



Hwee-Xian TAN, Ph.D.

Computer Scientist • Technologist • Problem Solver

✉ tan.hweexian@gmail.com 🌐 hxtan.info 📍 Singapore

♥ Interests

Passionate about use of data science, data analytics and business intelligence to drive business and societal outcomes, particularly in the domains of smart cities, healthcare, logistics, social good and inclusive societies.

Technological interests include Internet of Things (IoT), Natural Language Processing (NLP), Geospatial Analytics and Computational Psychology.

★ Awards

[Bravo Zulu Award](#), FedEx Express, 2021

[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

[2nd Prize, Designathon 2017](#), DesignSingapore Council, 2017

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

[Outstanding Mentor Award](#), 20th 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

🔗 Professional Experiences

Data Science & Operations Research Advisor

[FedEx Express, Asia Pacific](#)

📅 Jul 2020 – present

- Product Owner and Scrum Master of a team that works across three geographical regions (SG, MY and IN) to develop and successfully deliver TIBCO Spotfire dashboards for the Marketing team.
- Primary developer of a Python-based end-to-end pipeline that acquires and processes data from Teradata databases and visualizes them on a Power BI dashboard; this dashboard empowers multiple teams across Marketing, Sales and Network planning to make daily data-driven decisions related to demand and capacity.
- Led the development of a rule-based engine as part of a Proof-Of-Value (POV) to maximize container utilization at flight transits; the full solution is projected to provide more than USD18M revenue gain per annum.
- Researched on the use of GPS locations that are captured from distributed devices to perform reverse geocoding, which are essential for shipment pickups and deliveries in geographical regions without authoritative maps.
- Developed a Flask-based API service that combines Elasticsearch and Machine Learning to provide Harmonized Tariff Schedule (HTS) code prediction services for brokers during import clearance, with a target accuracy of 80%.
- Spearheaded the Advisor Community of Learning (ACL) in the Analytics Center of Excellence in FedEx APAC, which facilitates sharing sessions and discussions amongst the professionals.

Adjunct Faculty

[Singapore Management University](#)

📅 Jan 2021 – present

- Course instructor for the graduate course IS614 Internet of Things: Technology and Applications.
- Designed course curriculum, delivered course and mentored graduate students for their team projects (which requires them to build an IoT prototype for a real-world problem).
- In the most recent edition (Jan-Apr 2022) of the course, one of the student teams won 2nd place in the Microsoft AI for Accessibility Hackathon 2022.

Co-Founder and Project Lead

[Smart Barrier Free Access \(SmartBFA\) @ smartbfa.com](#)

📅 Jan 2018 – present

- Co-founded the SmartBFA (Smart Barrier-Free Access) project, which aims to build a "Google Maps" for wheelchair users in Singapore.
- SmartBFA is partially funded by the Tote Board Enabling Lives Initiative Grant (TB-ELI) across 2 grant calls.
- Managed the budget (>\$1million) and strategic roadmap of the project.
- Led the team in product design and technical development.
- Established partnerships with both public and private entities to come together to build an inclusive society through wheelchair accessibility in Singapore.


Certifications

Certified SAFe® 5 Product Owner/Product Manager


Certified SAFe® 5 Practitioner

Education

Ph.D. in Computer Science
[National University of Singapore](#)

 Jan 2005 – May 2011

B. Computing (Comp Eng)
with Minor in Technopreneurship
[National University of Singapore](#)

 Jul 2001 – Dec 2004

Strengths

Adaptable • Highly motivated • Passionate • Hardworking • Positive • Team player • Stakeholder management


Systems architecture & design • IoT • Wireless networking • Data analytics • Data visualization and Storytelling

Media Mentions

- [#SGPerspectives](#)
[#TechForGood](#) [Part 1](#) and [Part 2](#), Gov.sg, May 2022.
- [Smart sensors to test seniors' cognitive functions](#), The Straits Times, Jul 2020.
- [Is technology up to helping the disabled with problems of daily living?](#), ChannelNewsAsia, Mar 2020.
- [App to help those with disabilities get around expected to be launched by mid-2019](#), The Straits Times, Oct 2018.
- [Independent living for seniors - with help if needed](#), The Straits Times, Jun 2018.

Prior Work Experiences


Asst Prof of Information Systems (Practice)
[Singapore Management University](#)

 Dec 2017 – Jun 2020

- 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 2nd 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, designed 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.

Selected Activities

- Course instructor, [Industry Events](#), Singapore Data Science Consortium, 2020-2021
- Invited speaker, [Creating a Barrier-Free Singapore through Crowdsourcing – the SmartBFA Experience](#), STACK 2020 Developers Conference, 2020
- Invited panelist, [Sundown Drinks: Future of Science](#), SGInnovate, 2019
- Trainer/Speaker, [United Board Fellows Program Leadership Seminar](#), SMU, 2019
- Invited judge, [LCSI Youth E3 Impaction](#), 2019
- Panelist, [Women Making a Difference with Technology](#), SMU, 2019
- Invited speaker, [Ageing-in-Place in a Smart City: Opportunities, Challenges and the Road Ahead](#), HIMSS Thailand eHealth Summit 2018, May 2018
- Invited speaker, [Technologies to Enhance Quality of Life in An Ageing Society](#), 12th Asia Conference on Pensions and Retirement Planning, 2016
- Speaker, [Lessons from Large-Scale Wireless Sensor Network Deployments](#), Hackware 0.7 Meetup, 2015

Other Professional Engagements

Consultant & Scientific Advisor
[Mercurics @ mercurics.com](mailto:Mercurics@mercurics.com)

 Apr 2019 – present

- Mercurics is a deep-tech social enterprise 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 public and private clients in Singapore and Japan.

Co-Founder

[Assisted Living Facilities Association @ alfasingapore.org](http://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.