

Curriculum Vitae

Dr Winston Khoon Guan SEAH
Professor of Network Engineering

School of Engineering and Computer Science
Faculty of Engineering
Victoria University of Wellington
PO Box 600, Wellington 6140
New Zealand
Email: Winston.Seah@ecs.vuw.ac.nz
URL : <https://people.vgtn.ac.nz/Winston.Seah>



Career Objectives

To learn, to discover, to invent and to share knowledge – and I hope to achieve this by balancing the following mutually supporting activities:

- To lead and conduct challenging research in the area of info-communications and networking with the aim of taking research from theoretical ideas to real systems that benefit mankind. I enjoy identifying new areas of research and leading teams of dedicated researchers in solving challenging research problems, including developing these ideas into proof-of-concept prototypes that can be turned into commercially viable products.
- To share my ideas and knowledge through teaching at the tertiary level, and through that instill in students, the passion to learn and do research. Teaching also compels me to continuously learn new things. As the saying goes, "the more you know, the more you realize how little you know" and therefore inspires me to learn more. However, the value of knowledge lies in sharing it and this is what I hope to do through teaching.

Current Positions

1. Professor of Network Engineering, School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand
2. Leader, Wireless Networks Research Group, ECS
3. Professional Member of ACM
4. Fellow, European Alliance for Innovation (EAI)

Education

Dr.Eng. in Applied Systems Science, Kyoto University, Kyoto, Japan, 1997.

M.Eng. in Electrical Engineering, National University of Singapore, 1993.

B.Sc. in Computer and Information Sciences, National University of Singapore, 1987.

Scholarships, Fellowships and Awards

- James Cook Research Fellowship, 2022, one in only three awarded in New Zealand, for research in quantum networking protocols and algorithms.
- Best Paper Award, 42nd IEEE Conference on Local Computer Networks (LCN), Oct 9-12, 2017, Singapore. (cf: Selected Publications [15])
- Best Paper Award, 45th Hawaii International Conference on System Sciences, Jan 4-7, 2012, Maui, Hawaii, USA. (cf: Selected Publications [25])
- JSPS Invitation Fellowship for Research in Japan (short term) 5-23 Dec 2011.
- Highly Commended Paper Award, IEEE 22nd International Conference on Advanced Information Networking and Applications (AINA2008), March 25-28, 2008, GinoWan, Okinawa, Japan. (cf: Selected Publications [31])
- Monbusho Postgraduate Scholarship awarded by the Government of Japan, 1992-1995.
- Postgraduate Research Scholarship, Foundation for C&C Promotion (NEC funded), 1996.
- Postgraduate Research Scholarship, Int'l Communication Foundation (KDD funded), 1996.

Visiting Positions

- Visiting Researcher (客座研究员), 2019-2022, Inner Mongolia University, China.
- Visiting Professor, Jan 1-Jun 30, 2020, Singapore University of Technology and Design, Singapore.
- Visiting Professor, Mar 1-May 31, 2018, National Chiao Tung University, Hsinchu, Taiwan.
- Visiting Professor, Jan 2–24, 2015, School of Electrical and Electronic Engineering, Singapore Polytechnic, Singapore.
- Visiting Researcher, Dec 23, 2014–Jan 21, 2015, School of Electrical and Electronic Engineering, College of Engineering, Nanyang Technological University, Singapore.
- Visiting Professor, Jun 1–Aug 31, 2014, Graduate School of Informatics, Kyoto University, Japan.
- JSPS Invited Fellow, Dec 3-23, 2011, Graduate School of Informatics, Kyoto University, Japan, funded by the Japan Society for the Promotion of Science.
- Visiting professor, Dec 15, 2010–Jan 15, 2011, Department of Computing, The Hong Kong Polytechnic University, Hong Kong.
- Visiting scientist, Sep 3-7, 2007, Department of Telecommunications, Delft University of Technology, The Netherlands.
- Visiting research professor under 21st Century Center of Excellence Program of Japan, March 16-29, 2003, Graduate School of Informatics, Kyoto University, Kyoto, Japan.

Research Interests

Today's Internet needs to support untethered communications, mobility, quality of service, sensing and actuation, user-programmability and, most importantly, sustainability through the use of renewable energy. My research aims to meet those needs from the networking protocols perspective, under the following two broad areas:

1. *Internet of Things (IoT)*

Today's Internet connects not just computer systems but a plethora of systems, devices, and objects, collectively referred to as "Things", and encompasses technologies for identification and tracking, sensing and actuation, both wired and wireless communications, and also, intelligence and cognition. This research theme is supported by grants from various sources, including Huawei NZ, InternetNZ, and Royal Society of New Zealand.

- a. Content and Data Driven Networking (CD2N) aims to route/send packets based on the content rather than the destination address. This is a variant of Named Data Networking and Content Centric Networking but aims to re-design the entire routing fabric specifically for IoT devices.
- b. Traffic classification (TC) using Software Defined Networking (SDN) aims to exploit the logically centralized architecture of SDN to develop novel approaches for realizing TC that is a critical component of providing quality of service in the IoT.
- c. Nano-scale Networks (NanoNets) – Electromagnetic-based Wireless Nano Sensor Networks (EM-WNSNs) operating in the Terahertz band (0.1~10 THz) form the basis of nano-scale applications and expand the scope of the Internet of Things (IoT) to the Internet of Nano Things (IoNT). To date, limited research on data delivery has been done to address the peculiarities of EM-WNSNs from the networking perspective. Our research aims to develop the efficient data delivery mechanism for EM-WNSNs that also account for the backhaul bandwidth capacity from the IoT.
- d. Wireless Sensor Networks Powered by Ambient Energy Harvesting (WSN-HEAP) Wireless sensor networks (WSNs) are set to form a significant part of the IoT. WSNs have traditionally been powered by limited energy sources, viz. batteries, limiting their operational lifetime. To ensure the sustainability of WSNs, researchers have turned to alternative energy sources for power. Harvesting ambient energy from the environment to power WSNs is a promising approach but energy harvesting devices of the same footprint as wireless sensors are unable to provide sufficient energy for sustained operation, presenting new challenges to protocol design.

- e. Exploiting Radio Irregularity for Detection, Monitoring and Tracking (ERI-DMT) Wireless communications, which is an integral part of IoT, suffers from radio irregularity – a phenomenon referring to radio waves being selectively absorbed, reflected or scattered by objects in their paths, e.g., human bodies that comprises liquid, bone and flesh. Radio irregularity is often regarded as a problem in wireless communications but, with the envisioned pervasiveness of IoT, we aim to exploit radio irregularity as a means to detect the presence of people, animals and other objects. Applications for this technology, include motion/intrusion detection for security and surveillance, automated people counting, wildlife detection and tracking for determining absolute abundance or pest control, vehicular traffic monitoring, etc.

2. Wireless Communication Networks in Extreme Environments

The use of wireless communications is swiftly extending beyond networks for the average person to networks for embedded devices, sensors and autonomous systems, as well as networks for personnel in extreme environments—underground, underwater and in disaster situations.

- a. Robust End-to-End Data Delivery Algorithms for Harsh Environments
A typical harsh environment that emerged in recent years is one where the amount of energy available to power wireless devices (viz., sensors) is sporadic and severely limited. This is characteristic of systems that are powered by ambient energy harvesting, especially those for natural hazards and infrastructure monitoring (see next point on WSN-HEAP). I developed simple yet highly efficient protocols for data delivery in such environments, as well as for maintaining full coverage needed in rare event detection.
- b. Another class of harsh environment relates to an abundance of metallic structures, e.g. steel supporting beams, which can adversely affect RF signal propagation. In the process of designing a wireless mesh network for interconnecting vibrating wire strain gauges used in structural monitoring of critical supports in subway excavation sites, I discovered that there is a fundamental flaw in the design of many wireless multihop routing protocols. I designed a scheme that transforms the underlying wireless network topology to suit these existing routing protocols, thus alleviating and possibly eliminating the effects of the design flaw. The resulting algorithm is easily implemented as a software module in low-cost commercial-off-the-shelf network devices, and has been validated in numerous field tests.
- c. Similarly, a harsh environment can also be one where nodes are uncooperative or even malicious. In this context, techniques to quantify the level of fairness/selfishness are developed. Game theoretic methods are applied to analyze performance and protocols designed to ascertain trust and address undesirable node behavior.
- d. Wireless Sensor Networks Powered by Ambient Energy Harvesting (WSN-HEAP) My focus is on designing reliable data delivery protocols for such networks and systems. I also developed a wireless sensor that powers itself from the shaking of the building during an earthquake, which then measures the intensity of stress experienced by the building. The data from a network of such sensors attached to buildings will assist civil and structural engineers in the post-quake structural assessment. I also conceived a land movement monitoring scheme using low cost solar-powered GPS nodes (\$100~\$200) exploiting similarity in wireless channel conditions to achieve relative positioning comparable to the location accuracy of much higher cost (>\$10,000) systems. The system can provide a better understanding of slope deformation and the potential for warning systems that would protect key assets, and I have been given a grant of NZ\$57,288 by the New Zealand Earthquake Commission to further develop the system.

Past research and achievements

1. **Oceanographic wireless ad hoc and sensor networks** for realtime monitoring and surveillance - designed a novel underwater network architecture based on a multipath virtual sink approach and the supporting protocol suite. The multi-disciplinary approach combines wireless communications and robotics, exploiting the controlled mobility of underwater autonomous vehicle teams to enhance the network connectivity in the harsh underwater environment, and thus provide quality of service assurances to the network services and applications. Notable achievements include invited papers, book chapter, a Highly Commendable Paper Award in an international conference (AINA2008), and industry funding (see also next section, item 5.b.).
2. **Mobile ad-hoc networks** (MANETs) with emphasis on quality of service (QoS) support and routing protocols, focusing on mobility-enhanced lightweight protocols and algorithms for command, control & communication (C³) and sensing applications; achievements include:
 - a. I started working on QoS for MANETs in 1998 and developed one of the *first QoS models for mobile ad-hoc networks* (see Selected Publications [40] which has more than 350 citations, as of Oct 2012.) I also gave keynote presentation on the topic “Quality of Service in Mobile Ad Hoc Networks – Myth or Reality?” in Australian Telecommunication Networks and Applications Conference (ATNAC2004), Dec 8-10, 2004, Sydney, Australia.
 - b. In 2002 to 2003, I led the research and developed the CachHing And Multipath routing Protocol (CHAMP) that is able to provide robust data delivery in MANETs through multipath routing and in-network data caching which was presented in INFOCOM 2003 and subsequently published in the IEEE Transactions on Mobile Computing in 2005; to date, the INFOCOM 2003 paper has more than 150 citations. The caching feature has been exploited to support delay-tolerant networking (DTN) and the Singapore Defence Science and Technology Agency (DSTA) provided S\$311,600 funding for a 12-month project (Nov’08-Oct’09) to study the feasibility applying DTN in challenged environments.
3. In 1999 to 2002, I worked on next generation Internet protocols with emphasis on mobility, wireless connectivity, quality of service, security, and authentication, authorization and accounting. Notable contributions include the RSVP-Mobile IPv6 Interworking scheme that was proposed to the IETF and received strong support from the telecommunications industry.

Key Senior/Technical Leadership Roles, Highlights and Success Stories

1. Since Oct 2009, I am Professor of Network Engineering in the School of Engineering and Computer Science, Victoria University of Wellington, New Zealand, where I provide research leadership in Network Engineering and work with the Programme Director on the curriculum of the Network Engineering programme.
2. From Mar 2011 to Mar 2022, I chaired the PhD Admission and Scholarship Committee, ECS, VUW, NZ. I led this committee to assess applications for admission into our PhD programme and identify qualified applicants for the university doctoral scholarship. During my tenure, I implemented various processes that significantly improved the quality of candidates admitted into our PhD programme, which resulted in a much higher percentage of our PhD candidates graduating with honours. The processes also ensured transparency in the evaluation, as well as fairness in the allocation of PhD students to supervisors.
3. Since 2016, as Leader of the Wireless Networks (WiNe) research group, I work with a group of dedicated colleagues and postgraduate students to address challenging research problems in emerging wireless networks and how they come together to form the larger Internet of Things. We deal with fundamental research problems that can lead to successful products and services in the future.

4. Since 2013, I have been leading research in selected areas of Software Defined Networking (SDN) such as traffic classification and the application of queueing theory for performance analysis of SDN/OpenFlow-based networks and systems. I have successfully secured external funding from InternetNZ as well as the New Zealand - Japan Joint Research Programme. Concurrently, I worked with various overseas collaborators to establish the Asia-Pacific Experimental SDN (ASPEN) testbed that links VUW to Whitireia Polytechnic New Zealand, Kyoto University, Japan and Nanyang Technological University, Singapore.
5. From Apr 2005 to Oct 2009, I led a team of research scientists, engineers and PhD students to research and develop wireless ad hoc and sensor network for realtime monitoring and surveillance in terrestrial and underwater environments, focusing on the following two areas:

- a. *Structural Health Monitoring of Buildings and Critical Infrastructures*

Despite the extensive research in wireless sensor networks, there have not been many real applications that exploit the vast research results. It is my goal to conduct research that addresses real needs and the opportunity came about through working with the Singapore Industrial Automation Association.

- After the retaining walls at an underground Mass Rapid Transit station construction site in Singapore collapsed on 20 Apr 2004, resulting in 4 fatalities, the Building and Construction Authority mandated realtime monitoring of critical structures. The current state-of-the-art system in use connects vibrating wire (VW) strain gauges (welded to the supporting beams) to a realtime data acquisition system using cables. The collected data is then transmitted using GPRS every 10 minutes to a remote server for processing and if the readings exceed a pre-defined threshold, the on-site engineers are immediately alerted via SMS.

The cabled system has limited scalability and suffers from various problems, e.g. false alerts caused by interferences from welding and EM sources, cables being accidentally cut by workers, etc. After close consultation with a local SME (Small and Medium Enterprise) that provides the monitoring system, we jointly embarked on a project to develop a wireless mesh network to interconnect all the VW strain gauges.

- In most wireless sensor networks research, it is assumed that the energy supply is limited and the goal is to maximize the lifetime of the energy supply. However, in structural health monitoring of building and critical infrastructures, the lifetime of the sensor network is in the order of decades and furthermore, the energy supply cannot be replaced once deployed. Instead of batteries, we use energy harvesting methods to power the sensors, and this changes the energy source model completely, making most of the existing research unusable. Working with the industry, we adopt an experimental approach, by coupling commercially sold energy harvesters with sensors, and testing our protocols in the field.

- b. *Underwater Wireless Sensor Networks*

In Apr 2005, I set up the underwater networks research group as part of the new research focus in the department, and over two years, achieved significant results in terms of research publications and the development of a new multipath virtual sink architecture for underwater ad hoc and sensor networks. Our publications have become mandatory reading material for other underwater networks research groups in the world.

In Aug 2007, in collaboration with researchers from the National University of Singapore (NUS), we secured funding of \$504K to develop an intelligent deepwater mooring system for offshore oil drilling platforms. Our group is primarily responsible for the underwater sensor network that provides localization and navigation aid to the deepwater mooring vehicles, as well as the wireless multihop delivery of telemetry and sensor data to remote data acquisition systems. For this subtask, we have been allocated S\$71K for equipment.

In early 2008, I secured funding of S\$892K from the Defence Science and Technology Agency of Singapore for a 15-month proof-of-concept project to develop a prototype of the communications architecture for cooperative swarms of underwater unmanned

vehicles (UUV). Another 24-month research project in collaboration with NUS on “Robust Multihop Underwater Network to Support Long-Range Sensing Applications” was also approved in Apr 2009, with funding of S\$280K.

6. Leader, Networks technology group, Siemens Picture of the Future I&C Project 2006.

I led a team of seven senior researchers in a joint effort between A*STAR and Siemens AG to develop the Networks component of Siemens’ “Picture of the Future” (PoF) for ICT in 2006. The PoF shows a clearly structured path to the future, identifying technologies with major growth potential, recognizing technological breakthroughs, and anticipating future customer needs and new business opportunities. Siemens AG conducts this exercise twice a year and publishes the results on their website.

7. In Mar 2003 to Jun 2006, as Principal Investigator, I led a multi-disciplinary multi-organization research project “The All-teRrain Advanced NeTwork of Ubiquitous MobiLe Asynchronous Systems (TARANTULAS)” to design and develop a network architecture and protocols that integrate an infrastructure-less location estimation system to support the command, control and communication needs of the network of mobile autonomous systems working together in collaboration to accomplish a mission. The project was awarded S\$668,000 funding by A*STAR and the team comprised more than 20 active research staff members and graduate students from three research areas, viz., communications and networking, RF and localization, and collaborative robotics.

The key result of this research is a hop-count localization scheme that accounts for uneven node density in the network and is able to provide accurate location estimation without any infrastructure support. This scheme is being evaluated as a candidate for tracking in urban environments by a 9-month project funded by DSTA for S\$248,415.

8. With the formation of I²R in 2003, I was appointed as Manager of the Networking Department for a two-year term from April 2003 to March 2005. My responsibilities included identifying high impact research areas in the area of networking, planning department research roadmap, and ensuring that the department (which comprises 30 research staff and more than 20 postgraduate students) meets the objectives set by our parent agency, the Agency for Science, Technology and Research (A*STAR) and I²R’s Executive Director.

9. Steering Committee of the Asia-Pacific (AP) IPv6 Task Force (as one of the two Singapore representatives) – this is a regional task force made up of national IPv6 promotional and research groups from nine AP economies. [<http://www.ap-ipv6tf.org/>]

10. In period 1999-2002, as Director of the Internet Technologies (ITEC) programme in the Centre for Wireless Communications (CWC) and the Institute for Communications Research (ICR), I started the ITEC programme in late 1999, defined the research focus, planned and managed its execution over the period 2000 to 2002, culminating in a successful demonstration during the annual ICR industry seminar in Sep 2002.

Key aspects of the programme, like the Advance Mobile Application Support Environment (AMASE) and the IPv6 activities, attracted significant industry interests locally as well as in the Asia Pacific region. We also contributed significantly as partners in European Commission funded projects under the 5th Framework Programme (Moby Dick project) and 6th Framework Programme (DAIDALOS project).

The ITEC programme received an annual budget of between S\$2M and S\$3M through a competitive internal funding process, involved more than 30 fulltime research staff and trained as many postgraduate/undergraduate students. As programme director, I also served on the CWC/ICR Executive and Research Committees, both of which were corporate management roles.

11. Project manager for two joint research projects with Siemens AG on Mobile and Wireless Internet technologies:

- a. Policy-Based Interface Selection (POBIS) S\$800K cash funding from Siemens AG

- b. Mobile Enhanced Wireless IP Proxy Internet (MERLION) with S\$1M cash funding from Siemens AG

I was responsible for securing the projects and funding, defining the project scope, designing the system architecture and managing the projects to ensure timely execution and achievement of project deliverables. The timely execution and successful completion of these projects led to the setup of a Siemens research and development centre in Singapore.

Academic Activities and Manpower Training

1. Courses taught:

- SWEN428 (Previously, NWEN439 Special Topic) Protocols and Architecture for the Internet of Things (since 2020), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course lecturer; worked closely with course coordinator to develop new course materials, assignments and assessment. This is a senior undergraduate and postgraduate course and I am responsible for teaching topics on low power wide area network technologies, while my co-lecturer focused on short range technologies.
- NWEN404 Mobile Computing (since 2010), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course coordinator and lecturer; developed new course materials, assignments and assessment. This is a senior undergraduate and postgraduate course on algorithms, protocols and techniques used to manage the mobility of users, devices, processes, etc, in computer and telecommunication networks.
- NWEN402 Internet Engineering (2010 ~ 2013), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. This is a senior undergraduate and postgraduate course in which I teach topics on Internet QoS, advanced transport layer protocols and network load balancing.
- NWEN401 Distributed Systems Design (2010 ~ 2011), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. This is a senior undergraduate and postgraduate course in which I taught topics on communications, middleware, content-based networking and overlay networks.
- ENGR401 Professional Practice (2011 ~ 2013, 2016), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Mentor students in critical thinking process on the responsibilities of being an Engineer, codes of conduct, ethical behaviour, people issues, etc.
- NWEN302 Computer Network Design (since 2010), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course coordinator and lecturer; course covers fundamental network design concepts; transport, routing, and medium access control protocols; and network performance analysis using simple queueing theory.
- NWEN303 Concurrent Programming (2015), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course lecturer for the distributed and parallel programming topics.
- NWEN304 Advanced Network Applications (2019), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course coordinator and lecturer; course covers technologies, algorithms, and systems for developing secure, scalable, and reliable web server applications.
- NWEN243 Clouds and Networking (2021), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course lecturer; my focus is on fundamental networking concepts, protocols and services, targeting the home/office network scenario. The aim of this course is to equip students with the knowledge to develop networked applications and set up a home/office network.

- NWEN241 Systems Programming (2017), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Course coordinator and lecturer; course covers programming at a low-level, for example in embedded systems, OS system level, or network protocol stacks. Topics include: an introduction to C language programming; and higher- level systems programming using Python scripting language.
- ENGR302 Project Management (2011 ~ 2014), School of Engineering and Computer Science (ECS), Victoria University of Wellington (VUW), New Zealand. Mentor students as they work in teams on a project of modest complexity, emphasizing teamwork, project planning, development of interface specifications and testing.
- CS3103 Computer Networks II (Jan 1999 ~ Dec 2002), Dept of Computer Science, School of Computing, NUS.
- CS4274 Mobile Computing (Jan 2003 ~ Jun 2006), Dept of Computer Science, School of Computing, NUS.
- EE5408 Mobile Computing (Jan 1998 ~ Jun 2003), Dept of Electrical and Computer Engineering, Faculty of Engineering, NUS.
- EE6108 Computer Networks (Aug ~ Oct 2009), School of Electrical and Electronic Engineering, College of Engineering, NTU.

2. Graduate research supervision:

- Ongoing PhD/MEng supervision (expected completion date):
 - 1) Xiaohan Hu (PhD 2025) *Scalable Trust and Secured Sharing of Big Data using Blockchain* (co-supervisor: Jyoti Sahni, Colin Simpson)
 - 2) Duncan Cameron (PhD 2024) *Empowering Rural Internet Service Providers With Self-Driving Networks* (main supervisor: Alvin Valera)
 - 3) Atefeh Talebian (PhD 2023) *Resource management for IoT in Fog/Edge Computing* (main supervisor: Alvin Valera)
 - 4) Tian Liang Li (PhD 2025, Inner Mongolia University, China)
 - 5) Tawera Manaena (ME 2023, Victoria University of Wellington)
 - 6) Jian Guo (MSc 2023, Inner Mongolia University, China)
 - 7) Ye Zhang (MSc 2023, Inner Mongolia University, China)
 - 8) Rui Fang (MSc 2023, Sichuan Agricultural University, China)
 - 9) Qi Wei Xiang (MSc 2023, Sichuan Agricultural University, China)
 - 10) Shu Tao Lu (MSc 2024, Inner Mongolia University, China)
 - 11) Xing Yun He (MSc 2024, Inner Mongolia University, China)
- PhD (graduation year):
 - 1) Farah Hoteit (PhD 2022, University of Franche-Comté, France) *Routing in EM-based Nano-networks* (main supervisor: Eugen Dedu, FEMTO-ST)
 - 2) Murugaraj Odiathevar (PhD 2021, Victoria University of Wellington, NZ) *A Framework for Anomaly Detection under Dynamic and Distributed Scenarios* (co-supervisor: Marcus Freat)
 - 3) Jakob Pfender (PhD 2021, Victoria University of Wellington, NZ) *Distributed Event Detection in the Internet of Things* (co-supervisor: Alvin Valera)
 - 4) Lina Hao (PhD 2019, Victoria University of Wellington, NZ) *Self-Organizing Network (SON) Functionalities for Mobility Management in WiFi Networks* (Main supervisor: Bryan Ng)
 - 5) Deepak Singh (PhD 2019, Victoria University of Wellington, NZ) *Performance analysis of SDN controller architectures* (Main supervisor: Bryan Ng)
 - 6) Abigail Koay (PhD 2019, Victoria University of Wellington, NZ) *Detecting and Defending against Low Intensity DDoS Attack* (Main supervisor: Ian Welch)
 - 7) Hang Yu (PhD 2018, Victoria University of Wellington, NZ) *Data Delivery in Electromagnetic-based Wireless Nano Sensor Networks* (co-supervisor: Bryan Ng)

- 8) Liang Yang (PhD 2018, Victoria University of Wellington, NZ) Formal Representation and Application of Forwarding Table Entries in Software Defined Networking (main supervisor: Bryan Ng)
- 9) Normalia Samian (PhD 2018, Universiti Putra Malaysia) Achieving Cooperation in Multihop Wireless Networks (main supervisor in UPM)
- 10) Daniel Burmester (PhD 2018, Victoria University of Wellington, NZ) Nanogrid interactions in a microgrid structure (main supervisor: Ramesh Rayudu)
- 11) David Harrison (2017, Victoria University of Wellington, NZ) Connectivity and Coverage in Energy Harvesting Wireless Sensor Networks for Rare Events
- 12) Eu, Zhi Ang (2011, National University of Singapore) Networking Protocols for Energy Harvesting Wireless Sensor Networks (co-sup: Dr Hwee Pink TAN, Institute for Infocomm Research, Singapore)
- 13) Wang, Haiguang (2009, National University of Singapore) Robust and Energy Efficient Routing for Wireless Sensor Network
- 14) Liu, Zheng (2008, National University of Singapore) Multi-robot Cooperative Surveillance in Unknown Environments
- 15) Mani, Mehdi (2008, Institut Telecom Sudparis, France) Converged Communication Services: Overlay Strategies from Centralized to Peer-to-Peer [Co-supervised with Noël Crespi]
- 16) Mar, Choong Hock (2008, National University of Singapore) Energy Efficient Cooperative Mobile Sensor Network
- 17) Er, Inn Inn (2007, National University of Singapore) A Scalable Cluster-Based Multicast Routing Protocol for Mobile Ad Hoc Network [Infocomm Development Authority Fellowship, 2004; Dean's Graduate Award, 2005/2006.]
- 18) Xiao, Hannan (2003, National University of Singapore) Flexible quality of service model for mobile Ad Hoc networks
- 19) Xiao, Xiaojun (2001, National University of Singapore) On quality-of-service issues in hybrid fiber/coax networks

2. Masters by Research (graduation year):

- 1) Hu Liu (2021, Inner Mongolia University, China)
- 2) Yintu Bao (2021, Inner Mongolia University, China)
- 3) Chung Yup Kim (2020, Victoria University of Wellington, NZ) Towards Blockchain Network Platform for IoT Data Integrity and Scalability
- 4) Jordan Ansell (2017, Victoria University of Wellington, NZ) A Framework for the Performance Analysis of Software Defined Networks
- 5) Jarrod Bakker (2017, Victoria University of Wellington, NZ) Improving BYOD Network Security with a SDN-based Statistical Classifier for Anomalous Network Traffic
- 6) Elliott Jiaqi Wen (2017, Victoria University of Wellington, NZ) Providing Acceleration for Mobile Gaming as a Service (Co-supervisor: Bryan Ng)
- 7) Matthew J Hayes (2016, Victoria University of Wellington, NZ) Scalability and Performance Considerations for Traffic Classification in Software Defined Networks (Co-sup: Bryan Ng, VUW)
- 8) Jonathan P Olds (2015, Victoria University of Wellington, NZ) Small batteryless wireless solar powered GPS receivers for subcentimeter land deformation monitoring
- 9) Saurabh Singh (2015, Victoria University of Wellington, NZ) Medium Access Control Optimization for Structural Health Monitoring using Wireless Sensor Networks
- 10) Lin, Wei-chuan (2013, Victoria University of Wellington, NZ) Exploiting Radio Irregularity for Automated People Counting (co-sup: Wei LI, VU, BC, Canada)
- 11) Liu, Nan (2012) Performance Evaluation of Routing Metrics for Community Wireless Mesh Networks
- 12) Chopra, Ankit (2012, Victoria University of Wellington, NZ) Association Control based Load Balancing in Wireless Cellular Networks Using Preamble Sequences
- 13) Gwee, Choon Lim (2009, Nanyang Technological University, Singapore) Cross-Layer Design Approach for QoS in Ad Hoc Networks

- 14) Ng, See Kee (2008, National University of Singapore) A Game Theoretical Model for Collaborative Routing in Selfish, Tariff-free Multi-hop Wireless Network
 - 15) Kumar, Sukanta Hazra (2008, National University of Singapore) Achilles: Design of a High Capacity Mesh Network with Directional Antennas
 - 16) Mishra, Parijat (2007, National University of Singapore) An Identity Based Framework for Security and Privacy in Pervasive Networks
 - 17) Foo, Ricky (2006, National University of Singapore) METEOR – The ‘Misbehaviour deTEctor and enfORcer’: A Protocol to Mitigate Routing Misbehavior Under Mobile Ad-Hoc Networks
 - 18) Wu, Mintao (2006, National University of Singapore) Location-Aided Routing Protocol in Hybrid Wired-Wireless Networks
 - 19) Cho, Chia Yuan (2005, National University of Singapore) A Framework for Modeling, Analysis and Optimization of Robust Header Compression
 - 20) Lochmatter, Thomas (2005, EPFL, Switzerland) Probabilistic Path Discovery with Snakes in Ad Hoc Networks
 - 21) Wong, Sau Yee (2005, National University of Singapore) Density-aware Hop-Count Localization (DHL) Algorithm in Unevenly Distributed Wireless Sensor Networks
 - 22) Xie, Qunying (2005, National University of Singapore) Mobility Management in Next Generation Networks
 - 23) Zhang, Junxia (2005, National University of Singapore) Capacity Evaluation for Ad Hoc Networks with End-To-End Delay Constraints
 - 24) Cheng Jing (2004, National University of Singapore) Medium Access Control and Energy-Efficient Routing for Mobile Ad-Hoc Networks
 - 25) Li, Feng (2004, National University of Singapore) Quality of Service and Mobility Management in IP-based Radio Access Networks
 - 26) Liu, Yuzhe (2004, National University of Singapore) A Priority-based Multi-path Routing Protocol for Sensor Networks
 - 27) Ng, Keng Seng (2004, National University of Singapore) Securing Mobile Ad Hoc Network Routing Protocols
 - 28) Ng, Kwang Loong Stanley (2004, National University of Singapore) P2P Real Time Mobility Using SIP and Mobile IPv6
 - 29) Wu, Wei (2004, National University of Singapore) End-to-end Internet Quality of Service with IntServ/DiffServ, Mobile IPv6 and IEEE802.11e
 - 30) Yang, Luqing (2004, National University of Singapore) A Study of TCP Performance in Wired-cum-Ad Hoc Environments
 - 31) Yu, Yuding (2004, National University of Singapore) Virtual Topology Design for Optical WDM Networks
 - 32) Valera, Alvin C. (2003, National University of Singapore) Cooperative Packet Caching and Shortest Multipath Routing (CHAMP) in Mobile Ad Hoc Networks
 - 33) Du, Jun (2001, National University of Singapore) Public Key Based Authentication Protocols in Mobile IP
 - 34) Ge, Yu (2001, National University of Singapore) Integration of Internet Telephony Call Signaling with Resource Reservation and Personal Mobility
 - 35) Liu, Liqun (2001, National University of Singapore) Improving Mobile IP Handover Performance in Wireless Networks-Internet Interworking
 - 36) Shanguan Xuan (2001, National University of Singapore) A Lightweight Resource Reservation Protocol for Mobile Hosts in the Internet
 - 37) Shen, Qi (2001, National University of Singapore) On Providing Flow Transparent Mobility Support for IPv6-Based Wireless Real-Time Services
 - 38) Gao, Qing (2000, National University of Singapore) Improved Authentication Protocol for Mobile IP
- Masters by Coursework – Research Project Topic (graduation year):
- 1) Tan, Beng Sing Eddie (2006, National University of Singapore) Hop count based Localization Implementation in Wireless Sensor Networks
 - 2) Wu, Hongtao (2005, National University of Singapore) An Implementation of Diameter Base Protocol

- 3) Qiao, Hong (2004, National University of Singapore) Enhancement of Internationalized Domain Name Service
- 4) Shi, Donglin (2003, National University of Singapore) Integration of QoS with Mobility in IPv6
- 5) Kabilan, Badrinath (2003, National University of Singapore) Implementation of DHCP Extensions for Mobile Users
- 6) Tan, Hwee Pink (2000, National University of Singapore) TCP Performance over EGPRS/EDGE

3. Thesis examined:

- PhD:

- 1) Bilhanan Silverajan, Tampere University, Finland, 2020.
- 2) Hazim Jarrah, Auckland University of Technology, New Zealand, 2019.
- 3) Binayak Kar, National Central University, Taiwan, 2018.
- 4) Manuel López Martín, University of Valladolid, Spain, 2018.
- 5) Scott Sleep, University of South Australia, Australia, 2016.
- 6) Venu Madhav Tekulapally, National Institute of Technology, Warangal, India, 2015 & 2013.
- 7) Jiradett Kerdsri, Thammasat University, Thailand, 2014.
- 8) Yuwei Xu, University of Otago, New Zealand, 2013.
- 9) Samar Shailendra, Indian Institute of Technology Guwahati, India, 2013.
- 10) Priyatosh Mandal, Indian Institute of Technology Delhi, India, 2013.
- 11) Qing Zhang, Nanyang Technological University, Singapore, 2012.
- 12) Kiam Cheng How, Nanyang Technological University, Singapore, 2011.
- 13) Sayan Kumar Ray, University of Canterbury, New Zealand, 2011.
- 14) G P Sajeev, National Institute of Technology, Calicut, 2011.
- 15) Cristian Barrué Subirana, Technical University of Catalonia, Spain, 2010.
- 16) Yu Ge, Nanyang Technological University, Singapore, 2009/2010.
- 17) Mayank Keshariya, University of Canterbury, New Zealand, 2009.
- 18) Mehdi Mani, Institut Telecom Sud-Paris, Evry, France, 2008.
- 19) Binbin Chen, National University of Singapore, Singapore, 2004/2005. (PhD Qualifier)

- MEng/MSc:

- 1) Jackson Dean Godfrey, Department of Electrical and Computer Engineering, University of Canterbury, New Zealand, 2021.
- 2) Yu Ren, School of Engineering and Computer Science, Victoria University of Wellington, New Zealand, 2010.
- 3) Jong-Sun Chung, Department of Electrical and Computer Engineering, University of Canterbury, New Zealand, 2010.
- 4) Ravinder Tamishetty, School of Computing, National University of Singapore, Singapore, 2006.
- 5) Genping Liu, School of Computer Engineering, Nanyang Technological University, Singapore, 2005.
- 6) Jian Yang Ye, Department of Electrical and Computer Engineering, National University of Singapore, Singapore, 2003.
- 7) Liang Yu, School of Computing, National University of Singapore, Singapore, 2003.
- 8) Kwang Yong Koh, School of Computing, National University of Singapore, 2002.
- 9) Xiang Yu, Department of Electrical and Computer Engineering, National University of Singapore, Singapore, 2001.

4. Industry courses:

- 1) TCP/IP (2000~2001), Specialist Manpower Programme organized by the National University of Singapore and Economic Development Board of Singapore.

5. Research Mentor (for high school students):

- Science Training and Research (STaR) programme, National Junior College, May 2007-Apr 2008
- Research Attachment programme, Hwa Chong Junior College, Nov-Dec 2005.

Research Grants and Consultancy

- Science for Technology Innovation (SfTI) BioSecurity Technology Spearhead, October 1, 2021 – June 31, 2024. (Leader, network subsystem, NZ\$395,306.)
- Establishing Trust in Internet of Things using Physically Unclonable Functions and Blockchains, Royal Society of New Zealand, July 2018 Catalyst Seeding: General, Ref. No. 18-VUW-043-CSG, February 1, 2019 – January 31, 2021 (extended to May 31, 2022), NZ\$79,750. (PI)
- Software-Defined Green Internet of Things, Huawei NZ Research Programme, July 2016-June 2019, NZ\$330,000. (PI)
- Scalable Traffic Classification in Internet of Things (IoT) for Network Anomaly Detection, Jan-Dec 2018, ISIF Asia Network Operations Research Grant, US\$34,000. (PI)
- Handover Prediction for Mobile Internet of Things, 2017 University Research Fund, NZ\$25,076.09. (PI)
- Traffic classification in Enterprise Networks using Software Defined Networking, InternetNZ Internet Research funding round 2015, ref: IR-201502, 16 months, NZ\$30,000. (PI)
- Performance Evaluation and Analytical Modelling of SDN and OpenFlow-based Networks and Systems, NZ-Japan Joint Research Programme, ref: JSP-VUW1401-JR, Apr 2015 – Mar 2017, NZ\$60,000. (PI)
- Why age-old pillars of networking protocols fail in the Internet of Everything, 2015 University Research Fund, NZ\$25,000. (PI)
- Wireless Sensing System for Land Movement Monitoring and Landslide Detection, EQC 2014 Biennial Grant, 03/2014-02/2015, NZ\$57,288. (PI)
- EC Framework 7, Erasmus Mundus Action 2 – Strand 2 – Partnerships Call for Proposals EACEA/38/12, THELXINOE - Erasmus Euro-Oceanian Smart City Network consortium led by University of Malaga, Spain, 2013-2017. (Co-PI, representing School of Engineering and Computer Science, Victoria University of Wellington.) Total award € 1,188,350, shared by 10 partners.
- Communications and networking technologies for smarter, more efficient power distribution systems, India Studies Research Grant 2013, NZ India Research Institute, NZ\$28,000. (PI)
- Vibration-powered Wireless Sensors for Structural Health Monitoring of Critical Infrastructure”, TechJumpStart Grant 2012, VicLink and KiwiNet, NZ\$10,000. (PI)
- Smart Home Metering and Appliance Control”, Co-PI, TechJumpStart Grant 2012, VicLink and KiwiNet, NZ\$10,000. (Co-PI)
- Wireless Patient Monitoring, 2013 University Research Fund, NZ\$50,000. (PI)
- Addressing Fundamental Flaws in Routing for Wireless Multihop Networks, 2012 University Research Fund, NZ\$36,288.75. (PI)
- Establishing Collaboration on Smart Grid Network Engineering, RSNZ/IMF Grant, 2011 International Mobility Fund, NZ\$6,090. (PI)

- Characterization of Energy Harvesting for the Design of Wireless Sensor Networks, 2011 University Research Fund, NZ\$32,434.90. (PI)
- Establishing research network on sustainable environmentally friendly wireless networks for sensing and communications", RSNZ/ISAT Grant 2010, Bilateral Research Activities Programme, NZ\$8,000. (PI)
- IPENZ FutureInTech Visiting Industry Professional Funding, May 2010~Apr 2011, NZ\$5,000. (PI)
- DSTA/NUS "Robust Multihop Underwater Network to Support Long-Range Sensing Applications", Nov 2008 – Oct 2010, S\$280,000. (PI)
- Design of Autonomous UUV Communication architecture, DSTA/Mindef, Oct 2008 - Dec 2009, S\$892,156. (PI)
- Delay Tolerant Networking for Extreme Scenarios, DSTA/Mindef, Nov 2008 - Oct 2009, S\$311,600. (PI)
- Force Tracking for Urban Environment, DSTA/Mindef, Nov 2008 – Aug 2009, S\$245,428. (PI)
- French STIC-Asie programme "MANET and Mesh Interconnectivity in Vehicular Ad hoc Networks (MAMI)", 2-yr funding to set up network of research collaboration among French and Asian organizations, Apr 2008 – Mar 2010, €5250 for Year I. (Co-PI)
- French STIC-Asie programme "Wireless broadband Overlay network Architectures and Applications (Woaa!)", 2-yr funding to set up network of research collaboration among French and Asian organizations, Apr 2008 – Mar 2010, €3125 for Year I. (Co-PI)
- A*STAR-MPA/CORE/OTRP 071-135-0026 "Intelligent Deepwater Mooring Systems (i-MoorS)" Co-PI (Underwater Sensor Networks), Sep 2007 – Feb 2010, S\$71,000. (Co-PI)
- Consultant to SysEng (S) Pte Ltd (local SME) on "Smart wireless sensors for Construction and Environmental Monitoring Applications", Jun 2006, \$10,000. (PI)
- Consultant to DSO National Labs on "WiMax Field Trial", Mar 2006, S\$15,000. (PI)
- French SICT-Asie programme "Multimedia Architecture and Applications based on SIP (MySIP)", 2-yr funding to set up network of research collaboration among French and Asian organizations, Jan 2006 – Dec 2007, €10,265 (S\$22,708). (Co-PI)
- A*STAR/SERC/EHS 042-111-0068 "MANTIS: Mobile Ad-Hoc Networks for Transport Information System" (pilot project), Oct 2004 – Mar 2005, S\$8,000. (PI)
- A*STAR/SERC/EHS 022-106-0049 "TARANTULAS: The All-terrain Advanced Network of Ubiquitous Mobile Asynchronous Systems", Apr 2003 – Mar 2006, S\$668,000. (PI)
- A*STAR/SERC/EHS 012-106-0061 "TARANTULAS: The All-terrain Advanced Network of Ubiquitous Mobile Asynchronous Systems" (pilot project), Nov 2001 – Jul 2002, S\$29,000. (PI)
- Siemens AG "Policy Based Interface Selection (POBIS)", Sep 2000 – Feb 2002, S\$796,115. (PI)
- Siemens AG "Mobile Enhanced Wireless IP Proxy Internet (MERLION)", Nov 1999 – Mar 2001, S\$1,008,956. (PI)

Past Appointments/Designations

- 2006.4-2009.10 Senior Scientist and Leader of Wireless Sensor Networks Group, Networking Protocols Department, Institute for Infocomm Research (I²R), Agency for Science Technology and Research (A*STAR), Singapore
- 2002.7-2009.10 Adjunct Associate Professor, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

- 2002.1-2009.10 Faculty member, NUS Graduate School for Integrative Science and Engineering (NGS), National University of Singapore (NUS), Singapore
- 2005.4-2006.3 Lead Scientist (Re-designated as Senior Scientist to align to A*STAR structure) Networking Department, I²R
- 2003.4-2005.3 Department Manager
Networking Department, I²R
- 2003.4-2004.6 Adjunct Senior Fellow
Dept of Computer Science, School of Computing
National University of Singapore
- 2002.1-2003.3 Principal Member of Technical Staff
Programme Director, Internet Technologies
Institute for Communications Research
- 2001.4-2001.12 Principal Member of Technical Staff
Programme Director, Internet Technologies
Centre for Wireless Communications
- 2000.1-2003.3 Chief Technology Officer
TechnoBridge, ICT research consortium jointly established by TRILabs (CA) & I²R
- 2001.5-2003.1 Resident Fellow (Joint concurrent appointment)
King Edward VII Hall of Residence, National University of Singapore
- 2000.4-2001.3 Senior Member of Technical Staff
Programme Director, Internet Technologies
Centre for Wireless Communications
- 1998.1-2003.3 Teaching Fellow (Joint concurrent appointments)
Dept of Computer Science, and Dept of Electrical & Computer Engineering
National University of Singapore
- 1997.3-2000.3 Member of Technical Staff
Centre for Wireless Communications
- 1993-1997.2 *On leave to pursue Dr.Eng. degree in Kyoto University, Kyoto, Japan.*
- 1989-1992 Professional Officer
Department of Electrical Engineering
National University of Singapore
- 1987-1988 Software Systems Officer
Defence Science Organization

Technical, Professional and Standardization Activities

International and National Level Committees

1. Association for Computing Machinery, Singapore Chapter, Chairman (2009) and Vice-Chairman (2007-2008).
2. Telecommunications Standards Technical Committee (TSTC), Infocomm Development Authority of Singapore (IDA), 2005.8.1-2008.7.31 (3-year term) and 2003.1.1-2004.12.31.
3. Asia-Pacific IPv6 Task Force (Founding and Steering Committee member), IPv6 Forum, IETF[‡], APAN^{*}, and IDA Infocomm Technology Roadmap.
4. Leader, IPv6 and Wireless Sensor Network Interest Groups, Industrial Infocomm Technology (I²T) initiative, Singapore Industrial Automation Association (SIAA)

[‡] Internet Engineering Task Force

^{*} Asia Pacific Advanced Network consortium

Editorial Board/Guest Editor

1. Area Editor, Ad Hoc Networks Journal, Elsevier (since July 2019)
2. Associate Editor, IEEE Internet of Things Journal (since March 2019)
3. Associate Editor, IET Electronics Letters. (March 2018 to January 2021)
4. Associate Editor, IEICE Transactions on Communications. (since April 2017)
5. Editor, Transactions on Internet and Information Systems, Korean Society for Internet Information (KSII). (2013-2017)
6. Editorial Board Member, Journal of Information Processing (JIP), Information Society of Japan (IPSJ). (June 2012 to May 2015)
7. Editorial Board Member, International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC), InderScience Publishers. (since 2009)
8. Guest Editor, IEEE Internet of Things Journal, Special Issue on Wearable Sensor Based Big Data Analysis for Smart Health (2018)
9. Guest Editor, Annals of Telecommunications, Special Issue on Health Care on Smart and Mobile Devices. (2015/2016)
10. Guest Editor, International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC), Special Issue on Application-Oriented Protocol Design for Wireless Ad Hoc Networks. (2012/2013)
11. Guest Editor, International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC), Special Issue on Underwater Sensor Networks: Technology and Theory. (2011/2012)
12. Editor (with YK Tan), Sustainable Wireless Sensor Networks, ISBN 978-953-307-297-5, InTech, 2011.
13. Guest Editor, International Journal of Digital Multimedia Broadcasting, Special Issue on P2P Multimedia Social Networking and Communication Systems. (2009)
14. Editorial Board Member, International Journal of Multimedia and Ubiquitous Engineering, Science and Engineering Research Support Centre, Korea. (since 2007)
15. Special Editorial Team, IET Communications, Special Issue on Wireless Mobile Networks: Cross-Layer Communications. (2006)

Keynote/invited lectures

1. **Keynote presentation**, 'Making Sense out of IoT Non-Sense,' IEEE 12th Latin-American Conference on Communications (Latincom), 18-20 November 2020.
2. **Keynote presentation**, 'Caching Strategies for Named Data Networking in IoT', EAI MOBILEWARE 2020 – 9th International Conference on MOBILE Wireless MiddleWARE, Operating Systems, and Applications, 11-12 July 2020.
3. Invited Talk, 'Information-Centric Networking in the Internet of Things – Challenges of Caching under Resource Constraints,' Workshop on the Hot Technologies and Its Trend of Corresponding Electromagnetic Environment, in the 8th IEEE International Symposium on Microwave, Antenna, Propagation and EMC Technologies, November 5, 2019
4. Invited Talk, 'Making Sense out of IoT Non-Sense', Department of Communication Technology and Networks, Universiti Putra Malaysia, Malaysia, 8 Nov 2018.
5. Invited Talk, 'Making Sense out of IoT Non-Sense', IEEE/CIC International Conference on Communications in China, 22-24 Oct 2017, Qingdao, China.
6. **Keynote presentation**, 'Making Sense out of IoT Non-Sense', International Telecommunication Networks and Applications Conference, 7-9 December 2016, Dunedin, Otago, New Zealand.
7. 'An introduction to IoT - a New Zealand view', ITX 2016 Conference, 11-13 July 2016, Wellington, New Zealand.

8. 'Making Sense out of IoT Non-Sense', NZ IoT Innovation Forum, 18 May 2016, Auckland, New Zealand.
9. 'VANETs - How SDN can (cannot) help', Invited Talk, 10th International Conference on Information, Communications and Signal Processing, 2-4 December 2015, Singapore.
10. 'QoS Classification in the Internet of Things', Invited Lecture, 21 February 2014, Faculty of Engineering, National Taipei University (NTPU), Taipei, Taiwan.
11. 'QoS Classification in the Internet of Things', Invited Lecture, 19 February 2014, Department of Electrical Engineering and Computer Science, Fu Jen Catholic University (FJU), Taipei, Taiwan.
12. 'Wireless Multihop Networks', Invited Lecture, 18 April 2012, Department of Electrical Engineering, Fu Jen Catholic University (FJUEE), Taipei, Taiwan.
13. 'Application of Discriminant Analysis for People Counting using Radio Irregularity in Wireless Sensor Networks', Urban Operations Research Workshop, Nanzan University, Nagoya, Japan, Dec 17-18, 2011.
14. 'Information & Communication Technology (ICT) Powered by Energy Harvesting', Intel-NTU Connected Context Computing Center and College of Electrical Engineering and Computer Science, National Taiwan University, Taipei, Taiwan, April 29, 2011, (see also: <http://ccc.ntu.edu.tw/index.php/en/event/30>).
15. 'Wireless Communication Networks in Extreme Environments – Trends and Challenges', College of Science and Engineering, Fu Jen Catholic University, Taipei, Taiwan, April 27, 2011.
16. 'Wireless Communication Networks in Extreme Environments – Trends and Challenges', Institute of Computer Science and Information Engineering, National Ilan University, Ilan, Taiwan, April 25, 2011.
17. 'Information & Communication Technology (ICT) Powered by Energy Harvesting', National Chi-Nan University, Nantou, Taiwan, April 22, 2011.
18. 'Wireless Communication Networks in Extreme Environments: Trends and Challenges', National Chi-Nan University, Nantou, Taiwan, April 21, 2011.
19. 'Information & Communication Technology (ICT) Powered by Energy Harvesting', The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, January 12, 2011.
20. 'Wireless Communication Networks in Extreme Environments: Trends and Challenges', The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, December 22, 2010.
21. 'Trends and Challenges of Wireless Communication Networks in Extreme Environments', New Zealand Computer Society (NZCS), Wellington, October 28, 2010.
22. 'Information communication technology powered by energy harvesting', Graduate School of Informatics, Shizuoka University, Shizuoka, Japan, October 4, 2010.
23. Inaugural Professorial Lecture, 'Wireless Communication Networks in Extreme Environments: Trends and Challenges', Victoria University of Wellington, May 11, 2010.
24. Invited talk, 'Home of the Future and Environmentally-Friendly Sensing', International Work Conference on Artificial Neural Networks (IWANN'09), Jun 10-12, 2009, Salamanca, Spain.
25. **Keynote presentation**, 'Wireless Sensor Networks Powered by Ambient Energy Harvesting – State-of-the-Art and Research Challenges', 6th Annual International Conference of the Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI) Association, May 7-9, 2009, Pattaya, Thailand.
26. 'Wireless Sensor Networks Powered by Ambient Energy Harvesting', Graduate School of Science and Technology, under 'Educational Program for Graduate Students of Information Technology based on Manifesto', Nov 25, 2008, Shizuoka University, Japan.
27. 'Wireless Sensor Networks Powered by Ambient Energy Harvesting', Regional Industrial Networking Conference (RINC2008), Nov 6-7, 2008, Singapore Polytechnic, Singapore.
28. 'Designing Robust Wireless Sensor Networks for Urban Development', International Workshop on Urban Operations Research, Dec 22-23, 2007, Nanzan University, Nagoya, Japan.

29. 'Current networking and routing protocols are shackles', Cutting Edge Communications Architecture Strategy Forum, April 13, 2007, Future Systems Directorate, Ministry of Defence, Singapore.
30. 'IPv6 in Machine-to-Machine Communications', Regional Industrial Networking Conference (RINC2006), Nov 8-9, 2006, Singapore Polytechnic, Singapore.
31. 'Wireless Sensor Networks – Research vs Reality', ICCS 2006 Tutorial, Oct 30, 2006, Singapore.
32. 'Humans speak IPv4, Machines speak IPv6', Asia-Pacific Telecommunity (APT) Workshop on IPv6, Feb 27-Mar 1, 2006, Langkawi, Penang, Malaysia.
33. **Keynote presentation**, 'Quality of Service in Mobile Ad Hoc Networks – Myth or Reality?', Australian Telecommunication Networks and Applications Conference (ATNAC2004), Dec 8-10, 2004, Sydney, Australia.
34. 'IPv6 – THE Internet Protocol', Industry Talk, Singapore Industrial Automation Association (SIAA), Industrial Infocomm Technology (I²T) Business Get Together, 22 July, 2004.
35. 'Status of IPv6 in Singapore', IPv6 Summer Retreat 2003, 23 Aug 2003, Lotte Hotel Seoul-Jamsil, Seoul, Korea.
36. 'Voice Video with QoS over IPv6', Global IPv6 Summit in Asia-Pacific (held in conjunction with APRICOT 2003), 24-26 Feb 2003, Taipei, Taiwan.
37. 'IPv6: The new Internet tidal wave', Global IP Carriers Asia 2002, 23-24 October 2002, Sheraton HK & Towers, Hong Kong.
38. 'IPv6 – Next Generation Internet Protocol', IP-VPN 2002, 12-13 August 2002, Singapore.
39. 'IPv6 – This Generation Internet Protocol', SingAREN Seminar, August 2002, Singapore.

Conferences/symposiums/workshops organized

1. Steering Committee Member:
 - International Conference on Queueing Theory and Networks Applications (QTNA)
 - International Conference on Communication Systems and Networks (ComNet 2016)
 - Mobility Conference
2. General Chair/Co-chair
 - 11th International Conference on Queueing Theory and Network Applications (QTNA2016), December 13-15, 2016, Wellington, New Zealand.
 - 14th International Conference on Pervasive Intelligence and Computing (PICom), August 8-12, 2016, Auckland, New Zealand.
 - Energy Harvesting Communications Workshop, in conjunction with 11th IEEE International Conference on Sensing, Communication, and Networking (SECON), June 30 - July 3, 2014, Singapore.
 - Symposium on Sustainable and Adaptive Sensor Networks, 9th International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), 21-24 Apr 2014, Singapore.
 - 3rd International Workshop on Underwater Networks (WUnderNet), in conjunction with AINA-2011, 22-25 March 2011, Singapore.
 - IEEE 25th International Conference on Advanced Information Networking and Applications (AINA), 22-25 Mar 2011, Singapore.
 - 2nd IEEE International Workshop on Underwater Networks (WUnderNet), in conjunction with IEEE ICC2010, 23-27 May 2010, Cape Town, South Africa.
 - 6th Mobility Conference 2009, Sep 2-4, 2009, Nice, France.
 - International Conference on Queueing Theory and Network Applications (QTNA2009), Jul 29-31, 2009, Singapore.
 - IEEE International Workshop on Underwater Networks (WUnderNet), 26-29 May 2009, Bradford, UK.

- 3rd Asia-Pacific Symposium on Queueing Theory and Network Applications (QTNA2008), Jul 30-Aug 2, 2008, Taipei, Taiwan.
3. Technical Program Chair/Co-chair/Vice-chair:
- Pervasive and Ubiquitous Computing Track, 35th International Conference on Advanced Information Networking and Applications (AINA-2021), May 12 - 14, 2021, Toronto, Canada.
 - The IEEE 4th International Conference on Future Internet of Things and Cloud (FiCloud 2016), August 22-24, 2016, Vienna, Austria.
 - 3rd International Conference on Sensor Technologies and Applications (SENSORCOMM 2009), June 14-19, 2009, Athens, Greece.
 - Mobile Networks and Applications Track, IEEE 23rd International Conference on Advanced Information Networking and Applications (AINA2009), May 25-29, 2009, Bradford, UK.
 - 5th Mobility Conference 2008, Sep 9-11, 2008, Ilan, Taiwan.
 - Communication Technology and Protocols Track, IEEE 22nd International Conference on Advanced Information Networking and Applications (AINA2008), Mar 25-28, 2008, GinoWan, Okinawa, Japan.
 - 4th Mobility Conference 2007, Sep 2007, Singapore.
 - EuroSingapore2005, Jan 27-28, 2005, Singapore.
 - 7th International Conference on Communication Systems, Nov 19-23, 2000, Singapore.
 - Singapore International Conference on Networks (SICON), Sept 5-6, 1991.
4. Other appointments:
- Publicity Chair, 11th International Conference on Mobile Computing and Ubiquitous Networking, October 5-8, Auckland, New Zealand
 - Award co-chair, IEEE 26th International Conference on Advanced Information Networking and Applications (AINA), March 26-29, 2012, Fukuoka, Japan.
 - Industrial Advisor, Asia Pacific Microwave Conference (APMC 2008), Dec 16-20, 2008, Hong Kong and Macau.
5. Technical Program Committee Member
- IEEE Global Communications Conference (Globecom), 4-8 December 2022, Rio de Janeiro, Brazil.
 - 23rd IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), 14-17 June 2022, Belfast, Ireland.
 - IEEE International Conference on Communications (ICC), 16-20 May 2022, Seoul, South Korea.
 - IEEE Wireless Communications and Networking Conference (WCNC), 10-13 April 2022, Austin, TX, USA.
 - 14th International Conference on COMMunication Systems & NETworkS (COMSNET), 3-9 January 2022, Hybrid Conference, Bengaluru, India.
 - IEEE International Conference on Communications (ICC), 14-23 June 2021, Virtual/ Montreal, Canada.
 - 45th IEEE Conference on Local Computer Networks (LCN), 16-19 November 2020, Sydney, Australia.
 - EAI 9th International Conference on MOBILE Wireless MiddleWARE, Operating Systems, and Applications, 10-12 July 2020, Hohhot, China.
 - IEEE International Conference on Communications (ICC), 7-11 June 2021, Virtual.
 - 3rd International Conference on Computing and Network Communications (CoCoNet'19), December 18-21, 2019, Trivandrum, Kerala, India.
 - 44th IEEE Conference on Local Computer Networks (LCN), October 14-17, 2019, Osnabrück, Germany.
 - 20th IEEE International Symposium on A World of Wireless, Mobile and Multimedia Networks (WoWMoM), June 9-12, 2019, Washington DC, USA.
 - IEEE International Conference on Communications (ICC), 20-24 May 2019, Shanghai, China.

- IEEE Wireless Communications and Networking Conference (WCNC), 15-19 April 2019, Marrakech, Morocco.
- 43rd IEEE Conference on Local Computer Networks (LCN), 1-4 October 2018, Chicago, USA.
- 2nd International Conference on Computing and Network Communications (CoCoNet) 15-17 August 2018, Astana, Kazakhstan.
- 19th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), 12-15 June 2018, Chania, Greece.
- IEEE International Communications Conference (ICC), 20-24 May 2018, Kansas City, MO, USA – Wireless Communications Symposium & SAC Symposium e-Health.
- 5th International Workshop on Energy Harvesting & Energy Neutral Sensing Systems (ENSsys), 5 November 2017.
- 9th International Conference on Wireless Communications and Signal Processing, 11-13 October 2017, Nanjing, China.
- 42nd IEEE Conference on Local Computer Networks (LCN), 9-12 October 2017, Singapore.
- 15th IEEE International Conference on Communication Systems (ICCS), 14-16 December 2016, Shenzhen, China.
- 41st IEEE Conference on Local Computer Networks (LCN), 7-10 November 2016, Dubai, UAE.
- 4th International Workshop on Energy Harvesting & Energy Neutral Sensing Systems (ENSsys), 16 November 2016.
- 22nd Asia-Pacific Conference on Communications (APCC), 25-27 August 2016, Yogyakarta, Indonesia
- 15th IFIP Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net), 20-22 June 2016, Vilanova i la Geltrú, Barcelona, Spain.
- 3rd International Workshop on Energy Harvesting & Energy Neutral Sensing Systems (ENSsys), 1 November 2015
- 40th IEEE Conference on Local Computer Networks (LCN), 26-29 October 2015, Clearwater Beach, Florida, USA.
- 10th International Conference on Queueing Theory and Network Applications (QTNA), 17-20 August 2014, Hanoi, Vietnam.
- 7th IFIP International Conference on New Technologies, Mobility and Security (NTMS) – Mobility & Wireless Networks Track, 26-29 July 2015, Paris, France.
- 14th IFIP Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net), 17-19 June 2015, Vilamoura, Algarve, Portugal.
- IEEE International Communications Conference (ICC), 8-12 June 2015, London, UK – Wireless Communications Symposium.
- 10th International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), 7-9 April 2015, Singapore.
- 2nd International Workshop on Energy-Neutral Sensing Systems, in conjunction with ACM SenSys 2014, 6 November 2014, Memphis, TN, USA.
- 14th IEEE International Conference on Communication Systems (ICCS), 19-21 November 2014, Macau, China.
- 39th IEEE Conference on Local Computer Networks (LCN), 8-11 September 2014, Edmonton, Canada.
- 9th International Conference on Queueing Theory and Network Applications (QTNA), 18-21 August 2014, Bellingham, Washington, USA.
- IEEE International Workshop on M2M Communications for Next Generation IoT, co-located with IEEE ICC 2014, June 10th, 2014, Sydney, Australia.
- 13th IFIP Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net), 2-4 June 2014, Piran, Slovenia.
- 11th Annual IEEE Consumer Communications & Networking Conference (CCNC) - Green Computing and Communications, 10-13 Jan 2014, Las Vegas, Nevada, USA.
- 38th Annual IEEE Conference on Local Computer Networks (LCN), 21-24 Oct 2013, Sydney, Australia.

- 8th International Conference on Queueing Theory and Network Applications (QTNA), 30 Jul – 2 Aug 2013, Taichung, Taiwan.
- 1st International Workshop on Network Management and Monitoring (NetMM), co-located with IEEE AINA 2013, 25-28 March 2013, Barcelona, Spain.
- 18th IEEE International Conference on Parallel and Distributed Systems (ICPADS) - Mobile, Sensor and Ubiquitous Computing Track, 3-5 Dec 2012, Singapore.
- 13th IEEE International Conference on Communication Systems (ICCS), 21-23 Nov 2012, Singapore.
- 7th International Conference on Broadband and Wireless Computing, Communication and Applications (BWCCA) - Wireless Home and Health Technologies Track, 12-14 Nov 2012, Victoria, Canada.
- 37th Annual IEEE Conference on Local Computer Networks (LCN), 22-25 Oct 2012, Clearwater, FL, USA.
- 7th International Conference on Queueing Theory and Network Applications (QTNA), 1-3 Aug 2012, Kyoto, Japan.
- 5th IFIP International Conference on New Technologies, Mobility and Security (NTMS) – Mobility Track, 7-10 May 2012, Istanbul, Turkey.
- 4th International Conference on Communications, Mobility, and Computing (CMC 2012) – Vehicular Technology and Telematics Symposium, 21-23 May 2012, Guilin University of Electronic Technology, Guilin, China.
- 8th International Conference on Information, Communications and Signal Processing (ICICS), December 13-16, 2011, Singapore.
- IEEE 26th International Conference on Advanced Information Networking and Applications (AINA) – Mobile Networks and Applications Track, March 26-29, 2012, Fukuoka, Japan.
- 6th ACM International Workshop on UnderWater Networks (WUWNet), 1-2 December 2011, Seattle, Washington, USA.
- World Congress on Information and Communication Technology (WICT) – Body Sensor Networks Track, December 11-14, 2011, Mumbai, India.
- 17th IEEE International Conference on Parallel and Distributed Systems (ICPADS) – Mobile Computing Track, December 7-9, 2011, Tainan, Taiwan.
- International Conference on Advanced Intelligence and Awareness Internet (AIAI), October 28-20, 2011, Shenzhen, China.
- 36th Annual IEEE Conference on Local Computer Networks (LCN), October 4-7, 2011, Bonn, Germany.
- 6th International Conference on Broadband and Wireless Computing, Communication and Applications (BWCCA), October 26-28, 2011, Barcelona, Spain.
- 1st International Workshop on Bio-Sensing, Processing, Application and Networking (BioSPAN), in conjunction with BWCCA 2011, October 26-28, 2011, Barcelona, Spain.
- 6th International Conference on Queueing Theory and Network Applications (QTNA2011), August 23-26, 2011, Seoul, Korea.
- 10th IFIP Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net), June 12-15, 2011, Favignana Island, Sicily, Italy.
- 1st Workshop on Interworking and Interoperable Networks and Services, in conjunction with ACM/IEEE 25th International Conference on Advanced Information Networking and Applications (AINA), March 22 - 25, 2011, Biopolis, Singapore.
- International Conference on Ubiquitous Information Management and Communication (ICUIMC), 21-23 Feb 2011, Seoul, Korea.
- International Conference on Communication and Signal Processing (ICCSP-2011), 10-12 Feb 2011, Calicut, India.
- 4th IFIP International Conference on New Technologies, Mobility and Security (NTMS) – Mobility Track, Feb 7~10, 2011, Paris, France.
- 3rd International Workshop on Sensor Networks and Ambient Intelligence (SeNAml), in conjunction with IEEE/IFIP EUC 2010, December 11-13, 2010, Hong Kong SAR, China.
- International Conference on University Basic Computers Education and e-Learning (iCube), December 9-11, 2010, Tamkang University, Taiwan.

- 12th IEEE International Conference on Communication Systems (ICCS 2010), 17-20 Nov 2010, Singapore.
- 16th Asia-Pacific Conference on Communications (APCC), 31 Oct-3 Nov 2010, Auckland, New Zealand.
- Australasian Telecommunication Networks and Applications Conference (ATNAC), 31 Oct-3 Nov 2010, Auckland, New Zealand.
- 35th IEEE Conference on Local Computer Networks (LCN), 11-14 Oct 2010, Denver, Colorado, U.S.A.
- 9th IFIP Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net), June 23-25, 2010, Juan-les-pins, France.
- IEEE International Communications Conference (ICC), 23-27 May 2010, Cape Town, South Africa - Multimedia Communications, Communication Software and Services Symposium.
- 5th International Conference on Mobile Computing and Ubiquitous Networking (ICMU2008), Apr 26-28, 2010, Seattle, WA, USA.
- Australasian Telecommunications Networks and Applications Conference (ATNAC 2009), Nov 9-11, 2009, Canberra, Australia.
- 3rd International Conference on New Technologies, Mobility and Security (NTMS), Dec 20~23, 2009, Cairo, Egypt.
- 4th ACM International Workshop on UnderWater Networks (WUWNet), in conjunction with ACM SenSys 2009, Nov 3, 2009, Berkeley, California, USA.
- 5th International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), Dec 7-10, 2009, Melbourne, Australia.
- 11th International Conference on Distributed Computing and Networking (ICDCN), January 3-6, 2010, Kolkata, India.
- 34th IEEE Conference on Local Computer Networks (LCN2009), 20-23 October 2009, Zurich, Switzerland.
- IADIS Multi Conference on Computer Science and Information Systems 2009, 17 – 23 June 2009, Algarve, Portugal.
- IEEE International Conference on Communications (ICC 2009) - Communications Software and Services Symposium, Jun 14-18, 2009, Dresden, Germany.
- 3rd International Conference on Multimedia and Ubiquitous Engineering (MUE 2009), Jun 4-6, 2009, Qingdao, China.
- Mobile Computing and Applications Track, 24th Annual ACM Symposium on Applied Computing (SAC 2009), March 9 - 12, 2009, Honolulu, Hawaii, USA.
- 15th Annual IEEE International Conference on High Performance Computing (HiPC 2008), Dec 17-20, 2008, Bangalore, India.
- Australasian Telecommunications Networking and Application Conference (ATNAC 2008), Dec 7-10, 2008, Adelaide, Australia.
- 11th IEEE International Conference on Communications Systems (ICCS 2008), Nov 19-21, 2008, Guangzhou, China.
- IEEE International Conference on Systems, Man, and Cybernetics (SMC 2008), Oct 12-15, 2008, Singapore.
- 4th IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob 2008), Oct 12-14, 2008, Avignon, France.
- 2nd International Workshop on Under Water Sensors and Systems (UNWAT 2008), August 25-31, 2008, Cap Esterel, France
- 17th International Conference on Computer Communications and Networks (ICCCN 2008), Wireless Platform: Applications and Testbeds Track, Aug 4-7, 2008, Virgin Islands, USA.
- IADIS International Conference Wireless Applications and Computing (WAC2008), July 22-27, 2008, Amsterdam, The Netherlands.
- 4th International Conference on Mobile Computing and Ubiquitous Networking (ICMU2008), June 11-13, 2008, Tokyo, Japan.
- 5th International Conference on Ubiquitous Intelligence and Computing, June 23-25, 2008, Oslo University College, Oslo, Norway.

- 3rd International Workshop on Performance Analysis and Enhancement of Wireless Networks (PAEWN'08), to be held in conjunction with AINA2008, Mar 25-28, 2008, GinoWan, Okinawa, Japan.
- 2nd International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2008), Mar 4-7, 2008, Technical University of Catalonia, Barcelona, Spain.
- 6th International Conference on Information, Communications and Signal Processing (ICICS 2007), Dec 10-13, 2007, Singapore.
- 15th IEEE International Conference on Networks (ICON2007), Nov 19-21, 2007, Adelaide, Australia.
- 2nd ACM International Workshop on UnderWater NETworks (WUWNET), Sep 14, 2007, held in conjunction with ACM MobiCom/MobiHoc, Montreal, Canada.
- 2nd Asia-Pacific Symposium on Queueing Theory and Network Applications (QTNA2007), Aug 1-4, 2007, Kobe, Japan.
- International Conference on Multimedia and Ubiquitous Engineering (MUE'07), Apr 26-28, 2007, Seoul, Korea.
- International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2007), Apr 10-13, 2007, Vienna, Austria.
- 2nd International Conference on Mobile Ad-hoc and Sensor Networks (MSN'06), Dec 13-15, 2006, Hong Kong, China.
- 10th International Conference on Communication Systems (ICCS2006), Oct 30 - Nov 2, 2006, Singapore.
- 3rd International Conference on Mobile Computing and Ubiquitous Networking (ICMU 2006), Oct 11-13, 2006, Queen Mary University of London, London, U.K.
- International Conference on Networks (ICON2006), Sep 13-15, 2006, Singapore.
- 2nd International Workshop on Performance Modeling and Analysis of Communication in Wired and Wireless Networks (PMAC-2WN'06) held in conjunction with ICPADS'2006, Jul 12-15, 2006, Minneapolis, MN, USA.
- 1st International Workshop on Performance Analysis and Enhancement of Wireless Networks (PAEWN'06) held in conjunction with the IEEE 20th International Conference on Advanced Information Networking and Applications (AINA2006), Apr 18-20, 2006, Vienna, Austria.
- Workshop on Pervasive Computing and Ad Hoc Communications (PCAC'06) held in conjunction with AINA2006, Apr 18-20, 2006, Vienna, Austria.
- IEEE Wireless Communications and Networking Conference (WCNC 2006), 3-6 April 2006, Las Vegas, NV, USA.
- 20th International Conference on Information Network (ICOIN2006), Jan 16-19, 2006, Sendai, Japan.
- 1st International Conference on Mobile Ad-hoc and Sensor Networks (MSN2005), December 13-15, 2005, Wuhan, China.
- 4th IASTED International Conference on Communication Systems & Networks (CSN2005), September 12-14, 2005, Benidorm, Spain.
- International Embedded and Hybrid Systems Conference (IEHSC2005), May 10-13, 2005, Singapore.
- 2nd International Conference on Mobile Computing and Ubiquitous Networking (ICMU 2005), April 13-15, 2005, Osaka, Japan.
- 19th International Conference on Information Network (ICOIN2005), Jan 31-Feb 2, 2005, Jeju, Korea.
- International Conference on Networks (ICON2004), Nov 16-19, 2004, Singapore.
- 9th International Conference on Communication Systems (ICCS2004), Sept 5-8, 2004, Singapore.
- Mobility Conference 2004, Aug 2-4, 2004, Singapore.

Publications

Summary of publications (*peer-reviewed)	#
Journal*	62
Conference*	226
Book (edited) + book chapters	1+9
Patents and (pre-patent) technical disclosures	5+1
H-index (statistics from Google Scholar as of August 9, 2023)	43

Selected/Recent Publications

- [1] Murugaraj Odiathevar, [Winston KG Seah](#) and Marcus Frean, A Bayesian Approach To Distributed Anomaly Detection In Edge AI Networks, *IEEE Transactions on Parallel and Distributed Systems*, vol. 33, no. 12, pp. 3306-3320, 1 Dec. 2022.
- [2] Murugaraj Odiathevar, [Winston KG Seah](#), Marcus Frean and Alvin Valera, An Online Offline Framework for Anomaly Scoring and Detecting New Traffic in Network Streams, *IEEE Transactions on Knowledge and Data Engineering*, 11 January 2021.
- [3] Adrian Pekar, Jozef Moncej, [Winston KG Seah](#) and Iveta Zolotova, Application Domain-based Overview of IoT Network Technologies and Characteristics, *ACM Computing Surveys*, July 2020.
- [4] Liang Yang, Bryan Ng, [Winston KG Seah](#) and Deepak Singh, Performance Evaluation of Equivalent Forwarding Sets in Software Defined Networking, *Journal of Network and Computer Applications*, vol. 153, 1 March 2020.
- [5] Deepak Singh, Bryan Ng, Yuan-Cheng Lai, Ying-Dar Lin and [Winston KG Seah](#), Full Encapsulation or Internal Buffering in OpenFlow based Hardware Switches?, *Computer Networks*, Volume 167, 11 February 2020.
- [6] Alejandra Duque-Torres, Adrian Pekar, [Winston KG Seah](#) and Oscar Mauricio Caicedo Rendon, Heavy-Hitter Flow Identification in Data Centre Networks using Template Matching, *Proceedings of the 44th IEEE Conference on Local Computer Networks (LCN)*, October 14-17, 2019, Osnabrück, Germany. [Best Paper nominee]
- [7] Murugaraj Odiathevar, [Winston KG Seah](#) and Marcus Frean, A Hybrid Online Offline System for Network Anomaly Detection, *Proceedings of the 28th International Conference on Computer Communication and Networks (ICCCN 2019)*, July 29 - August 1, 2019, Valencia, Spain.
- [8] Deepak Singh, Bryan Ng, Yuan-Cheng Lai, Ying-Dar Lin and [Winston KG Seah](#), Analytical Modeling of Software and Hardware Switches with Internal Buffer in Software-Defined Networks, *Journal of Network and Computer Applications*, vol. 136, 15 June 2019, Pages 22-37.
- [9] Deepak Singh, Bryan Ng, Yuan-Cheng Lai, Ying-Dar Lin and [Winston KG Seah](#), Modelling Software-Defined Networking: Software and Hardware Switches, *Journal of Network and Computer Applications*, vol. 122, 15 November 2018, Pages 24-36.
- [10] Q B Guo, Y Zhang, J Lloret, B Kantarci and [Winston KG Seah](#), A Localization Method Avoiding Flip Ambiguities for micro-UAVs with Bounded Distance Measurement Errors, *IEEE Transactions on Mobile Computing*, 17 Aug 2018.
- [11] Hang Yu, Bryan Ng and [Winston KG Seah](#), TTL-based Efficient Forwarding for Nanonetworks with Multiple Coordinated IoT Gateways, *IEEE Internet of Things Journal*, Vol 5, No 3, pp. 1807-1815, June 2018. [IF (2018) = 5.863]
- [12] David C Harrison, [Winston KG Seah](#) and R Rayudu, 'Coverage Preservation with Rapid Forwarding in Energy Harvesting Wireless Sensor Networks for Critical Rare Events,' *ACM Transactions on Embedded Computing Systems*, Special Issue on Autonomous Battery-Free Sensing and Communication, vol. 17, no. 2, December 2017.

- [13] Hang Yu, Bryan Ng and Winston KG Seah, 'On-demand Probabilistic Polling for Nanonetworks under Dynamic IoT Backhaul Network Conditions,' *IEEE IoT Journal*, vol. 4, no. 6, December 2017.
- [14] Normalia Samian and Winston KG Seah, 'Trust-based Scheme for Cheating and Collusion Detection in Wireless Multihop Networks,' *Proc. of the 14th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous)*, 7-10 November 2017, Melbourne, Australia.
- [15] Hang Yu, Bryan Ng and Winston KG Seah, 'Pulse Arrival Scheduling for Nanonetworks under Limited IoT Access Bandwidth,' **Best Paper Award**, *Proc. of the 42nd IEEE Conference on Local Computer Networks (LCN)*, October 9-12, 2017, Singapore.
- [16] Matthew Hayes, Bryan Ng, Adrian Pekar and Winston KG Seah, 'Scalable Architecture for SDN Traffic Classification', *IEEE Systems Journal*, vol. 12, no. 4, December 2018.
- [17] Y. Chen, Bryan Ng, Winston KG Seah and AC Pang, 'Modeling and Analysis: Energy Harvesting in the Internet of Things,' *Proc. of the 19th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, November 13-17, Malta. (Acceptance ratio: 27%)
- [18] Elliott Wen, Winston KG Seah, Bryan Ng, P. Liu and J. Cao, 'UbiTouch: Ubiquitous Smartphone TouchPads using Built-in Proximity and Ambient Light Sensors,' *Proc. of the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)*, 12-16 September 2016, Heidelberg, Germany. (Acceptance ratio: 18%)
- [19] David Harrison, Daniel Burmester, Winston KG Seah and R Rayudu, 'Busting Myths of Energy Models for Wireless Sensor Networks,' *IET Electronics Letters*, vol. 52, no. 16, July/August 2016.
- [20] David Harrison, Winston KG Seah and Ramesh Rayudu, 'Rare Event Detection and Propagation in Wireless Sensor Networks,' *ACM Computing Surveys*, vol. 48, no. 4, March 2016.
- [21] Saurabh Singh, Winston KG Seah and Bryan Ng, 'Cluster-Centric Medium Access Control for WSNs in Structural Health Monitoring,' *Proc. of the 13th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)*, Mumbai, India, 25-29 May 2015.
- [22] Bryan Ng, Matthew Hayes and Winston KG Seah, 'Developing a Traffic Classification Platform for Enterprise Networks with SDN: Experiences & Lessons Learned,' *Proc. of the IFIP Networking 2015*, Toulouse France, 20-22 May 2015.
- [23] D Tomicek, YK Tham, Winston KG Seah and Ramesh Rayudu, 'Vibration-Powered Wireless Sensor for Structural Monitoring During Earthquakes', *Proc. of the 6th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-6)*, Hong Kong, December 9-11, 2013.
- [24] Jonathan P Olds and Winston KG Seah, 'Design of an active radio frequency powered multi-hop wireless sensor network', *Proc. of the 7th IEEE Conference on Industrial Electronics and Applications (ICIEA 2012)*, Singapore, July 18-20, 2012.
- [25] Winston KG Seah, Alvin C Valera, Pius WQ Lee and YF Wong, 'Topology Skewing for Improved Route Selection in Wireless Multi-Hop Networks', **Best Paper Award**, *Proc. of the 45th Hawaii International Conference on System Science (HICSS)*, Maui, HI, USA, Jan 4-7, 2012.
- [26] Pius WQ Lee, Winston KG Seah, HP Tan and ZX Yao, 'Wireless Sensing Without Sensors – An Experimental Study of Motion/Intrusion Detection using RF Irregularity', *Measurement Science and Technology*, Special Issue on Wireless Sensor Networks: designing for real-world deployment and deployment experiences, vol. 21, no. 12, Nov 2010, IOP. [Earlier version: 'Wireless Sensing Without Sensors – An Experimental Approach', *Proc. of the 20th IEEE International Symposium On Personal, Indoor and Mobile Radio Communications (PIMRC)*, September 13-16, 2009, Tokyo, Japan.]

- [27] ZA Eu, HP Tan and Winston KG Seah, 'Design and Performance Analysis of MAC Schemes for Wireless Sensor Networks Powered by Ambient Energy Harvesting', *Ad Hoc Networks*, Volume 9, Issue 3, May 2011, Pages 300-323, Elsevier. [Earlier version: 'A Study of MAC Schemes for Wireless Sensor Networks Powered by Ambient Energy Harvesting', *Proc. of the 4th International Wireless Internet Conference (WICON 2008)*, November 17-19, 2008, Maui, Hawaii, USA.]
- [28] ZA Eu, HP Tan, and Winston KG Seah, 'Opportunistic Routing in Wireless Sensor Networks Powered by Ambient Energy Harvesting', *Computer Networks*, vol. 54, no. 17, 3 December 2010, Pages 2943-2966, Elsevier.
- [29] SK Ng and Winston KG Seah, 'Game-Theoretic Approach for Improving Cooperation in Wireless Multihop Networks', *IEEE Transactions on Systems, Man and Cybernetics – Part B*, vol. 40, no. 3, Pages 559-574, June 2010. (>50 citations as of Aug-23) [Earlier version: SK Ng and Winston KG Seah, 'Game-Theoretic Model for Collaborative Protocols in Selfish, Tariff-Free, Multihop Wireless Networks', *Proc. of IEEE INFOCOM 2008*, April 13-19, 2008, Phoenix, AZ, USA. (AR: 236/1152 \approx 20.5%)]
- [30] Winston KG Seah, ZA Eu and HP Tan, 'Wireless Sensor Networks Powered by Ambient Energy Harvesting – Survey and Challenges', **Invited Paper**, Special Session on Energy Harvesting Wireless Sensor Networks, *Proc. of the 1st International Conference on Wireless Communications, Vehicular Technology, Information Theory and Aerospace & Electronic Systems Technology (Wireless VITAE)*, May 17-20, 2009, Aalborg Congress and Culture Centre, Aalborg, Denmark. (>500 citations as of Aug-23)
- [31] HP Tan, A Gabor, Winston KG Seah and Pius WQ Lee, 'Performance Analysis of Data Delivery Schemes for a Multi-sink Wireless Sensor Network', **Highly Commended Paper Award**, *Proc. of the IEEE 22nd International Conference on Advanced Information Networking and Applications (AINA2008)*, March 25-28, 2008, GinoWan, Okinawa, Japan. (AR: 145/469 < 31%).
- [32] II Er and Winston KG Seah, 'Performance Analysis of Mobility-Based d-Hop (MobDHop) Clustering Algorithm for Mobile Ad Hoc Networks', *Computer Networks*, vol. 50, no. 17, Pages 3375-3399, December 2006. (Earlier version, appeared in WCNC2004, has >200 citations as of Aug-23.)
- [33] VR Chandrasekhar, Winston KG Seah, YS Choo and HV Ee, 'Localization in Underwater Sensor Networks – Survey and Challenges', *Proc. of the 1st ACM International Workshop on UnderWater Networks (WUWNet)*, in conjunction with ACM MobiCom 2006, Sep. 25, 2006, Los Angeles, California, USA. (>400 citations as of Aug-23)
- [34] MQ Xue, II Er and Winston KG Seah, 'An Analysis on Clustering and Routing Overhead for Clustered Mobile Ad Hoc Networks', *Proc. of the 26th International Conference on Distributed Computing Systems (ICDCS 2006)*, July 4-7, 2006, Lisboa, Portugal. (AR: 75/540 \approx 13.8%)
- [35] Winston KG Seah and HX Tan, 'Multipath Virtual Sink Architecture for underwater sensor networks', *Proc. of the MTS/IEEE OCEANS2006 Asia Pacific*, May 16-19, 2006, Singapore. (>130 citations as of Aug-23)
- [36] II Er and Winston KG Seah, 'Clustering Overhead and Convergence Time Analysis of the Mobility-based Multi-Hop Clustering Algorithm for Mobile Ad Hoc Networks', *Journal of Computer and System Sciences*, Elsevier, vol. 72, no. 7, Pages 1144-1155, November 2006.
- [37] CY Cho, Winston KG Seah and YH Chew, 'A Framework and Source Model for Design and Evaluation of Robust Header Compression Performance', *Computer Networks*, vol. 50, no. 15, pp. 2676-2712, October 2006.
- [38] AC Valera, Winston KG Seah and SV Rao, 'Improving Protocol Robustness in Ad hoc Networks Through Cooperative Packet Caching and Shortest Multipath Routing', *IEEE Transactions on Mobile Computing*, vol. 4, no. 5, Pages 443-457, September/October 2005. (Earlier version, appeared in INFOCOM2003, has been cited >240 times.)

- [39] LQ Yang, Winston KG Seah and Q Yin, 'Improving Fairness among TCP Flows crossing Wireless Ad Hoc and Wired Networks', *Proc. of 4th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 2003)*, June 1-3, 2003. (AR: 15%; 100 citations as of Aug-23)
- [40] H Xiao, Winston KG Seah, A Lo and KC Chua, 'A Flexible Quality of Service Model for Mobile Ad Hoc Networks'. *Proc. of IEEE Vehicular Technology Conference (VTC2000-Spring)*, 15-18 May 2000, Tokyo, Japan, pp445-449 (>550 citations as of Aug-23).

Patents and Technical Disclosures

1. YS Liaw, KM Chan, S Kumar, J Liew and Winston KG Seah, 'Method and device for L2TP reconnection handling', Patent filed: DE200110111493, 09 Mar 2001, published: WO02073932A1, 19 Sep 2002.
2. Winston KG Seah, YF Wong, Alvin C Valera and Pius WQ Lee, 'Delta-Delay Scheme for Wireless Routing and Communications', I²R Technical Disclosure No TD2007070, Feb 2008.
3. Winston KG Seah, Daniel Tomicek and Ramesh Rayudu, Provisional Patent NZ 612384, entitled "STRUCTURAL MONITORING", 24 June 2013 – A self powered wireless sensor for monitoring the levels of vibration and stress that buildings suffered during an earthquake.
4. Jonathan P Olds, Winston KG Seah and Ramesh Rayudu, Provisional Patent NZ 719310, entitled "Algorithm for GPS-based Energy Harvesting Operated Relative Positioning", 22 April 2016.
5. Winston KG Seah, Andrew Thompson, and Alvin Valera, Method for selecting access point for wireless connection, AU-2020901987-A0 (2/07/20).
6. Jonathan P Olds, Winston KG Seah and Ramesh Rayudu, "Method and system for monitoring land deformation," US11163070B2 (2021-11-02); NZ747152A (2022-01-28); TW201802492A (2018-01-16); PCT WO2017183005A1 (2017-10-26).
7. Murugaraj Odiathevar, Winston KG Seah, Marcus Freen, and Alvin Valera, Hybrid Machine Learning System and Method, AU-2019900788-A0 (28/03/2019); WO-2020185101-A9 (14/01/2021).