July 8 to 10, 2022 <https://www.cgdi.org/>
- International Advisory Committee and TPC Member, International Conference on Trends in Sustainable Machine Learning Intelligence (ICTSM 2022), Nehru Institute of Technology on 15-16, July 2022 <http://www.ictsmt.com/2022>
- International Advisory Committee and TPC Member, International Conference on Sustainable Computing and Data Communication Systems (ICSCDS 2022), 7-9, April 2022 at Erode, Tamil Nadu, India <http://icscds.com/>
- Program Committee Member, 6th International Conference on Computer, Communication and Signal Processing, February 24 - 25, 2022, IFIP Event Number: 04594, Department of Information Technology, SSN College of Engineering, Rajiv Gandhi Salai, Kalavakkam - 603 110, Chennai, Tamilnadu, India, <https://www.icccsp.com/>
- *IEEE Canada Region 7 Vitality Coordinator, 2021 - 2024*
- Member, IEEE Admission and Advancement Committee, Senior Membership Review Panel, 2021
- TPC and International Advisory Committee Member, International Conference on Artificial Intelligence and Smart Systems (ICAIS 2022) 23-25, February 2022 at Coimbatore, India. <http://icaise.in/2022/index.html>
- Member of International Advisory Committee, International Conference on Innovations in Power and Advanced Computing Technologies, i-PACT-2021, 27 - 29 November 2021 technically sponsored by IEEE PES Malaysian Chapter, Organized by VIT, Vellore and University of Malaya
- TPC Member, ICC2020, 2021, GLOBECOM 2020, 2021, WCNC 2021
- TPC and Advisory Committee Member, 5th International Conference on Electronics, Communication and Aerospace Technology (ICECA 2021) on 2-4, December 2021 organized by RVS Technical Campus, Coimbatore
- Member of International Advisory Committee, International Conference on Cyber Security and Digital Forensics (ICCSDf2020) to be held in The NorthCap University, India, April 2021
- Member of International Advisory Committee, "Artificial Intelligence for Smart Community" 17-18 December 2020, organized by Centre for Graduate Studies (CGS), Universiti Teknologi PETRONAS (UTP) Malaysia and Department of Biomedical Engineering, Dr. NGP Institute of Technology (Dr. NGP IT) India (<https://uevent.utp.edu.my/ivc-aisc2020/>)
- Member, IEEE P1900 – DySPAN – IEEE SC Study Group on Machine Learning for Dynamic Spectrum Access and Sharing
- Member, IEEE TCPS Awards Committee, 2018 - 2020 <http://www.ieee-cps.org/award.html>
- External reviewer for many funding proposals such as NSERC CRD, NSERC SPG, OCE VIP I and II and MITACS Accelerate.
- Program Evaluation Visitor, Honors Bachelor of Information Technology (Computer and Communication Networks), Centennial College, Toronto, Canada, Under the terms of the Post-secondary Education Choice and Excellence Act, March 2019
- Program and Review Committee Member, International Conference on Intelligent Systems, Department of Computer Science and Engineering @ SCSVMV Deemed University, Kanchipuram, Tamil Nadu, India, 12th and 13th July 2018 (<https://conferencealerts.com/show-event?id=199372>)
- Guest Editor (conference proceedings) and Steering Committee member of International Conference on Intelligent Data Communication Technologies and Internet of Things, ICICI 2018 <http://icoici.org/Committee.html> This conference proceedings is published by Springer.
- Advisory committee & Technical Program Committee (TPC) Member, International Conference on Communication, Security, Optimization and Decision Support Systems, under MulticonW-2018 on 23 & 24th February 2018, Mumbai, India

- Technical Advisory Committee Member and Reviewer, Fourth Prathyusha International Conference on "Advances in Electrical, Electronics, Information, Communication and Bio-Informatics-AEEICB'18, 27-28, Chennai, India, February 2018
- Advisory Committee Member, 9th IEEE International Conference on Advanced Computing (ICoAC 2017) Department of Computer Technology, Anna University, Chennai, 14-16 December 2017
- Advisory Committee Member, IEEE International Conference on Cutting Edge Technologies in Computing & Communication, ICCETCC' 18, Jan 10-11, 2018, India
- Advisory Committee Member, IEEE International Conference on Computing Methodologies and Communication, ICCMC 2018, February 2018, <http://icocmc.com/> India
- TPC Member, ICC 2018, VTC Spring 2018 and GLOBECOM 2018, IEEE 1st 5G WORLD, GHTC2017, FORUM 2018 (<http://ieee-ims.org/content/ieee-5g-world-forum-2018-wf-5g>)
- Judge, Ernest C. Manning Innovation Awards, www.manningawards.ca
- TPC Member, ISDDC 2017 International Conference on Intelligent, Secure and Dependable Systems in Distributed and Cloud Environments, October 26-28, 2017, Vancouver, BC, Canada
- Advisory Committee Member, Fifth International Symposium on Security in Computing and Communications (SSCC-2017), September 13-16, 2017, Manipal, India
- International advisory committee member, Second International conference on "Power Electronics and Renewable Energy Systems "ICPERES 2017", December 2017, Chennai, India.
- Program Committee Member, 15th International Conference on Information Technology, December 22-24, 2016, Bhubaneswar, India. <http://www.oits-icit.org>
- Program Committee Member, IEEE International Symposium on Nanoelectronic and Information Systems, Gwalior, India <http://www.ieee-inis.org/>
- Advisory Committee Member, International Conference on Computing and Communication Technologies (ICCCT 2017) on 27th Jan. 2017 to 28th Jan. 2017, India.
- TPC Member, International Conference on Communications (ICC), Mobile Wireless Networks Track, 2017
- Judging panel member, Larry K. Wilson Student Activities Award, and the IEEE Regional Exemplary Student Branch Award, 2016
- Advisory/Technical Program Committee Member, International Conference on Signal Processing, Communication and Networking (ICSCN 2017), April 6-7, 2017, Chennai India
- Technical Program Chair, Special Session on 'Li-Fi (Light –Fidelity) - Can it be the Enabling Technology for Internet of Things?' part of 21st IEEE International Workshop on Computer Aided Modelling and Design of Communication Links and Networks (IEEE CAMAD 2016), 23-25 October 2016, Ryerson University, Toronto, ON, Canada
- Program Chair, International conference on Computational Intelligence in communication, on 1st and 2nd, December 2016, Pondicherry Engineering College, Puducherry, India
- Panel of judges, IEEE MGA Larry K. Wilson Student Activities Award, 2016
- TPC Member, IEEE Symposium on Signal and Information Processing for Smart Grid Infrastructures (IEEE GlobalSIP'16), Greater Washington DC December 7-9, 2016
- Panel of Judges, IEEE Regional Exemplary Student Branch Award, 2016
- Technical Program/Steering Committee member, International Conference on Signal Image Processing Communication & Automation (ICSIPCA 2016), JSS Academy of Technical Education, Bengaluru, India, December 8-10, 2016.
- TPC Member, GLOBECOM, Access Network and Green Communication Tracks 2016
- Advisory Committee Member, National Conference on Intelligent Systems and Communication (NCISC-2016), 23rd & 24th June 2016 Department of Computer Science & Engineering, Anna University, Chennai, India (www.ncisc2016.com)
- TPC Member, GLOBECOM 2016, Mobile Wireless Networks track
- Advisory Committee Member, International Conference on Research Advances in Communication, Computation, Electrical Science and Structures, Salem, March 2016
- **Chair**, IEEE Canada Central Area 2015-16
- Expert Reviewer, Canada-Israel Energy S&T Fund project/ Autonomous off-grid/micro-grid energy management system, 2015

- International Advisory Committee Member, 3rd International Conference on Electrical Engineering and Information & Communication Technology (ICEEICT-2016) organized by Military Institute of Science and Technology (MIST) jointly with the Institute of Information Technology (IIT), Jahangirnagar University, Dhaka, Bangladesh, September 22-24, 2016
- Awards Committee Chair, CCECE 2015, Halifax, Nova Scotia, May 2015
- Advisor and Technical Program Committee Member, International Conference on Science Engineering and Management Research (ICSEMR 2014), November 2014, Chennai, India
- Member of a Distinguished Expert Advisory Board, Tech4i2, Leicester Innovation Centre, Leicester, UK for their proposal for Wireless Spectrum Study to the European Commission
- International Evaluator, Qatar National Research Fund, Qatar
- International Advisory Committee Member, First International Conference on Electrical Engineering and Information & Communication Technology, 10 - 12 April 2014, Dhaka, Bangladesh
- International Advisory Committee Member, International Conference on "Recent Trends Information Technology" ICRTIT-2014, April 10, 2014, to April 12, 2014. MIT, Anna University, India
- Steering Committee Chair, 2013 International Symposium on Instrumentation and Measurement, Sensor Network and Automation, December 23-24, Toronto, Canada
- Steering Committee Member, ICACCI-2012 (International Conference on Advances in Computing, Communications, and Informatics), Chennai, and ICACCI-2013 Mysore, India
- International Expert Reviewer, "Intelligent Management Architecture for Smart Grid: Security and Load Balance" research proposal for \$940,000 submitted to Qatar National Research Fund, 2013
- Member, IEEE COMSOC Education Board, Working Group in Wireless Communications
- **Chair** (2012-2013) and Vice Chair (2010-11), IEEE Toronto Section (<http://toronto.ieee.ca>), Toronto is the largest IEEE Section in the world in terms of Chapters and affinity groups.
- Certified Program Evaluator, [ABET \(Accreditation Board for Engineering and Technology\)](#), USA (visiting US Universities for program accreditation)
- Member, IEEE Canada Board of Directors, 2012-13
- *Chair* (2006 - 2012) and Vice Chair (2003-05), IEEE Communications Society, Toronto Chapter
- *Editorial board member and Co-Author*, "IEEE COMSOC Wireless Engineering Body of Knowledge", this book serves as the text for the worldwide Wireless Communication Engineering Technologies (WCET) certification program <http://www.ieee-wcet.org/>
- *Examiner*, Professional Engineers Ontario, Academic Requirements Committee, 2012
- *International Advisory Committee Member* for International Conference on Computing, Communication and Network (ICCCN 2013), Chennai Institute of Technology and IEEE & Computer Society of India, 15th - 17th March 2013.
- *International Advisory Committee Member*, International conference on Telecommunications and computing, ICTC-2013, December 19-20, 2013, at Nagpur with IEEE Bombay section
- *Reviewer* for many NSERC Discovery, Strategic and CRD grant proposals.

Service to the Toronto Metropolitan University

- Member, [Ryerson Board of Governors](#), 2009-2011, member of the *Finance Committee* and involved in various key decision makings that concern the University
- Program Advisory Council Member, Disaster Studies Professional Master's Program conducted by Faculty of Engineering & Architectural Science (FEAS), Faculty of Science (FoS) & The G. Raymond Chang School of Continuing Education, 2012
- Member of the Curriculum Committee (CC) and Program Advisory Committee (PAC) (together called the "steering committee") for the proposed Certificate program in "Data Analytics, Big Data and Predictive Analytics", Chang School of Continuing Education, Ryerson University, 2013

- Program Advisory Council Member, Professional Masters Diploma Program in Enterprise Information Security, Privacy and Data Protection, Chang School of Continuing Education, Ryerson University, 2013

Service to the Faculty of Engineering, TMU

- Equity Advocate and member, Faculty Promotion Committee, FEAS, 2023-25.
- Member, Search Committee for the Associate Dean for Research and External Partnerships, FEAS, 2021
- *Member*, Search Committee for the Dean, FEAS, 2013-14
- *Member and Chair*, Number of Faculty Promotion Committees, 2005-13
- *Member*, Search Committee for the Associate Dean, 2010
- *Member*, Search Committee for the Associate Dean, 2021

Service to the Department of Electrical and Computer Engineering, TMU

- Member, Grad Admissions and Studies Committee, 2023-24, 2024-25
- Member, Department Hiring Committee, 2020-21
- Member, Scholarships Committee, 2017-18, 2018-19, 2019-20
- Member, Departmental Evaluation Committee (DEC), 2017-18
- Chair, Graduate Studies and Research Council, 2016-17
- *Chair*, Department Appointment Committee (DAC), 2008-09; 2011-12; DAC member few times
- *Chair*, Departmental Awards Committee, 2003-2009
- *Coordinator*, Engineering Design Projects, 2011-12, 2020-2021, 2023
- *Coordinator*, Multimedia Stream, 2009-2012
- *Coordinator*, Signal Processing and Communications Graduate Stream, 2004-2007

Service to the Community

- Founding President, Asian Institute of Technology (AIT) Alumni Association, Canada, 2017-18
- Vice President, University of Peradeniya Alumni Association, Greater Toronto, Canada, 2023-25
- Executive Committee Member, Association of Sri Lanka Graduates of Canada, 2006
- Member, Knights of Columbus, Mississauga, 2012-2020
- President, Sri Lanka Students Association, Asian Institute of Technology, 1994
- Chairperson, Students Association, Asian Institute of Technology, 1994
- Lecture series, Science and Technology for The Community, several lectures in Tamil Vision Television Channel, during 2004-2005

Publications

Books Authored

- B1. Xavier Fernando, 'Radio over Fiber for Wireless Access – From Fundamentals to Advanced Topics', <http://ca.wiley.com/WileyCDA/WileyTitle/productCd-111879706X.html>, 275 pages, available for purchase, 2014.
- B2. Xavier Fernando, Ajmery Sultana, Sattar, Hussain and Lian Zhao, '[Cooperative Spectrum Sensing and Resource Allocation Strategies in Cognitive Radio Networks](#)', Springer 2017
- B3. Xavier Fernando and Hasan Farahneh, '[Visible Light Communications](#): Vehicular Applications' IOP Publications, **2nd Edition**, ISSN 978-0-7503-6049-4, <https://dx.doi.org/10.1088/978-0-7503-6049-4>

Book Chapters

- CH13. Xavier Fernando, George Lăzăroiu, and Katarina Valaskova 'Digital Twin-Based Generative Artificial Intelligence of Things for 6G Wireless Sensor Networks' Modern Wireless Communication Systems and Networks Design, Practice, and Implementation Edited by Budhaditya Bhattacharyya, Anindita Kundu, Anantha Krishna Chintanpalli and Xavier Fernando, CRC Press 2026
- CH12. Xavier Fernando and George Lăzăroiu 'Sensor network, blockchain, and digital twin as the backbones of a connected ecosystem of smart schools' in Elsevier book Digital Twins in the Smart Classroom, 2026.
- CH12. Noha Hassan and Xavier Fernando, "'Cybersecurity of Connected and Autonomous Vehicles (AVs)", to appear in the Elsevier book Cybersecurity of Power Electronics Systems, edited by Dr. Muhammad H. Rashid, Life Fellow IEEE, 2026.
- CH11. Xavier Fernando and Lăzăroiu, G " Digital twin-based generative artificial intelligence of things for 6G wireless sensor networks" edited volume "Wireless Communication and Networks: Design, Practice, and Implementation", CRC Press (Taylor & Francis Group)
- CH10. Maheswari, S., Marimuthu, C. N., & Fernando, X. N. (2025). A Robust Automated Cervical Cancer Detection System Using Elephant Herding Optimized MCNN. In A. Ajibesin, N. G., & S. Thangavel (Eds.), *Synergizing Data Envelopment Analysis and Machine Learning for Performance Optimization in Healthcare* (pp. 213-234). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-0081-8.ch009>
- CH9. Lăzăroiu, G., Fernando, X., Mihăilă, R. (2025). Ecological Civilization Construction and Sustainable Development: Urban Green Technology Innovation, Environmental Value Assessment, and Net-Zero Carbon Neutrality. In: Peters, M.A., Green, B.J., Misiaszek, G.W., Zhu, X. (eds) *Handbook of Ecological Civilization*. Springer International Handbooks of Education. Springer, Singapore. https://doi.org/10.1007/978-981-97-8101-0_17-1
- CH8. Noha Hassan* and Xavier Fernando, 'User Association Performance Tradeoffs in Integrated Terahertz/mmWave/RF Networks' part of the book Journey into Terahertz Radiation - Exploring the Invisible Frontier, IntechOpen, 2024
- CH7. Xavier Fernando and George Lazaroiu*, 'Medical sensor network, blockchain and digital twin as the backbones of a connected ecosystem of smart hospitals' part of the Elsevier book: "Sensors Networks for Smart Hospitals - ISBN: 9780443247903, pages: 109-128, Edited by Tuan Anh Nguyen, 2025
- CH6. S. Geetha, J. Madhusudanan, V. Prasanna Venkatesan and Xavier Fernando. (2023). Design of a Smart Health Care Environment with Digital Twinning and Machine Learning. Digital Twin Technology and its applications, pages 1-21, Submitted, CRC press.
- CH5. V. Vaidehi, Ravi Pathak, Renta Chintala Bhargavi, Kirupa Ganapathy, C. Sweetlin Hemalatha, A. Annis Fathima, P. T. V. Bhuvaneswari, Sibi Chakkaravarthy S. and Xavier Fernando, 'Enhanced Complex Event Processing Framework for Geriatric Remote Healthcare' in 'Handbook of Research on Investigations in Artificial Life Research and Development', Maki Habib (The American University in Cairo) 2018, ISBN13: 9781522553960 | ISBN10: 1522553967 | EISBN13: 9781522553977, DOI: 10.4018/978-1-5225-5396-0

- CH4. S. M. Kamruzzaman, Xavier Fernando, Muhammad Jaseemuddin, and Wisam Farjow, 'Reliable Communication Network for Emergency Response and Disaster Management in Underground Mines' part of the book "Smart Technologies for Emergency Response and Disaster Management" Zhi Liu (Waseda University, Japan) and Kaoru Ota (Muroran Institute of Technology, Japan), 2018, ISBN13: 9781522525752 | ISBN10: 1522525750 | EISBN13: 9781522525769, DOI: 10.4018/978-1-5225-2575-2
- CH3. Xavier Fernando, 'Electric Vehicles – The Mobile Portion of the Smart Grid', Chapter of the book 'Smart Grid: Networking, Data Management and Business Models' CRC Press, <https://doi.org/10.1201/b19664> Edited by: Prof. Hussain Mouftah and Dr. Melike Erol-Kantarci, 2017
- CH2. Ala Khalifeh, Hasan Farahneh, Christopher Mekhiel and Xavier Fernando, 'Visible Light Communications: Numerous Applications' part of the book Advanced Methodologies and Technologies in Engineering and Environmental Science, IGI Global E-Editorial Discovery System, Pages 425-437, DOI: 10.4018/978-1-5225-2255-3.ch578, 2018
- CH1. X. Fernando and, N. Pavlidou, 'Fundamental Knowledge' Part of the book A Guide to the Wireless Engineering Body of Knowledge", ISBN: 978-0-470-4336-9, 2009, this book serves as the text for the worldwide wireless certification program by IEEE COMSOC, (WCET) <http://www.ieee-wcet.org/>

Technical Reports

- [T1] Rahul Razdan, Raivo Sell, Avinash Balachandran, David Zuby and Xavier Fernando 'Unsettled Technology Areas in Autonomous Vehicle Test and Validation' June 12, 2019, SAE Mobilus, EPR2019001, DOI: <https://doi.org/10.4271/EPR2019001>, Pages: 33, ISSN: 2640-3536, e-ISSN: 2640-3544

Patents and Non-Disclosure Agreements

- P11. United States, Provisional Patent Application 'Self Sustainable Cognitive Wireless Sensor Networks with RF Energy Harvesting' Xavier Navajothy Fernando and Arif Obaid, filed May 2021
- P10. United States [Worldwide Patent #11914856](#); Application# 17144857, 'Wireless positioning systems' Inventors, Peyman Moeini, Akbar Ahmari, Furat Al-obaidy, Arghavan Asad, Dishan Fernando, Xavier Navajothy Fernando, Sammy Guergachi, Muhammad Jaseemuddin, Xiaofeng Li, Ryan Murari, Farah Mohammadi
- P9. United States, Provisional Patent Application No. 62/958,475, Inventors: (1) MOEINI, Peyman; (2) LI, Xiaofeng; (3) FERNANDO, Xavier; and (4) JASEEMUDDIN, M, Title: A Mac Layer Protocol for Smart Indoor Inventory Management System, Filed: January 8, 2020
- P8. United States, Provisional Patent Application No. 62/971,732, Inventors: (1) MOEINI, Peyman; (2) MURARI, Ryan; (3) FERNANDO, Xavier Navajothy; and (4) JASEEMUDDIN, Muhammad, Title: Practical and Robust Approach for a Neural Networks Based Indoor Positioning System Using Ultrawide Band, Filed: February 7, 2020
- P7. Xavier Fernando, Jennifer MacInnis (Ryerson) and Shawn Zhou (Nautic Devices Inc), 'Range Extension of Wireless Handheld Devices', NDA signed June 2016
- P6. Peyman Moeini, Xavier Fernando and Ik Pyo Hong, 'System and Method for Real-Time Asset Localization' US patent filed November 12, 2016, #14/939,191
- P5. Wisam Farjow and Xavier Fernando, 'System and Method to Control Amplifier Gain in a Radiating Line Communication System' **Canadian Patent**, serial number 2789768, Ref # P45412, filing date of September 14, 2019
- P4. Xavier Fernando and Abu B. Sesay, 'An Optical Fiber-Based Wireless Scheme for Wideband Multimedia Access', **United States patent** (20030078074), 2003
- P3: Xavier Fernando and Way Leong, 'Smart Environment Sensing and Controlling System (SESAC)' Non-Disclosure Agreement signed in 2006
- P2. Xavier Fernando and W. Xing, 'Radio over Fiber based Gigabit Wireless Access to High-Speed Trains in China' NDA signed March 2008, Inst of Advanced Telecommunications, UK
- P1. Xavier Fernando and Hassan Kojori, 'Remote Gate Control in Aircrafts' NDA 2009, Honeywell Inc.

Invited Papers

- IP9. Xavier Fernando 'Addressing the Challenges of V2X VLC Communications' SPIE Photonic North, Niagara Falls, May 28, 2020

- IP8. Peter He, Lian Zhao, Xavier Fernando, 'Transmission Time Minimization of an Energy Harvesting Cognitive Radio System' IEEE Symposium on Signal and Information Processing for Smart Grid Infrastructures, IEEE GlobalSIP'16, Greater Washington DC, December 7-9, 2016
- IP7. Sattar Hussain and Xavier Fernando, 'A Novel Strategy for Cognitive Radio Networks with Diversity and Non-Identical Fading Channels', 2013 International Symposium on Performance Evaluation of Computer and Telecommunication Systems, July 7-10, 2013, Toronto, Canada
- IP6. Xavier Fernando and K. Thambu, 'Cross-Layer Coding Improves Quality and Security in Wireless Video Sensor Networks' International Conference on Security of Internet of Things (SecurIT 2012) August 17 – 19, 2012 at Amrita University in Kerala, India, Paper ID 121, <http://dl.acm.org/citation.cfm?id=2490441&CFID=221131469&CFTOKEN=83555475>, sponsored by ACM/SIGSAC
- IP5. Amir Sepasi Zahmati and Xavier Fernando, 'A New Perspective on Spectrum Sensing for Cognitive Sensor Networks' Proc. of the International Conference on Recent Trends in Information Technology, 18-20 April 2012, Chennai, India
- IP4. Xavier N. Fernando, Sajjadul Latif and Vaidehi Vijayakumr, 'Information and Communication Technologies for a Greener World' Proceedings of the Third International Conference on Advanced Computing, 14-16 December 2011, Chennai, India <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6165232&isnumber=6165149>
- IP3. Umasankar, B. and Fernando, X., 'OFDM Impairment Mitigation Techniques' invited paper, Second International Conference on Access Networks & Workshops, pp: 622-24, Aug. 2007
- IP2. Roland Yuen and Xavier Fernando, 'Multimedia Hotspots Supporting Wireless LAN and Cellular CDMA Access' invited paper, International Conference on Industrial and Information Systems (ICIIS 2006); Sri Lanka, August 2006
- IP1. Xavier Fernando, 'Radio over Fiber in Multimedia Access Networks' invited paper, International Conference on Access Networks (<http://www.accessnets.org>), Athens, Greece, September 2006 (NSERC)

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- [J92] S. A. Ali Shah, X. Fernando and R. Kashef, Energy-Efficient UAV-Enabled Cell-Free mMIMO Mobile Edge Computing with Mixture-of-Experts" IEEE Communications Letters (submitted)
- [J91] S. A. Ali Shah, X. Fernando and R. Kashef, Retrieval-Augmented Generation for Resource Management via Mixture of Experts, Large Language Model and Reinforcement Learning For CF-mMIMO Systems" IEEE Transactions on Wireless Communications (submitted)
- [J90] Kyunghwa Chae, Anitha Saravana Kumar, and Xavier Fernando, FLOLA: Federated Learning with Ontology-based Label Alignment for Cross-Country Traffic Sign Recognition, under review, IEEE Transactions on Intelligent Transportation Systems (IEEE T-ITS), 2026
- [J89] Noha Hassan and Xavier Fernando, Time Sufficiency: A Real-World Field Study of the Tampa THEA Connected Vehicle Pilot, under review in IEEE Transactions on Intelligent Vehicles, 2025
- [J88] Amin Mohajer and Xavier Fernando, Joint SLA-Aware Task Offloading and Adaptive Service Orchestration with Graph-Attentive Multi-Agent Reinforcement Learning' in press, IEEE Transactions on Network and Service Management, 2026. <https://doi.org/10.1109/TNSM.2026.3673188>
- [J87] Syed Ammad Ali Shah, Rasha Kashef and X. Fernando 'Joint Optimization of UAV Trajectory, Transmit Power and User Association in Aerial-Terrestrial Cell-Free Massive MIMO Network' in press, IEEE Transactions on Wireless Communications, 2025
- [J86] Lazaroiu, G., Gedeon, T., Fernando, X., Herciu, M., Grecu, G., Chiru, C., Grecu, I., Pârvu, I., & Guni, C., The algorithmic management of job loss and creation in the enterprise generative, multimodal, and agentic artificial intelligence economy, *Oeconomia Copernicana*, 16(4), 1491-1524. <https://doi.org/10.24136/oc.3994>, 2025
- [J85] Atefeh Hajjiamali Arani, Xavier Fernando, Omar Alhussein, and Yeying Zhu, Deep Reinforcement Learning for Resource Sharing and UAV Trajectory Optimization in Multi-Operator UAV-Assisted Wireless Networks, *IEEE Transactions on Vehicular Networks*, 2026
- [J84] Vigneswararajah V, Thavarajah N, Fernando X. Synthesis of Pectin Hydrogels from Grapefruit Peel for the Adsorption of Heavy Metals from Water. *Technologies*. 2025; 13(9):403. <https://doi.org/10.3390/technologies13090403>
- [J83] Lalchand P, Thavarajah N, Fernando X. Sodium Alginate-Pomegranate Peel Hydrogels for the Remediation of Heavy Metals from Water. *Technologies*. 2025; 13(8):351. <https://doi.org/10.3390/technologies13080351>
- [J82] Enaya A, Fernando X, Kashef R. Survey of Blockchain-Based Applications for IoT. *Applied Sciences*. 2025; 15(8):4562. <https://doi.org/10.3390/app15084562>

- [J81] Farahneh H, Rahhal JS, Abualnadi DI, Mansour I, Atieh AK, Fernando X. An Experimental Study of Radiated Energy from an Optical Fiber and the Potential for an Optical MIMO System. *Applied Sciences*. 2025; 15(6):2916. <https://doi.org/10.3390/app15062916>
- [J80] Danuta Szpilko, Xavier Fernando, Elvira Nica, Klaudia Budna, Agnieszka Rzepka and George Lăzăroiu, 'Energy in Smart Cities: Technological Trends and Prospects' *Energies* 2024, 17, 6439, <https://doi.org/10.3390/en17246439>
- [J79] Gupta A, Fernando X. Latency Analysis of UAV-Assisted Vehicular Communications Using Personalized Federated Learning with Attention Mechanism. *Drones*. 2025; 9(7):497. <https://doi.org/10.3390/drones9070497>
- [J78] Gupta, Abhishek, and Xavier N. Fernando. 2024. "Latency Analysis of Drone-Assisted C-V2X Communications for Basic Safety and Co-Operative Perception Messages" *Drones* 8, no. 10: 600. <https://doi.org/10.3390/drones8100600>
- [J77] Gupta, Abhishek, and Xavier Fernando. 2024. "Federated Reinforcement Learning for Collaborative Intelligence in UAV-Assisted C-V2X Communications" *Drones* 8, no. 7: 321. <https://doi.org/10.3390/drones8070321>
- [J76] Fernando, Xavier, and Abhishek Gupta. 2024. "Analysis of Unmanned Aerial Vehicle-Assisted Cellular Vehicle-to-Everything Communication Using Markovian Game in a Federated Learning Environment" *Drones* 8, no. 6: 238. <https://doi.org/10.3390/drones8060238>
- [J75] Fernando X, Gupta A. UAV Trajectory Control and Power Optimization for Low-Latency C-V2X Communications in a Federated Learning Environment. *Sensors*. 2024; 24(24):8186. <https://doi.org/10.3390/s24248186>
- [J74] Hassan, Noha, Xavier Fernando, and Isaac Woungang. 2024. "An Emergency Message Routing Protocol for Improved Congestion Management in Hybrid RF/VLC VANETs" *Telecom* 5, no. 1: 21-47. <https://doi.org/10.3390/telecom5010002>
- [J73] Wang, Z.; Thavarajah, N.; Fernando, X. Exploring Silica Nanoparticles: A Sustainable Solution for Pest Control in Sri Lankan Rice Farming. *Preprints* 2024, 2024091712. <https://doi.org/10.20944/preprints202409.1712.v1>
- [J72] Xavier N Fernando, and George Lazaroiu *, 'Energy-efficient Industrial Internet of Things in Green 6G Networks' *Applied Sciences*, Manuscript ID: applsci-3053234, 2024.
- [J71] Amudhavalli, P.; Zahira, R.; Umashankar, S.; Fernando, X.N. A Smart Approach to Electric Vehicle Optimization via IoT-Enabled Recommender Systems. *Technologies* 2024, 12, 137. <https://doi.org/10.3390/technologies12080137>
- [J70] Md. Nooruzzaman and Xavier Fernando, 'Hybrid Multicore Datacenter Networks with Extreme Scalability and Deterministic Queuing Points' *Journal of Optical Communications and Networking*, 2024
- [J69] Md. Nooruzzaman and Xavier Fernando, 'Cost dynamics of converged optical-wireless networks: enabling low-latency xRANs through a reconfigurable hybrid split' *Journal of Optical Communications and Networking*, 16, 659-669, 2024. <https://opg.optica.org/jocn/abstract.cfm?uri=jocn-16-6-659>
- [J68] Ali Shah, Syed Ammad, Xavier Fernando, and Rasha Kashaf. 2024. "A Survey on Artificial-Intelligence-Based Internet of Vehicles Utilizing Unmanned Aerial Vehicles" *Drones* 8, no. 8: 353. <https://doi.org/10.3390/drones8080353>
- [J65] Xavier N Fernando *, Kandasamy Illanko, Moiz Hassan, 'Single Image Super Resolution using Deep Residual Learning' *Artificial Intelligence (AI), Special Issue on Artificial Intelligence-Based Image Processing and Computer Vision*, 2024, AI 5, no. 1: 426-445. <https://doi.org/10.3390/ai5010021>
- [J64] Anitha S. Kumar, Lian Zhao and Xavier Fernando, 'Task Offloading and Resource Allocation in Vehicular Networks: Asynchronous Federated Deep Reinforcement Learning Approach' *IEEE Transactions on Vehicular Technology*, 2024
- [J63] Noha Hassan*, Xavier Fernando, Isaac Woungang and Alagan Anpalagan. (2023). User Association Performance Trade-offs in Integrated RF/mmWave/THz Communications. *Future Internet*, <https://doi.org/10.3390/fi15120376> (WoS ESCI, Scopus, Cite Score 6.7, IF=3.4).
- [J62] Satyanand Singh*, Joanna Rosak-Szyrocka, Drotár István*, and Xavier Fernando. (2023). Oceania's 5G Multi-Tier Fixed Wireless Access Link's Long-Term Resilience and Feasibility Analysis. *Future Internet* (WoS ESCI, Scopus, Cite Score 6.7, IF=3.4).
- [J61] Xavier N Fernando and, George Lazaroiu, 'Spectrum Sensing, Clustering Algorithms, and Energy Harvesting Technology for Cognitive Radio-based Internet of Things Networks' *Sensors*, Special Issue "Spectrum Sensing for Wireless Communication Systems", *Sensors* 2023, no. 18: 7792. <https://doi.org/10.3390/s23187792> Impact Factor 3.9, Cite Score 6.8
- [J60] Anitha S. Kumar, Lian Zhao and Xavier Fernando, 'Task Offloading and Resource Allocation in Vehicular Networks: A Lyapunov-based Deep Reinforcement Learning Approach' *IEEE Transactions*

- on Vehicular Technology, Oct. 2023, Vol. 72, Issue: 10, Page(s): 13360-13373, ISSN: 1939-9359, DOI 10.1109/TVT.2023.3271613
- [J59] Kandasamy Pirapaharan, W. H. Sasinda, C. Prabhashana, S. P. Pramuka Medaranga, Paul R. P. Hoole and Xavier Fernando 'A New Generation of Fast and Low-Memory Smart Digital/Geometrical Beamforming MIMO Antenna' Electronics 2023, 12, no. 7: 1733, pp: 1-15, <https://doi.org/10.3390/electronics12071733>
- [J58] K. Pirapaharan, N. Ajithkumar, K. Sarujan, Xavier Fernando and Paul R. P. Hoole, 'Smart, Fast, and Low Memory Beam-Steering Antenna Configurations for 5G and Future Wireless Systems' Electronics 2022, Special Issue on "Numerical Electromagnetic Problems Involving Antennas" 1(17), 2658; <https://doi.org/10.3390/electronics11172658> <https://www.mdpi.com/2079-9292/11/17/2658>
- [J57] Ajmery Sultana* and Xavier Fernando, 'Intelligent Reflecting Surface aided Device-to-Device Communication: A Deep Reinforcement Learning Approach' MDPI Future Internet Journal, Special Issue: AI, Machine Learning and Data Analytics for Wireless Communications, 29 August 2022, 14(9), 256; <https://doi.org/10.3390/fi14090256>
- [J56] Abhishek Gupta and Xavier Fernando, Simultaneous Localization and Mapping (SLAM) and Data Fusion in Unmanned Aerial Vehicles: Recent Advances and Challenges', MDPI Drones 2022, 6(4), 85; <https://doi.org/10.3390/drones6040085>, Open Access at <https://www.mdpi.com/1562540>
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- [J47] Hasan Farahneh and, Xavier Fernando 'The Leaky Feeder, a Reliable Medium for Vehicle to Infrastructure Communications' MDPI journal on Transport Systems and Infrastructures, Appl. Syst. Innov. 2019, 2(4), 36; <https://doi.org/10.3390/asi2040036> - 08 Nov 2019
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