Wilbert Biao-Hui Tan

Email: wilbertbh.tan@gmail.com **Github:** github.com/Wilbertbh-Tan **LinkedIn:** linkedin.com/in/wilbert-tan/

Education

National University of Singapore (NUS) Aug. 2016 – Jun. 2021
B.Eng (Honors), Electrical Engineering
University Scholars Programme – Interdisciplinary Honors Track
Honors Thesis: Spin-wave approaches towards a spiking neural network implementation,
Supervised by Prof. Kelvin Xuanyao Fong, Examined by Prof. Gengchiau Liang
UROP: Bioelectric Interfacing: Communication between Computers and Bacteria for Glucose Monitoring,
Supervised by Prof. Poh Chueh Loo
Coursework: Signal Processing, Computer Vision, Data Structures & Algorithms, Fuzzy/Neural Systems for Intelligent Robotics, Biophysics, Embedded Systems, Analytical Methods in Electrical Engineering

Korea University, South Korea 2018
Winter Exchange Program
Coursework: Abnormal Psychology, Business Ethics

Fudan University, China 2015
Mandarin Language Program

Research Experiences

Independent Research Jan. 2025 – Present
- *Studying and implementing research from foundational and recent AI/ML literature, focusing on mechanistic* interpretability
- *Developed end-to-end RAG (Retrieval-Augmented Generation) report generation for deep research. Also developed a web crawler for real-time market data, news and sentiment with deterministic quoting*
- *Built an eye and gaze tracking system for mobile devices using multi-stage models (MediaPipe, YOLO) to control the screen*

Neuromorphic Computing Researcher, SEEDER Group (NUS) Aug. 2020 – May 2021
- *Designed spin-wave implementation of spiking neural networks with spike-timing-dependent-plasticity*
- *Developed Mumax3 (Go) micromagnetic simulations to model spin-wave propagation and plasticity dynamics. Conducted simulations on high-performance clusters*
- *Supervisor: Prof. Kelvin Xuan Yao Fong; Examiner: Prof. Gengchiau Liang*

Undergraduate Researcher, Engineering Biology Lab (NUS) 2018 – 2019
- *Investigated framework for bioelectric signal interfacing between bacterial systems and computational platforms for glucose monitoring and synthesis*
- *Transformed time series data into images using Gramian Angular Field and Markov Transition Field encodings, classifying patterns with a Residual Neural Network (ResNet)*
- *Supervisor: Prof. Chueh Loo Poh*

Lead/Computational Modelling Lead, NUS–iGEM Biosafety Containment 2017
- *Led NUS iGEM team in engineering novel biological kill-switch system for synthetic biology containment, awarded Gold Medal (top bracket among 310 teams worldwide)*
- *Directed computational modeling using ordinary differential equations (MATLAB, AdvanceSyn) to inform wet-lab experimental design*
- *Conducted stakeholder engagement and policy research, integrating biosafety feedback into system design. Secured equipment sponsorship and submitted grant applications*
- *Collaborated with international iGEM teams across the United States, France, United Kingdom, Pakistan, and Germany*

Applied Research & Industry Experiences

Customer Success Manager (AI), US Financial Services, IBM Jun. 2024 – Sep. 2024

- *Served as trusted technical advisor to Fortune 500 financial services clients on AI strategy, data governance, and LLM implementation*
- *Scoped AI solutions for data governance, data strategy, and large language model (LLM) initiatives for financial services clients in competitive vendor evaluations*

Data Scientist, IBM Expert Labs May 2022 – Jun. 2024

- *Led, designed and deployed enterprise AI/ML solutions for first-of-a-kind, complex projects in the sustainability industry*
- *Architected full-stack ML pipelines with MLOps best practices (monitoring, governance, scalability) and led knowledge transfer to internal and client teams*
- *Deployments and models span: anomaly detection, deep learning, survival modeling, reinforcement learning, time-series forecasting, machine learning, mechanistic modeling, and computer vision*
- *Led development of the Electrical Model Suite for electrical transformer health analytics, integrated into IBM Maximo and deployed to 1,000+ enterprise customers. Served as primary code contributor and managed project delivery in collaboration with product and research teams. Presented and demonstrated to clients and senior management. API Documentation*

Lead Firmware Engineer, GogoTech Aug. 2021 – Apr. 2022

- *Led firmware and embedded control system development for an affordable smart wheelchair funded by the Melinda Gates Foundation and TechStars*
- *Deployed lightweight computer vision models for real-time on-device navigation and obstacle avoidance*

Electrical Controls Researcher, Rolls-Royce R&D Systems Integration Jan. 2019 – Aug. 2019

- *Developed predictive control algorithms to enhance droop control response by anticipating load and generation fluctuations in microgrid systems*
- *Designed network architecture to ensure data reliability in industrial programmable logic controllers (PLCs) communication*
- *Designed UI for human-machine interface for controlling PLC*
- *Supervisors: Professor Sanjib Kumar Panda & Dr. Souvik Dasgupta*

Electrical Engineer Lead, Singapore Grand Challenge 2019

- *Designed and deployed a wearable gait analytics and fall-risk assessment device (ESP32, Bluetooth, C, Altium) across multiple Singapore eldercare facilities, enabling remote clinical assessment for physical therapists*
- *Awarded Second Prize, and Marketing Prize, totalling $20,000 SGD. News Article (Chinese)*

Team Lead, CNES-ESA ActinSpace Challenge 2018

- *Developed a 3D-printed water-vapor micro-thruster prototype for low-cost and environmentally friendly cubesat propulsion*
- *Early validation of viability of lightweight, low-power thrust systems for nano-satellite manoeuvring*
- *Awarded second prize in the Centre National d'Études Spatiales & European Space Agency (CNES-ESA) global competition held in Toulouse, France*
- *Awarded the CNES-ESA Airbus Defence & Innovation Prize: Create new concepts of small satellites or payloads for Airbus satellites and drones. Awarded the Singapore Space & Technology Regional Prize. News Article*

Awards and Honors

Singapore Medical Grand Challenge (Second Prize - *$15,000, Marketing Prize - $5,000*)* 2019
Wearable Gait Analysis and Fall Prediction

CNES–ESA ActinSpace Airbus Defence and Innovation Prize 2018
Vaporizing Liquid Microthrusters (VLMs) for Cube Satellites

CNES-ESA ActinSpace Global Competition (Second Prize) 2018
Vaporizing Liquid Microthrusters (VLMs) for Cube Satellites

Singapore Space & Technology Competition (First Prize) 2018
Vaporizing Liquid Microthrusters (VLMs) for Cube Satellites

International Genetically Engineered Machines Competition (Gold Medal) 2017
Project title: Making Engineering of Customised Kill Switches Easier

Australian Health Startup Competition: NomNomSnap (First Prize) 2016

Computer Vision System for Dietary Assessment

SpaceX Hyperloop Competition (Top 30 Finalist, among 120+ teams worldwide) 2015
Keioalpha Hyperloop Team

** Awarded amounts in SGD; only select awards included*

Publications

- [Thesis] Tan, W. (2021). Spin-wave approaches towards a spiking neural network implementation. B.Eng Honors Thesis, National University of Singapore.

Invited Presentations, Posters, Conferences

IBM Maximo Models for Electrical Transformers Oct. 2024
IBM TechXchange

Reinforcement Learning for Complex Job Shop Scheduling Sep. 2023
IBM TechXchange

Failure Prediction in Electrical Transformer Asset and Time Series Data Sep. 2023
IBM TechXchange

Wearable for Gait Analysis & Fall Prediction Oct. 2019
Yong Loo Lin School of Medicine, National University of Singapore

InsertSpace: Equipping Nanosatellites with 3D Printed VLM Thrusters Jun. 2018
Toulouse Space Center, France

InsertSpace: Equipping Nanosatellites with 3D Printed VLM Thrusters Apr. 2018
Singapore Space Challenge, Singapore

Making the Engineering of Customisable Kill-Switches Easier Nov. 2017
iGEM Grand Jamboree Poster & Presentation, Boston

Keio Alpha Hyperloop Poster Presentation Jan. 2016
SpaceX Hyperloop Competition, Texas A&M

Services & Outreach

Pro-Bono Consultant, Conjunct Consulting (NUS Consulting Club) 2020
Developed volunteer engagement strategies for call center workers at youth wellness social enterprise in Singapore

Educational Support Volunteer for Migrant Learning Center, Little Beans 2015
Weekly teaching English to students from migrant family backgrounds in Shanghai

Educational Support Volunteer for Special Needs, Little Beans 2015

Facilitated weekly learning and play-based activities for special needs students across primary and vocational levels

Educational Support Volunteer for Non-Verbal Students, Mudgeeraba Special School 2014

Facilitated weekly learning and play-based activities for non-verbal students and organized book sale fundraiser for a disability-accessible bus

Other skills

Programming: Python, BASH, C, C++, Verilog/VHDL, Assembly, Java, MATLAB, Go, Unity, PyTorch, PyG, TensorFlow, LangChain, HuggingFace, gymnasium, Docker, Kubernetes, Flutter, HTML, Selenium

Languages: English (native), Mandarin (fluent), Korean and Japanese (Intermediate)