## **Hwee-Pink TAN**

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Associate Professor of Information Systems (Practice), and Academic Director, SMU-TCS iCity Lab, Singapore Management University, 80 Stamford Road, Singapore 178902.

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## **EDUCATION**

Ph.D., Electrical Engineering, Technion, Israel Institute of Technology, September 2004. Thesis: *Quality of Service (QoS) Provisioning in Wireless Networks*. Advisors: Prof. Raphael Rom and Prof. Moshe Sidi.

Master of Science, Electrical Engineering (EE), with major in Wireless Communications, National University of Singapore (NUS), June 2000. Dissertation: TCP/IP performance of EDGE/EGPRS. Advisors: Dr. Anthony Lo and Dr. Winston Seah.

Bachelor of Engineering (EE) with First Class Honours, NUS, June 1994. Final year dissertation: *Second Generation Image Coding using Wavelets*. Advisor: Dr. Surrendra Ranganath.

#### POST-DOCTORAL RESEARCH EXPERIENCE

## Associate Professor of Information Systems (Practice), Academic Director, SMU-TCS iCity Lab, School of Information Systems, Singapore Management University, 03/2015 -

In this role, I currently lead a team of 10 research assistants, engineers and scientists to conduct cross-disciplinary research and development on the design, evaluation and implementation and integration of Internet-of-Things technologies and socio-behavioral studies towards more intelligent and inclusive societies. Ongoing/completed projects include:

- (i) Making SMART Cities for All, SMU Societal Challenge Capacity Building Fund, in collaboration with Paulin Straughan, Lily Kong and Orlando Woods, 07/18-06/19 (Role: Lead PI)
- (ii) Smart Accessibility & Mobility for Barrier-free Access (SGEnable Enabling Lives Grant, in collaboration with Hwee-Xian Tan (SMU), Huiguang Liang and Victor Tong (Trampolene)), 01/18-06/19 (Role: Co-PI)
- (iii) SHINESeniors (funded by MND L2-NIC, in collaboration with A\*STAR, EHA, HDB, URA, GoodLife!), 03/15 06/18 (Role: PI)
- (iv) In-Home Sensors for Assessment of Cognitive and Psychological Health of Older Adults: A Pilot Study (funded by NUH and SMU) 10/16 04/18 (Role: Co-PI)
- (v) A Study of Elderly Living Patterns through Continuous Monitoring and Assessment (MoE AcRF Tier-1, in collaboration with Hwee-Xian Tan (SMU) and Chey Chor Khoon (Lions Befrienders Service Association), 09/15-09/17 (Role: PI)

I am also teaching a new Information Systems Elective, Internet of Things: Technology and Applications starting Term 1, AY2015/16. In AY16 Term 2, I started teaching a similar module as an elective to students on the MITB programme. More information about this module, including student projects, can be found <a href="here">here</a>.

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

Scientific outcomes: [C15-1], [C16-1,2,3,6], [C17-1,2,3,4], [C18-1,2], [B5-6]

## SERC Programme Manager / Senior Scientist II (S&S), I<sup>2</sup>R, 03/2012 –03/2015

In May 2011, I was tasked to initiate a multi-million dollar A\*STAR research programme, Sense and Sense-abilities, with the vision of unifying large-scale and heterogeneous sensing to realize Smart Cities. Since its inauguration in August 2012, I managed to grow the team from 10 to today's 30 research scientist, engineers and graduate students. Ongoing Projects (as Principal Investigator / Co-Investigator) include:

- (i) Urban Sensing for Ads Networks (funded by French ICT Asia Program, in collaboration with TSP, Fujen Catholic University, IFI Vietnam and INRIA), 06/13 03/15
- (ii) A Wireless Sensor Network for Real-time and Continuous Ambient Noise Mapping (funded by NEA), 09/12 – 09/14
- (iii) Generalized Participatory Sensing (funded by A\*STAR), 08/13 03/15
- (iv) A Dense, Rural and Large Scale Deployment of S&S Technologies for Vertical Farming (funded by A\*STAR, in collaboration with Sky Greens Pte Ltd), 04/13 10/14
- (v) A Unified and Sustainable Sensing and Transport Architecture for Large Scale and Heterogeneous Sensor Networks (funded by A\*STAR), 05/12 03/15

**Scientific outcomes**: [C12-1,..,8], [C13-1,..,5], [C14-1,..,9], [C15-1,2,...,5],[J12-1,2], [J13-1,..4], [J14-1,..7], [J15-1,2,...,5], [J16-1,2,3,4], [J17-1,2]

# Scientist II – Senior Scientist I (Networking Protocols Department), I<sup>2</sup>R, Singapore [03/2008 – 03/2012]

I was appointed Research Group Leader (Algorithms and Modeling), leading a group of 10 researchers. During this period, I led (as Principal Investigator/Co-investigator) and completed the following projects:

- (i) Underwater Networks for Intelligent Deepwater Mooring Systems (funded by A\*STAR, in collaboration with NUS), 03/2008 08/2011
- (ii) MANET and Mesh Interconnectivity in Vehicular Ad hoc Networks (funded by French ICT Asia Program, in collaboration with Telecom Sud Paris, NTU (Singapore), Fujen Catholic University (Taiwan), IIT-Bombay (India), Osaka University (Japan)), 01/2009 12/2010.
- (iii) Robust Underwater Multihop Network to support Long Range Sensing Applications (funded by NUS), 04/2009 04/2012
- (iv) Exploiting Ambient Energy Harvesting and Multi-hop Wireless Technology for Open Car Park Monitoring (funded by A\*STAR A\*CAR program, in collaboration with SysEng(S) Pte Ltd), 11/2010 11/2012
- (v) Cross Layer Protocols for Multi-hop Underwater Networking using advanced features of Evologics hydroacoustic modems (in collaboration with Evologics GmbH), 09/2010-03/2012.

Scientific Outcomes: [C08-4,5], [C09-1,...,7], [C10-1,...,10], [C11-1,...,8], [J10-1,2], [J11-1,2]

## Research Fellow, CTVR, Trinity College Dublin, Ireland [07/2006 – 03/2008]

I was appointed Research fellow, working with Prof. Linda Doyle (Trinity College Dublin) to study spectrum sharing etiquettes in cognitive radio networks under the PLASTIC project, funded by Science Foundation Ireland and National Development Plan. My collaborators for this study include Dr. Joe Bater and Dr. Kenneth N. Brown (Cork Constraint Computation Center, UCC).

Concurrently, I was also involved in collaborative research with Dr. Winston Seah (I<sup>2</sup>R, Singapore) and Dr. Adriana Gabor (Erasmus University Rotterdam) on the study of advanced communication protocols for underwater acoustic networks.

I also led and coordinated the submission of a research proposal in response to FP7 Joint call on ICT and Security Themes for Critical Infrastructure Protection ICT-SEC-2007.1.7, jointly with TUDelft, I<sup>2</sup>R, SINTEF and CWI. Although the project was not funded, we achieved a good score of 12/15.

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

**Scientific outcomes**: [C07-1,2,3,4], [C08-1,2]

## Postdoctoral Researcher, EURANDOM, Eindhoven University of Technology, The Netherlands [12/2004 – 06/2006]

I was appointed principal investigator, working with Prof. Onno Boxma (Technical University of Eindhoven), Prof. Rudesindo Nunez-Queija (CWI) and Dr. Adriana Gabor (EURANDOM) in a joint-project funded by Vodafone. Using time-scale decomposition, we developed approximations to evaluate the performance of an admission control strategy for integrated services in a single UMTS cell.

**Scientific outcomes**: [C05], [C06-2,3,5], [J09-1]

### Visiting Researcher, University of Ferrara, Italy [09/2004 – 10/2004]

I was hosted by Prof. Michele Zorzi (University of Padova) as a visiting researcher to work with Dr. Daniele Miorandi (CREATE-NET) to study the problem of scheduling in Ad-Hoc Networks. I conducted extensive survey of existing literature, and devised possible work items in the area of topology-transparent scheduling in Ad-Hoc networks.

Scientific outcome: [C06-1]

#### PRE-DOCTORAL RESEARCH EXPERIENCE

#### Ph.D. student, Technion, 10/2000 – 09/2004

Under the supervision of Prof. Raphael Rom and Prof. Moshe Sidi, I developed stochastic models for channel-aware wireless schedulers operating in Markov channel models. I also proposed a performance analysis framework to study the trade-offs amongst various QoS metrics such as throughput, delay, fairness and wireless receiver buffer requirement as a function of input flow and channel parameters. I conceived a novel idea of exploiting long-term channel effects in additional to the instantaneous channel state in the wireless scheduler design.

**Scientific outcomes**: [C03], [C04-1,2,3], [J04-1], [J06-1], [J09-2]

### Summer Intern, Institute for Infocomm Research, Singapore, 07/2003 to 09/2003

Under the supervision of Dr. Q. H. Yin and Dr. Winston Seah, I devised the optimization criteria and developed performance analysis tools to evaluate the periodicity properties of weighted-time division cyclic schedulers.

## Masters Student, Center for Wireless Communications, NUS, 07/1996 – 06/2000

Under the supervision of Dr. Anthony Lo and Dr. Winston Seah, I simulated a 2.5G EDGE/EGPRS network using the Network Simulator tool and investigated the TCP performance of such a network for various channel-aware link layer enhancement protocols.

Scientific outcome: [C00-2], [C06-4]

## Senior Member of Technical Staff, DSO National Laboratories, Singapore, 06/1995 to 06/2000

- Project Leader / Principal Investigator in R&D projects focused on development of new techniques and algorithms in the area of image and signal processing for radar systems
- System administrator responsible for the maintenance of UNIX workstations
- Appointed Resident Project Officer / System Engineer (Overseas attachment for the period May 97 July 98) in charge of all technical and managerial liaisons between collaborating parties
- Presented technical papers at DSO monthly technical talk (1996) and Radar Seminar (1997)
- Scientific outcomes: [C99], [C00-1]

## Industrial Trainee, Institute of Systems Science, Singapore (ISS), 01/1992 – 06/1992

• Under the supervision of Dr. Kent Tseng and Mr K. S. Lim, I developed a simulation program in C++ to emulate an ATM network in order to study its performance.

## Undergraduate student, EE Department, NUS, 07/1993 – 06/1994

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

Under the supervision of Dr. Surendra Ranganath, I investigated image compression techniques using wavelets. Implemented wavelet-based coders and decoders in C and performed simulations to study tradeoffs between image quality and achievable compression ratio.

## CURRENT Ph.D. / M.Sc / MITB STUDENT SUPERVISION / MENTORSHIP

- 1. Mr. Austin Zhang Yi (SMU MITB Capstone Project), 12/2015-12/2017
- 2. Mr. Teh Seng Khoon (SMU MITB Capstone Project), 6/2016-12/2017
- 3. Mr. Lyonel Cha (SMU), 8/2017-
- 4. Ms. Nina Hoang (SMU), 8/2018-

### SMU UNDERGRADUATE CAPSTONE PROJECT SPONSORSHIP

- 1. <u>Team Gemini</u> (Mohamed Afiq Bin Mohamed Ismail, Shawn Lau, Dennis Ang and Josie Kiew), 4-12/2016 (with Dr. Tan Hwee Xian) (**Winner of Best Video Award**)
- 2. <u>Team HumbleBees</u> (Chia Chek Wei, Lewis Poh, Au Wai Loong, Louis Tan, Tan Kah Sheng and Tang Shing Hei), 4-12/2016 (with Dr. Tan Hwee Xian)
- 3. <u>Team Tetris</u> (Whey Zhen Hui, Elliotz Kamarulzaman Thiara, Muhammad Irshad Bin Mohamed Salleh, Avinash Dash, Samantha Ng and Tan Wei Liang), 10/2016 4/2017 (with Mr Andus Lim and Dr. Tan Hwee Xian)
- 4. <u>Team Florify</u> (Mohammed Zulfiquer Pathan, Amanda Tan, Nicholas Franslay, Boh Yong Ren, Leonard Chua and Wilson Lim), 4-12/2017 (with Dr. Tan Hwee Xian and Mr Ng Boon Thai)
- 5. <u>Team Alpha</u> (Chai Hui Yee, Aloysius Lim, Koh Hong Ye, Tan Jun Ming, Jeremy Tay and Carine Ng), 10/2017 4/2018 (with Dr Henry Ho, Head of Urology Department, SGH)
- Team XWGate (Goh Jin Qiang, Celestine Kho, Derrick Lee, Sherman Koa and Sushia MORE), 10/2017

  4/2018
- 7. <u>Team Zenith</u> (Amelia Lee, Chew Chin Rui, Ervin Chong, Huang Mingrui, Ricky Franslay and Wang Qimin), 10/2017 4/2018 (with Mr Ng Boon Thai)

#### SMU UNDERGRADUATE CAPSTONE PROJECT SUPERVISION

- Team Internet Explorers (Shaun Teo, Jed Tan, Amanda Teo, Aldric Bek, Patrick Lim and David Liu), 5-12/18
- 2. <u>Team UUUU</u> (Xia Xiaoyi, Li Weiqiao, Chen Yuge and Peng Zifu), 5-12/18
- 3. <u>Team S.H.I.E.L.D</u> (Gan Shenying, Ragini Verma, Shi Jianrong, Ker Wei Xiang, Stephanie Toh and Teo Wei Song), 5-12/18
- 4. <u>Team Ctrl Alt Del</u> (N. Syafiqah Said, Jiwen Yang, Nur Syakirah Said, Edbert Pang, Dean Ko and Jerome Dyoe), 5-12/2017
- 5. Team Firestorm (Han Zhong Tan, Adeline Jong, Gina Lee, Raynie Moo and Yuchun Wang), 5-12/2017
- 6. <u>Team Scooters</u> (Daniel Lim, Fan Wei Lun, Tan Jin An, Royston Liang, Ega Tandian and Chong Jia Qian), 5-12/2017 (**Winner of Best Video and Infosys Consulting Award**)
- 7. Team SJ-LAY (Alton Foo, Huang Xiping, Lucas Leong, Jasmine Tan and Yvonne Liew), 5-12/2017

## PROFESSIONAL AFFILIATIONS / ACTIVITIES / EXTERNAL APPOINTMENTS / CONTRIBUTIONS

## **Professional Contributions**

Developer, Recognition of Prior Learning, FinTech Mapping, Theme on IoT, SMU Academy, Sep 2017 – Jan 2018

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

Instructor, "Creating and Extracting Value through Big Data Analytics", CSC-SMU Executive Programme on Innovation For Leaders, 28 Sep 2017

The Internet of Things, Ethically Speaking, The SMU Blog, 19 May 2017

Member of Judging Panel, <u>Innovation Design Engineering Championships</u>, March 2017, 2018

Smart Homes Enhance Seniors' Safety, Asia Research News 2017, February 2017

<u>Connecting Capabilities: The Asian Digital Transformation Index, A report from the Economist Intelligence Unit, 22 November 2016</u>

<u>Technology to be biggest enabler for Singapore going forward, SAS Analytics Insights e-Roundtable</u> (Moderator: Amit Roy Choudhury, The Business Times), 3 October 2016

Action Plan for Successful Ageing, Ministerial Committee on Ageing, February 2016

## **External appointments / affiliations**

Member, Ministry of Education Translational and Innovation Fund Expert Panel (Sep 2018 – )

Academic Editor, Wireless Communications and Mobile Computing (Impact factor: 1.899) (May 2018 - )

Member, Technical Committee on IT for the Elderly, IT Standards Committee (Nov 2017 – )

Adjunct faculty, Geriatrics Education and Research Institute (May 2017 - )

Co-founder/Director/Chair, Technology and Innovation Committee, Stroke Support Station (Feb 2015 - )

Chair, A\*STAR's Science and Engineering Research Council (SERC) Futurescape 2025 Panel on Semantic Web of Everything (Apr 2014 – Sep 2014)

Deputy Chair, Information Technology Standards Committee (ITSC) Internet of Things (IoT) Committee (July 2014 – March 2015)

Area Editor for Elsevier Journal of Computer Networks (January 2015- June 2016)

Senior Member, Institute of Electrical and Electronics Engineers (IEEE) (Mar 2014 - )

Expert Technical Evaluator: Singapore Ministry of Education Translational R&D and Innovation Fund Grant Call 2017, Land & Live-ability National Innovation Challenge (L2-NIC 2014), Technology Foundation STW (Dutch funding agency for academic research) 2014

## **Conference/Workshop Organization**

- 1. General Co-chair, IEEE ISSNIP 2014, 2015
- 2. Conference Programme Committee Chair, IoT Asia 2014
- 3. Poster Co-chair, IEEE SECON 2014
- 4. Workshop Co-chair, ICDCN 2016
- 5. Co-Chair, PASTA, collocated workshop with IEEE PERCOM 2016
- 6. Co-Chair, IoT of Health, collocated workshop with ACM Mobisys 2016
- 7. Publicity Co-chair, IEEE LCN 2016

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- 8. TPC Co-Chair, Network Applications track, ACM QTNA 2016
- 9. Local Arrangement Chair, IEEE LCN 2017
- TPC Co-Chair, IRC Conference on Science, Engineering and Technology (IRC-SET), 11-12 August 2017
- 11. Programme Committee, 4<sup>th</sup> International Conference on Human Aspects of IT for the Aged Population (ITAP), July 2018
- 12. Workshops Chair, IEEE LCN 2018

## HONOURS AND AWARDS

Nominee, SMU Undergraduate Most Promising Teacher Award	June 2018
Best Paper Award, The 3 <sup>rd</sup> International Conference on Human Aspects of IT for the Aged Population, HCII	July 2017
The Most Outstanding Contribution to Social Behavioral Research to Enable Sustainable Ageing in Place in the World in 2016, Global Awards 2016	Nov 2016
Finalist, Smart City Expo World Congress, Project Category	Nov 2014
A*STAR Sponsorship (Part-time MBA)	Aug 2014
I <sup>2</sup> R Long Service Award (5 years)	May 2014
A*STAR Most Inspiring Mentor Award	Apr 2014
A*STAR's The Award for Leading, Educating & Nurturing Talent (TALENT)	Apr 2014
A*STAR Borderless Award	Apr 2014
I <sup>2</sup> R Role Model Award FY 2012	Apr 2013
Best Paper Award, ICTC	Oct 2012
I <sup>2</sup> R Role Model Award FY 2011	Apr 2012
I <sup>2</sup> R Excellent Team Player Award 2010	Apr 2011
I <sup>2</sup> R Good Team Player Award 2009	Apr 2010
I <sup>2</sup> R Best Paper Award 2009	Mar 2009
Highly Commended Paper Award, IEEE AINA	Mar 2008
A*STAR(NSS) International Fellowship, A-STAR, Singapore	Dec 2004 - Feb 2008
Faculty Scholarship, Technion, Israel Institute of Technology	Oct 2001 - Sep 2004
Lady Davis Fellowship, Technion, Israel Institute of Technology	Oct 2000 - Sep 2001
Dean's List, National University of Singapore	1993/94
Local Merit Scholarship, Public Service Commission, Singapore	1990 - 1994

## INVITED TALKS / SEMINARS / WEBINARS / LECTURES

<sup>&</sup>quot;Smart and Sustainable Community Care for Ageing-in-Place", TeSA Health Tech Day, SMU Labs, 16 March 2018

<sup>&</sup>quot;Smart and Sustainable Community Care for the Elderly", Ben Gurion University of the Negev, 26 Feb 2018, Israel

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- "Smart and Sustainable Community Care for the Elderly", Hwee-Pink Tan and Steven Miller, Partner Keynote, TCS Japan Summit, 1 November 2017, Tokyo
- "Real-World Large-Scale IoT Systems for Ageing-in-Place: Experiences and Lessons Learnt", IEEE 12<sup>th</sup> International Workshop on Practical Issues in Building Sensor Network Applications (IEEE SenseApp 2017), Keynote, 9 Oct 2017, Singapore
- "Graceful Ageing-In-Place: Leveraging Technologies for Holistic and Personalized Care", Innovating Care Asia Pacific 2017, 30 Sep 1 Oct 2017, Kuala Lumpur
- "Enabling Ageing-in-Place with IoT: Our Experiences on the Ground", Innosparks Open House Event, 29 June 2017
- "IoT-Enabled Community Care for Sustainable Ageing-in-Place", IBC Digital Healthcare Summit, Singapore, 25 May 2017
- "IoT-Enabled Community Care for Sustainable Ageing-in-Place", SMU-Hitotsubashi Webinar on Ageing and healthcare economics and management, 19 May 2017
- "IoT Sustaining and Enabling Ageing in Place", Thought Leadership Webinar, HIMSS Asia Pacific, 30 March 2017
- "IoT-Enabled Community Care Provisioning for Sustainable Ageing-in-Place", Invited Talk at IoT China Business Forum, Chengdu, 23 Nov 2016
- "IoT-Enabled Community Care Provisioning for Sustainable Ageing-in-Place", Invited Talk at Retirement Living and Senior Care Southeast Asia, 28 Sep 2016
- "IoT-Enabled Community Care Provisioning for Sustainable Ageing-in-Place", Invited Talk at Technion Computer Engineering Centre, 4 May 2016
- "IoT-Enabled Care Provisioning for Sustainable Ageing-in-Place", Invited Talk at BIGIT Technology, Singapore, 23 Mar 2016
- "IoT-Enabled Care Provisioning for Sustainable Ageing-in-Place", Invited Talk at Indonesia OpenGov Leadership Forum, Jakarta, 25 Feb 2016
- "Smart Cities The Imminent Future", Invited Talk at TCS Sangam, Kochi, 19 December 2015
- "IoT-Enabled Care Provisioning for Sustainable Ageing-in-Place", Invited Talk at IoT Meetup on IoT in Healthcare, 17 December 2015
- "Integration of Ambient Intelligence with Care Provisioning for Sustainable Ageing-in-Place: A Singapore Example", Invited Talk at 2015 Singapore-Sweden Excellence Seminar on "Ageing Societies and Innovative Ideas", NUS Yong Loo Lin School of Medicine, 4 November 2015.
- "Integration of Ambient Intelligence and Care Provisioning for Sustainable Aging-in-Place: A Singapore Example", Invited Talk at CONNECT Centre, Trinity College Dublin, Ireland, 31 July 2015
- "Sense and Sense-abilities: A Unified Architecture for Large-Scale and Heterogeneous Sensing/Sense-making to support Smart Nation Applications", Invited Talk at HPC Symposium, Computing Solutions for Industry, Singapore, 22 August 2014.
- "Deploying Cost-Effective Wireless Sensor Systems", Invited Talk at  $20^{th}$  I²R Infocomm and Media Horizons, Singapore, 9 October 2013.

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- "A Sensing and Sense-Making Framework to Unify Government-Centric Smart City Applications in Singapore", Invited Talk at 10<sup>th</sup> IEEE APWCS, 22-23 August 2013, Seoul.
- "A Sensing and Sense-Making Framework to Unify Government-Centric Smart City Applications in Singapore", Invited Talk at International Session: Promoting mutual interested cooperation elements, IoT-Week, 17-20 June 2013, Helsinki.
- "Connecting Government Centric Applications through a Unified Sensing and Sense-making Architecture", Invited Talk at 8<sup>th</sup> IEEE International Conference of Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), 2-5 April 2013, Melbourne.
- "Connecting Government Centric Applications through Sense and Sense-abilities", Invited Talk at Smart Connected Devices Asia Conference, 20-21 November 2012, Singapore.
- "Towards Smarter Cities with Sense and Sense-abilities", Invited Talk at <u>International Workshop on Trends and Challenges of Networking</u>, Technion, Israel, 31 October 2012.
- "Towards Smarter Cities with Sense and Sense-abilities", Invited Talk at 15<sup>th</sup> GITEX Forum, Singapore, 15 October 2012.
- "Enabling M2M Communications in Energy Harvesting Wireless Sensor Networks (EHWSN) for Sustainable Monitoring", Invited Talk at 18<sup>th</sup> I<sup>2</sup>R Infocomm and Media Horizons, Singapore, 24 August 2011.
- "A Survey of Recent Techniques and Challenges in Underwater Localization", Invited Talk at High Speed Intelligent Communication (HSIC) Forum, Nanyang Technological University, Singapore, 13 May 2010.
- "Robust Data Delivery over Energy Harvesting and Underwater Wireless Sensor Networks", Seminar at 3<sup>rd</sup> A\*STAR NKTH Symposium on Systems Biology and Communication Systems, Pazmany Peter Catholic University, Budapest, Hungary, 30 March 2010.
- "An Interference Temperature Constraints Model for Spectrum Access in Cognitive Radio Networks", Seminar at Institute for Infocomm Research, Singapore, 4 July 2007.
- "FM Modulation", Guess lecturer for third year course 3C5 (Telecommunications), TCD, April 2007.
- "Wireless Ad Hoc Networks", Guest lecturer for final year course 4E1 (Management for Engineers), TCD, 5-6 February 2007.
- "Admission Control for Integrated Services in UMTS", CWI Queuing Colloqium, 22 June 2006.

## MEDIA MENTIONS / APPEARANCES

- "Employing In-Home Sensor Technology to explore Elderly's Social Needs", AI Singapore e-Magazine, 5 Feb 2018
- "Out of Hospital and Into the Home: Ageing Transformed Through Tech", The SMU Blog, 12 Jan 2018
- "Sensors keep close eye on seniors who live alone", The Straits Times, 9 Jan 2018
- Speech by Minister of Education at the MOE Start Award Ceremony, 26 July 2017
- "The Internet of Things, Ethically Speaking", The SMU Blog, 17 May 2017

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

'Telerehab' system allows patients to do physiotherapy at home, The Straits Times, 5 May 2017

Seniors who live alone risk social isolation, The Straits Times, 2 May 2017

Smart homes enhance seniors' safety Medical Xpress, 9 August 2016

Using data to keep a closer eye on seniors, The Straits Times, 8 August 2016

Eldercare: More home and daycare services, The Straits Times, 5 June 2016

<u>Leadership Innovation using IoT and Big Data Analytics by Gen Y in Singapore for the elderly, Singapore OpenGov Leadership Forum, 22 May 2016</u>

Keeping tabs on seniors' safety, The Straits Times, 22 April 2016

SMU students tap Internet-of-things to track symptoms of depression in the elderly, Lianhe Zaobao, page 13, 15 April 2016

Students tap Internet of Things to solve everyday problems, Today online, 14 April 2016

App to help visually disabled find their way part of tech showcase with a community focus, The Straits Times, 14 April 2016

Dr. Tan discusses how a variety of IoT devices will assist in caring for the Ageing-in-Place, 3 Feb 2016

Integrated approach to ageing in place, Straits Times Science Talk, 15 Jan 2016

OpenGov Speaks to Dr. Tan Hwee Pink about SMU-TCS iCity Lab, By Jacqueline Kelleher, 12 October 2015

"Internet of Things" courses at Tertiary Institutions to develop talents in intelligent systems design, Lianhe Zaobao, 17 June 2015

Sky Greens Opening My Paper Article, 24 October 2012

World Cities Summit / National Day Parade 2012 Straits Times, 10 July 2012

World Cities Summit Channel 8 Clip, 08 July 2012

Business Times: "Exhibitors strut their stuff at CommunicAsia", 27 June 2011

ZDNet Asia: "A\*Star, NTT DoCoMo demo new tech", 24 June 2011

联合早报: 新科技登场亚洲通讯展, 22 June 2011

Channel 8 News: "Interview of Dr. Hwee-Pink Tan, together with a brief description of the Easypark system", 20 June 2011

Languages (Written / Spoken)	Competency Level
English	Excellent
Mandarin	Excellent
Hebrew	Intermediate
Japanese	Basic
Dutch	Basic

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

### **COMPUTING SKILLS**

Matlab, C and C++ programming, Microsoft Office, Latex-based Word Processing, Unix OS, Network Simulator *ns*-2

## REFERENCES

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Further information regarding my research interests and detailed transcripts are available in the Annexes or at my personal webpage: <a href="http://mysmu.edu.sg/faculty/hptan/">http://mysmu.edu.sg/faculty/hptan/</a>.

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## **ANNEX-1: PEER-REVIEWED PUBLICATIONS (Appeared and In-press\*)**

## **Book Chapters:**

- [B6] N. Goonawardene, Pius Lee, Hwee-Xian Tan, Alvin Valera and **H. P. Tan**, "Technologies for Ageing-in-Place: The Singapore Context", Living in Smart Cities, World Scientific, January 2018
- [B5] A. Valera, P. Lee, **H. P. Tan**, H. X. Tan and H. Liang, "Real World, Large Scale IoT Systems for Community Eldercare: Experiences and Lessons Learned", Elderly Care: Options, Challenges and Trends, Nova Publishers, Q2, 2018
- [B4] F. J. Wu, T. Luo and **H. P. Tan**, "Case studies of WSN-CPS applications", Cyber-Physical Systems Design with Sensor Networking Technologies, Edited by S. Zeadally and N. Jabeur, London, UK: IET Press, November 2015
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- [C08-3] **H. P. Tan**, C. O'Sullivan and W. Seah, "Interference Management for Medium Access Control in CDMA Underwater Acoustic Sensor Networks", Proc. of the 67<sup>th</sup> IEEE VTC, pp 2116-2120, May 2008 [Acceptance ratio = 40%].
- [C08-2] **H. P. Tan**, W. Seah and L. Doyle, "Exploring Cognitive Techniques for Bandwidth Management in Integrated Underwater Acoustic Systems", Proc. of the IEEE/MTS Oceans Kobe, April 2008.
- [C08-1] **H. P. Tan**, A. F. Gabor, W. Seah and P. Lee, "Performance Analysis of Data Delivery Schemes for a Multi-sink Wireless Sensor Network", Proc. of the 22<sup>nd</sup> IEEE AINA, pp 418-425, March 2008 (*Highly Commended Paper Award*) [Acceptance ratio = 147/469, 31%].
- [C07-4] J. Bater, **H. P. Tan**, K. Brown and L. Doyle, "Maximising Access to a Spectrum Commons using Interference Temperature Constraints", Proc. of the Crowncom, August 2007.
- [C07-3] J. Bater, **H. P. Tan**, K. Brown and L. Doyle, "Modelling Interference Temperature Constraints for Spectrum Access in Cognitive Radio Networks", Proc. of the IEEE ICC, pp 6493-6498, June 2007 [Acceptance ratio = 15/42, 36%].
- [C07-2] **H. P. Tan,** W. Seah and L. Doyle, "A Multi-hop ARQ Protocol for an Underwater Acoustic Channel", Proc. of the IEEE OCEANS Europe, pp 1-6, June 2007.
- [C07-1] **H. P. Tan,** C. O'Sullivan and L. Doyle, "FSMA A Topology-Transparent Scheme for Opportunistic Spectrum Access", Proc. of the 65<sup>th</sup> IEEE VTC, pp 2890-2894, April 2007 [Acceptance ratio = 685/1443, 47.4%].
- [C06-5] R. Nunez-Queija and **H. P. Tan**, "Location-based Admission Control for Differentiated Services in 3G cellular networks", Proc. of the  $9^{th}$  ACM-IEEE MSWiM, pp 322-329, October 2006 [Acceptance ratio = 39/160, 24%].
- [C06-4] M. Mamun, M. Rahman and **H. P. Tan**, "Performance Evaluation of TCP over Routing Protocols for Mobile Ad-Hoc Networks", Proc. of 1<sup>st</sup> Chinacom, October 2006.
- [C06-3] Winston K.G. Seah and **H. P. Tan,** "Multipath Virtual Sink Architecture for Wireless Sensor Networks in Harsh Environments", Proc. of the ACM first international conference on Integrated internet ad hoc and sensor networks (Intersense), vol 138, May 2006 [Invited Paper]
- [C06-2] O. J. Boxma, A. F. Gabor, R. Nunez-Queija and **H. P. Tan**, "Performance Analysis of Admission Control for Integrated Services with Minimum Rate Guarantees", Proc. of the 2<sup>nd</sup> Euro-NGI conference, pp 41-47, April 2006 [Acceptance ratio = 32/125, 25.6%].
- [C06-1] D. Miorandi, **H. P. Tan** and M. Zorzi, "Ad Hoc Networks with Topology-Transparent Scheduling Schemes: Scaling Laws and Capacity / Delay Tradeoffs", Proc. of the 4<sup>th</sup> IEEE WiOpt, April 2006 [Acceptance ratio = 42/130, 30 %].

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- [C05] **H. P. Tan**, "Performance Analysis of Wireless Scheduling with ARQ over Fast Fading Channels", LNCS 3552, pp 353-355 (IWQoS), June 2005 [Acceptance ratio = 23+17/120, 30%].
- [C04-3] R. Rom and **H. P. Tan**, "Analysis of Tradeoffs between buffer and QoS requirements in Wireless Networks", Proc. of the 16<sup>th</sup> ITC Specialist Seminar on Performance Evaluation of Wireless and Mobile Systems, pp 65-76, August 2004.
- [C04-2] R. Rom, M. Sidi and **H. P. Tan**, "Performance Analysis of a Recursive Cyclic Scheduler for Class-based Scheduling", Proc. of the 16<sup>th</sup> ITC Specialist Seminar on Performance Evaluation of Wireless and Mobile Systems, pp 43-54, August 2004.
- [C04-1] R. Rom and **H. P. Tan**, "Framework for Performance Analysis of Channel-aware Wireless Schedulers", Proc. of the IEEE IPCCC, pp 153-157, April 2004 [Acceptance ratio = 28%].
- [C03] R. Rom and **H. P. Tan,** "Performance Tradeoffs in Wireless Scheduling with Flow Aggregation", Proc. of the IEEE WCNC, vol 3, pp 1633-1638, March 2003 [Acceptance ratio = 377/730, 52%].
- [C00-2] **H. P. Tan**, A. Lo and W. Seah, "*Performance Evaluation of TCP/IP over EDGE*". Presented at the 10<sup>th</sup> International Conference on Computing and Information, Kuwait, Nov 2000.
- [C00-1] **H. P. Tan** and U. Ramanathan, "Intelligent selection of useful features for optimal feature-based classification". Proc. of the IEEE IGARSS, pp 3012-3014, July 2000.
- [C99] **H. P. Tan** and U.Ramanathan, "Extraction of Height Information from target shadow for applications in ATC". Proc. of the IEEE IGARSS, pp 351-353, July 1999.

#### TECHNICAL REPORTS

- O. J. Boxma, A. F. Gabor, R. Nunez-Queija and **H. P. Tan**, "Admission Control for Differentiated Services in 3G Cellular Networks", Technical Report, EURANDOM, April 2007.
- R. Rom and **H. P. Tan**, "Analysis of Trade-offs between Buffer and QoS Requirement in Wireless Networks", Technical Report, Technion EE publication CCIT #471, Feb 2004.
- R. Rom, M. Sidi and **H. P. Tan**, "Performance Analysis of a Recursive Cyclic Scheduler or Classbased Scheduling", Technical Report, Technion EE publication CCIT #470, Feb 2004.
- R. Rom and **H. P. Tan**, "Framework for Delay Analysis of Channel-aware Wireless Schedulers", Technical Report, Technical Epublication CITT #423, May 2003.
- R. Rom and **H. P. Tan**, "Stochastic Analysis of Symmetric Two-Flow Wireless-Fair Scheduling", Technical Report, Technical Epublication CITT #371, March 2002.

#### ANNEX-2: DETAILS OF PAST SUPERVISORY EXPERIENCE

#### PhD / MSc Co-supervisor

- 1. Dr. Colman O'Sullivan (Trinity College Dublin), 10/2007-03/2008. (Currently Software Developer, G-Research)
- 2. Mr. Deepak Sarath (Trinity College Dublin), 04/2007-03/2008 (Currently Director of Strategy and Business Development, HSEC Services)
- 3. Dr. Eu Zhi Ang (National University of Singapore), 03/2008-04/2011 (Currently Senior Engineer, HDB)
- 4. Mr. Jong-Pil Kim (Kyungpook National University), 02/2009-08/2009
- 5. Mr. Keita Takahashi (Shizuoka University), 07/2009-11/2009
- 6. Mr. Marc Waldmeyer (EPFL), 09/2009-03/2010 (Software Developer chez SBB)

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- 7. Dr. Nicky de Battista (University of Sheffield, jointly with James Brownjohn), 10/2010-12/2013 (Currently Research Associate, University of Cambridge)
- 8. Mr. Fu-Yun Tsuo (National Taiwan University, jointly with Chew Yong Huat), 7/2010-9/2010 (**Software Design Engineer, STMicroelectronics**)
- 9. Mr. Lim Yuncai (National University of Singapore, jointly with Tham Chen Khong), 9/2010-4/2012 (Current Senior DevOps Engineer, Data Spark Pte Ltd)
- 10. Dr Roee Diamant (UBC, jointly with Soh Wee Seng), 10/2011-12/2011 (Currently Assistant Professor, University of Haifa)
- 11. Ms Sanam Shirazi Beheshtiha (Amikabir University of Technology), 01/2012-06/2012 (A\*STAR SIPGA Internship)
- 12. Dr Behnam Dezfouli (University Technology Malaysia, jointly with Chew Yong Huat), 04-09/2012 (Currently Assistant Professor, Santa Clara University)
- 13. Dr Marjan Radi (University Technology Malaysia, jointly with Chew Yong Huat), 04-09/2012. (Currently Postdoctoral Research Scientist, University of Iowa)
- Dr. Alvin Valera (National University of Singapore, jointly with Soh Wee Seng), 8/2010-3/2015 (Currently Research Fellow, SMU-TCS iCity Lab, SMU)
- 15. Dr. Zhang Pengfei (Nanyang Technological University, jointly with Xiao Gaoxi), 8/2010-3/2015 (Currently Principal Researcher, Machine Learning Research Group, Oxford University)
- 16. Dr. Liang Huiguang (CMU, jointly with Yeow Wai Leong and Hyong Kim), 8/2011-3/2015 (Currently Scientist at IHPC, A\*STAR)
- 17. Mr Cheikh Mbacke Thiam (IFI, Vietnam), 11/2013 5/2014 (Engineer, Core Network and Collaboration, Neurotech Senegal)
- 18. Mr Tom van den Berg (University of Twente, NL, jointly with Hwee Xian Tan, I2R), 2/2015 7/2015 (Currently System Development Engineer, Saab)
- 19. Dr Mohammad Abu Alsheikh (Nanyang Technological University, jointly with Dusit Niyato), 1/2013-1/2017 (Currently Postdoc Associate, CSAIL, MIT)
- 20. Mr. Arcchit Mittal (SMU MITB Capstone Project, with Dr Andrew Koh), 6/2016-12/2016 (Manager, OxfordCaps)
- 21. Mr Lorin Schoop, Philip Charles Z, Florian Andes, Shantanu Shah and Yinchao Li (SMU Master of Innovation Final Capstone Project), 3-6/2016

## Undergraduate Research Attachment / Final Year Project Co-Supervisor

- 1. Mr Koh Wenbin (NUS, May-July 2009)
- 2. Mr Ma Xiaoping (NUS, May-July 2009)
- 3. Mr Pei Mingxing (NUS, May-July 2009)
- 4. Mr Wong Jingjie (NUS, May-July 2010)
- 5. Mr Joel Tong (NUS, May July 2013)
- 6. Mr Kevin Ward, (TCD, 10/2006-03/2007)
- 7. Mr. Colman O'Sullivan, (TCD, 10/2006-03/2007)
- 8. Mr. Eoin M Caffrey (TCD, 10/2007-03/2008)

#### Ngee Ann Polytechnic Student Research Programme Co-Supervisor

- 1. Mr Clifton Tan (Mar-Aug 2010)
- 2. Mr Chen Jingwen (Mar-Aug 2010)
- 3. Mr Xia Zhaobin (Sep 2010 Jan 2011)
- 4. Mr Luo Chao (Sep 2010 Jan 2011)
- 5. Mr Ngyuen Quang Linh (Sep 2010 Jan 2011)
- 6. Mr Toh Kah Chee (Sep 2010 Jan 2011)
- 7. Ms Wong Yoke Meng (Sep 2010 Jan 2011)
- 8. Mr Wan Shenjie (Sep 2010 Jan 2011)

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- 9. Mr Tan Yi Hong (Mar-Aug 2011)
- 10. Mr Tang Weiren (Mar-Aug 2011)

## Science Mentorship Programme (Ministry of Education, Singapore) Co-supervisor

- 1. Mr Yao Zexi, Motion Detection Using Wireless Networks, 01/2009-05/2009 (With Pius Lee)
- 2. Mr Isaac Ng, Mr Sim Xiang Rong and Mr Cao Yuxin, 01/2010-06/2010 (With Pius Lee)
- 3. Mr Govind Shankar Ganesan 01/2011-06/2011 (With Han Mingding and Zhuang Haojie)
- 4. Mr Ramgopal Venkateswaran and Mr Thirumoorthy Divagar 01/2013-06/2013 [Winner of Certificate of High Distinction and Silver Award, RE Congress, Raffles Institution]

## ANNEX-3: PAST PROFESSIONAL AFFILIATIONS / ACTIVITIES

Institute of Electrical and Electronics Engineers (IEEE).

2014 : Senior Member

2004-2014 : Member

2000-2004 : Student Member

ACM Singapore Chapter:

2009-2011 : Executive Committee Member (Coordinator, SIGMETRICS)

Asia Pacific Signal and Information Processing Association (APSIPA):

2010-2013 : Technical Committee Member, Wireless Communications and Networking

**Guest Editor**, International Journal of Ad Hoc and Ubiquitous Computing: Special Issue on Underwater Sensor Networks: Technology and Theory, 2011/2012

**Expert Technical Evaluator**, Singapore Ministry of Education Translational R&D and Innovation Fund, Singapore Israel Industry R&D Foundation (SIIRD), Dutch STW

**Reviewer** for Euro-NGI 2005, 2006, VTC Fall 2006, Spring 2007, Fall 2007, Spring 2008, Fall 2008, Spring 2009, Spring 2010, Spring 2011. PIMRC 2006, PIMRC 2007, PIMRC 2008, Med-Hoc-Nets 2005, ISWCS 2007, Mobility Conference 2007, 2008, 2009, AINA 2008, 2009, WCNC 2008, HiPC 2008, ICCS 2008, 2010, QoSim 2009, IEEE Globecom 2009, IEEE LCN 2009, IEEE ICICS 2009, ISSNIP 2009, ICDCN 2010, IEEE ISCC 2010, IEEE CWCN.

**Reviewer** for IEEE Journal of Wireless Communication, IEEE Journal of Communications and IEEE Transactions on Wireless Communications, Wireless Networks Journal, Journal of Telecommunications Systems, 3<sup>rd</sup> and 4<sup>th</sup> EuroNGI Workshop on Mobility and Wireless, IEEE Communication Magazine, IEEE JSAC, Annals of telecommunications, Wiley Journal of Wireless Communications and Mobile Computing, IEICE Transactions, EURASIP Journal of Wireless Communications and Networking, Journal of Industrial and Management Optimization, International Journal of Communication Systems, International Journal of Grid and Ubiqutous Computing, Elsevier Journal of Computer Communications, IEEE Wireless Communications Magazine, Elsevier Journal of Ad Hoc Networks, IEEE Transactions on Communications

## **Conference/Workshop Organization**

- 1. General Co-chair, IEEE ISSNIP 2014
- 2. Poster Co-chair, IEEE SECON 2014
- 3. Technical Program Co-Chair, IEEE AINA 2011
- 4. Technical Program Co-chair, IEEE ICCS 2012
- 5. TPC Member, IEEE AINA 2008, 2009, 2010

<sup>\*</sup> Authors are listed in alphabetical order for publications between 2000-2006.

- 6. TPC Member, 4th Euro-NGI Workshop on Wireless and Mobility, January 2008.
- 7. TPC Member, PIMRC 2008, 2012.
- 8. TPC Member, Mobility Conference, 2008, 2009, 2010.
- 9. TPC Member, IEEE ICCS 2008, November 2008.
- 10. TPC Co-Chair, IEEE International Workshop on Underwater Networks (WUnderNet), in conjunction with IEEE AINA, May 2009.
- 11. TPC Member, European Wireless 2009, May 2009.
- 12. TPC Member, IFIP Med-Hoc-Nets, June 2009, 2010, 2011, 2014
- 13. TPC Member, ICUFN, June 2009, 2010, 2014
- 14. General Co-Chair, 4<sup>th</sup> International Conference on Queueing Theory and Network Applications (QTNA), July 2009.
- 15. TPC Chair, 16<sup>th</sup> Infocomm and Media Horizons (ICM09), 7 October 2009.
- 16. General Vice-Chair, 18th Infocomm and Media Horizons (ICM11), Aug 2011.
- 17. TPC Member, ACM WUWNet 2009, 2011.
- 18. TPC Member, IFIP Wireless Days, 2009, 2010, 2011
- 19. TPC Co-Chair, WUnderNet 2009, 2010, 2011.
- 20. TPC Member, IEEE Globecom 2010, December 2010.
- 21. TPC Member, IEEE APWCS 2010, 2011.
- 22. Local arrangement chair, IEEE APWCS 2011.
- 23. TPC Member, Net-Coop, 2010, 2011, 2012
- 24. TPC Member, IEEE APCC, December 2010.
- 25. TPC Member, ACM MoMM, December 2011.
- 26. TPC Member, IEEE CMC, May 2012.
- 27. TPC Track Chair, CISIS 2012, July 2012.