

# Hwee-Xian TAN

Computer Scientist • Technologist • Mentor

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## 📍 Experience

### Data Science and Operations Research Advisor [FedEx Express, Asia Pacific](#)

📅 Jul 2020 – present

- Part of the APAC Analytics Center of Excellence team, which looks at the use of data science and machine learning to improve customs clearance, customer experience, and other logistics-related matters.

### Co-Founder

#### [Assisted Living Facilities Association @ \[alfasingapore.org\]\(#\)](#)

📅 Jun 2018 – present

- Established ALFA as a non-profit organization together with 3 other co-founders, to drive the advocacy of Assisted Living Facilities (ALFs) as an alternative care model for seniors in SG.
- ALFA co-opted more than 40 individual professionals to produce and launch the ALFA Good Practice Guide in Mar 2019.
- Guide R&D efforts to enhance care efficiency and effectiveness through the use of technology.

### Principal Consultant

#### [Mercurics @ \[mercurics.com\]\(#\)](#)

📅 Apr 2019 – present

- Mercurics is a deep-tech spin-off with a focus on people analytics.
- Lead R&D efforts to assess fitness for duty of vehicle captains for leading train transport company in Singapore.
- Guide technical development of commercial projects with major clients in Singapore and Japan.

## 💬 Recent Professional Activities

- EDAS Co-Chair, [IEEE Local Computer Networks \(LCN\)](#), 2020.
- Invited panelist, [Sundown Drinks: Future of Science](#), SGIInnovate, 2019
- Trainer/Speaker, [United Board Fellows Program Leadership Seminar](#), SMU, 2019
- Invited judge, [LCSI Youth E3 Impactthon](#), SMU, 2019
- Panelist, [Women Making a Difference with Technology](#), SMU, 2019
- Co-Instructor, [Workshop on IoT for Elderly](#), Universiti Putra Malaysia, 2019
- External Examiner, [Diploma in Business Information Technology \(DBIT\)](#), Singapore Polytechnic, 2018 – 2021
- Invited speaker, [Designing Technology for Seniors – What Seniors Want?](#), SUTD, 2018
- Invited speaker, [Ageing-in-Place in a Smart City: Opportunities, Challenges and the Road Ahead](#), HIMSS Thailand eHealth Summit 2018, May 2018
- Guest speaker, [Technology and aging: How can technology help people age in place and achieve successful aging](#), SMU, 2018

## ❤ Interests

Passionate about use of technology for smart cities, social good and inclusive societies. Other interests include Internet of Things (IoT), smart healthcare, analytics, computational psychology, logistics and business process improvements.

## 📁 Strengths

Grit • Highly motivated • Passionate • Hardworking • Positivity • Critical thinking • Team player

Systems architecture & design • IoT • Wireless networking • Analytics

## ★ Awards

*First Place*, [NCSS Sector Design Challenge](#), NCSS, 2019

*Nominee*, [SMU-X Excellent Teacher Award](#), SMU Teaching Excellence Awards, 2019

[2018 Shirin Fozdar Programme Diversity & Inclusion Award](#), Shirin Fozdar Programme, 2018

*2<sup>nd</sup> Prize*, [Designathon 2017](#), DesignSingapore Council, 2017

[The Award for Leading, Educating and Nurturing Talent \(TALENT\)](#), A\*STAR, 2014

[Outstanding Mentor Award](#), 20<sup>th</sup> Youth Science Conference, Ministry of Education, 2014


[NUS Research Achievement Award](#), NUS, Singapore, AY2009/2010

[Best Teaching Assistant Award](#), NUS, Singapore, AY2008/2009

[NUS Research Scholarship](#), NUS, Singapore, 2005-2008

## Previous Work Experience


Asst Prof of Information Systems (Practice)  
**Singapore Management University**

 Dec 2017 – present

- Co-Investigator of project Smart Barrier-Free-Access (SmartBFA) that uses crowdsourced sensor data from wheelchairs to map accessible paths across SG. Collaborated with town councils and social service agencies to engage more than 150 wheelchair volunteers to build up dataset to enable a more inclusive society.
- Co-Investigator of project Smart-Tech Attendance and Home Visits Recording System that uses Internet of Things (IoT), mobile and web technologies to improve more than 80% operational productivity for NTUC Health, in their care services for more than 2000 seniors.
- Designed and taught 3 new courses: (i) Smart Healthcare in Asia is an SMU-X elective whereby students work with industry sponsors on team projects; (ii) Smart City Systems & Mgmt is a 2<sup>nd</sup> year core module whereby students develop smart campus applications based on a RESTful framework; and (iii) Programming for Smart City Applications, which is a fundamental programming course that has received >6.5/7 rating in its first run.
- As Cyber-Physical Systems (CPS) Track Coordinator for the Computer Science degree, design course curriculum for students who major in the CPS track.
- Adjunct Teaching Mentor of the Internet of Things course.
- Health Economics and Management (HEM) Committee Member.

Senior Research Scientist


**SMU-TCS iCity Lab**

 Jul 2015 – Nov 2017

- Lead researcher of study on medication adherence in project SHINESeniors, which looks at technology-enabled ageing-in-place.
- Lead developer of Starlight, a Django-based backend system that stores and processes (sensor) data from over 100 senior residents.
- Evaluated use of Internet of Things (IoT) to detect seniors with Mild Cognitive Impairment (MCI), with promising preliminary results.

Scientist I/II


**Institute for Infocomm Research, A\*STAR**

 Aug 2012 – Jul 2015

- Lead designer and developer of UniNet, a wireless multihop networking protocol to reliably acquire sensor data in harsh outdoor environments. UniNet was deployed for use in multiple Smart Nation related industry projects in various parts of SG.

Research Associate/Fellow


**National University of Singapore**

 Jul 2010 – Aug 2012

- Researched on resource allocation in vehicular disruption tolerant networks, as part of the Future Urban Mobility (FUM) study on on-demand mobility services to efficiently match commuters to taxis.
- Visiting scholar @ MIT CSAIL between Sep – Dec 2011.


## Education

Ph.D. in Computer Science  
**National University of Singapore**

 Jan 2005 – May 2011

Thesis topic: Communication Protocols for Energy-Constrained Networks

B. Computing (Comp Eng)  
with Minor in Technopreneurship  
**National University of Singapore**

 Jul 2001 – Dec 2004

Thesis topic: Dynamic Adaptation of MANET Routing Protocols

## Publications

Early Detection of Mild Cognitive Impairment With In-Home Sensors to Monitor Behavior Patterns in Community-Dwelling Senior Citizens in Singapore: Cross-Sectional Feasibility Study, Journal of Medical Internet Research, 2020

Sustainable technology-enabled innovations for ageing-in-place: the Singapore example, Handbook of Inclusive Innovation, 2019

Objective Sleep Quality as a Predictor of Mild Cognitive Impairment in Seniors Living Alone, IEEE Big Data 2019

SmartBFA: A Passive Crowdsourcing System for Point-to-Point Barrier-Free Access, IEEE LCN 2019

Technology-Enabled Medication Adherence for Seniors Living in the Community: Experiences, Lessons, and The Road Ahead, HCI International 2018

Identifying Elderlies at Risk of Becoming More Depressed with Internet-of-Things, HCI International 2018

Technologies for Ageing-in-Place: The Singapore Context, Living in Smart Cities: Innovation and Sustainability, 2017

Unobtrusive Monitoring to Detect Depression for Elderly with Chronic Illnesses, IEEE Sensors Journal, 2017

Information-Quality Aware Routing in Event-Driven Sensor Networks, IEEE INFOCOM 2010

[extended list @ Google Scholar]