CELESTE TAN

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EDUCATION

National University of Singapore — **Singapore**
Bachelor of Engineering in Computer Engineering. GPA 4.50/5.00. — Aug 2024 – Present

- Relevant Coursework: EPP1, EPP2, Data Structures and Algorithms, Digital Design, Signals and Systems, Linear Algebra for Engineering, Differential Equations for Engineering, Discrete Structures
- Expected Date of Graduation: May 2027

Raffles Institution — **Singapore**
H2 Computing, H2 Math, H2 Physics, H1 Econs. AAA/B. RP 88.75/90. — Jan 2022 – Dec 2023

- CCA: Automatica Club (Robotics) & Audio-Visual Club

EXPERIENCE

Private Tuition (Part-time) — **Singapore**
Personal Coding Tutor — Oct 2024 - Present

- Teaching Scratch, Swift & Python concurrently weekly, designing a suitable curriculum tailored to individual needs and motivations. Introduced project-based learning for better understanding of content.

DSO National Laboratories, Singapore — Oct 2022 – Dec 2022 (Onsite)
Research Intern (Team Lead) — Mar 2022 – Oct 2022 (Hybrid)

- Designed a reflectarray antenna prototype based on rectangular phoenix cells
- Developed different reflectarray cell designs, calculated and generated reflectarray models and simulated them to optimise performance.
- Awarded
    - Gold Award in Singapore Science and Engineering Fair 2023 (SSEF, National)
    - Silver Award in ASEAN Student Science Project Competition 2023 (ASPC, Regional)

PROJECTS

HornetX — **National University of Singapore**
Software IC — Aug 2024 – Present

- Leading the Software subteam of the Hornet programme under Team Bumblebee.
- Developing an Autonomous Underwater Vehicle (AUV) for Singapore AUV Challenge 2025.
    - Interfaced Jetson Xavier NX with Blue Pill using CAN protocol for sensors and thrusters.
    - Developed PID controller for a 7-thruster configuration for translation and rotation in all 3 axis
    - Oversaw the ROS2 workspace integration and Ubuntu setup

VIAWiki — **www.viawiki.org**
Lead Software Engineer, Core Team — Jun 2021– Aug 2024

- Developed a full-stack web app using Next.js V14 App Router for a centralized database of Singapore student-led service projects, deployed on Vercel
    - Implemented 3 levels of custom admin permissions (Publisher, School Admin & Global Admin) with different admin dashboards to edit and approve individual users, events, projects and/or school details, with automated deletion of projects upon expiry
    - Designed filtering and searching system for projects via 3 categories of tags and/or name
    - Automated a volunteering function to collate volunteers for projects' events
    - Designed system for individual authors to edit the resources database and blogs to help start up projects, subject to approval of the changes by admins of appropriate level in dashboard

RoboCup Junior Rescue Line U19 2023 — Club Automatica

Champion, 1st (Nationals) Nov 2023 – Jul 2024
Best Engineering Process (Internationals, Bordeaux)

- Team leader of Team Bugless (4 members). In charge of both software and hardware.
- (Software) Developed an OpenCV robot using Raspberry Pi 4B, Raspberry Pi Pico and two cameras running multithreaded to traverse a line and obstacle course, detect, pick up, store and deposit balls safely in a deposit area. Comms by UART and I2C.
- (Electric) Designed a customized PCB sandwich robot with SMT for motor drivers and multiplexers, and a secondary PCB for a light sensor array with separate microcontroller Teensy 2.0
- (Mechanical) Custom mechanical 3D printed gear train for customizable motor to wheel gear ratio, for modifiable torque. CAD and 3D printed mounts for every assembled part

RoboCup Asia Pacific Rescue Line U19 2023 Centre of Robotics Excellence
Champion, 1st (Regionals) Sep 2023 – Nov 2023
Most Educational Value (Regionals)

- Developed an OpenCV robot using Raspberry Pi 4B, Teensy 3.5 and a single camera

World Robotics Olympiad (WRO) Club Automatica
Champion, 1st (Nationals, National Robotics Championship (NRC)) Nov 2023 – Jul 2024
Judges' Award (Nationals, NRC)
Best Technical Challenge (Nationals, NRC)
12th of 71 teams (Internationals, Dortmund, WRO)

- Developed an EV3 robot in EV3-G to complete competition tasks: pick up and storage of items, movement of objects and depositing items based on information gathered by robot
- Optimized movement of robot by using movement arcs based on custom inputs instead of a series of turns and translation. Implemented PID for basic line tracking and better intersection detection.
- Implemented a cam mechanism for the raising of items with controlled lift, less electronic feedback and higher power efficiency, leading to higher overall mechanical efficiency

RoboCup Junior Rescue Line U19 2022 Club Automatica
Champion, 1st (Nationals) Jan 2023 – Apr 2023

- Developed an OpenCV sandwich PCB robot using Raspberry Pi 4b, Arduino Mega 2560 and a single camera, with 3D printed mounts. First team within national competition to implement computer vision.

TECHNICAL SKILLS

Programming: Python, C, C++, JavaScript, TypeScript, SQL, MongoDB, MATLAB, EV3-G.
Robotics: Verilog, OpenCV, PCB Design, Soldering
Platforms: ROS Noetic, ROS 2 Humble, AVR MCUs, EV3
Web/App: HTML, CSS, React, Swift, AWS S3, Figma, Next.js V14
Computer-aided Design: Fusion 360, Solidworks
Others: CST Studio Suite, EM Wave Studies, Excel

LICENSES & CERTIFICATIONS

- Microsoft certified AI-900: Microsoft Azure AI Fundamentals (October 2022)
- AI for Industry – Literacy in AI (October 2021)

OTHER AWARDS

- E-Scholars Scholarship & E-Scholars Programme (2024 – 2028)
- CSIT Computing Scholarship (2022)
- KS Goh New Media & Technology Award (2021)
- 1st Placing at Microsoft Digigirlz (2020)
- High Distinction in Computational and Algorithmic Thinking Competition (2018)