Jeremy Choo

Robotics Engineer · Software Architect

(+65) 8866 1242 | jchoo033@e.ntu.edu.sg | youtube.com/@professionalchoo | esotericbao | professionalchoo

Summary

Mechanical Engineering student at Nanyang Technological University with expertise in robotics, AI-driven software, and hardware integration. Strong experience in AI development, motion control, and embedded systems. Passionate about automation and innovative engineering solutions with a proven track record in leading projects and mentoring teams.

Work Experience

Intern
Singapore

Home Team Science & Technology Agency
Jan. 2025 - Jun 2025

- Developed an AI chatbot with a Retrieval-Augmented Generation (RAG) pipeline using Llama.cpp and LangChain, improving document retrieval efficiency by 30%.
- Conducted field testing for deployed robots, ensuring robustness and seamless user transition.
- Designed and implemented a motion control library for a bipedal humanoid robot, enhancing locomotion stability.

Maker and Tinkering Lab Assistant
Singapore

Nanyang Technological University
Sep. 2023 - Dec 2024

- Mentored over 50 CN Yang Scholars in electronics, CAD design, and prototyping.
- Designed and 3D-printed over 100 custom components in SOLIDWORKS for research projects.
- Developed custom PCB and Arduino shields with KiCAD, optimising performance across various applications.
- Maintained and serviced over 30 3D printers and 8 soldering stations, minimising downtime.
- Supported NTU Openhouse events and Physics lectures experiments, enhancing interactive learning experiences.

Teaching Assistant
Singapore

Nanyang Technological University
Jan. 2024 - Apr 2024

- Taught a Motion Study Control Class using an Ender 3 frame, Ramps 1.4 controller, Marlin firmware, and CNCjs software, mentoring a total of 32 students throughout the semester.
- Evaluated and provided constructive feedback on student assignments and projects, helping them improve their understanding and performance.
- Supported students during lab sessions, ensuring they applied theoretical concepts effectively and troubleshooting technical issues.

IT Manager
Singapore

Gavin's Tuition
Aug. 2022 - Feb 2023

- Implemented smart systems across two centres, streamlining operations and improving client experience.
- Managed IT infrastructure and server maintenance, enhancing system reliability.
- Developed and launched two Python computing courses, expanding the educational offerings and boosting student enrollment.

Software Developer
Singapore

Ngee Ann Polytechnic
Jan. 2020 - Sep 2020

- Developed ROS-based software for mobile bases, with a focus on enhancing navigation and operational.
- Developed Linux services to automate startup commands and enable journaling for enhanced system management.

Autonomous Mobile Base *Jun. 2020*
- Led a team of 3 in building an Autonomous Mobile Base using ROS, achieving a successful proof-of-concept.
- Designed and constructed the mechanical structure, circuitry, and SLAM algorithm from the ground up, ensuring system integration.

NParks Patrol Robot *Mar. 2020*
- Partnered with NParks to deploy a safe-distancing robot at Bukit Timah Nature Reserve, enhancing public safety.
- Integrated 3D SLAM on a SCOUT base with 3D LiDAR, enabling navigation in complex and obstructed environments on uneven terrain.
- Developed facial recognition and person detection software using OpenCV and PyTorch, improving real-time monitoring and compliance.

Teaching Assistant Robot - CODDIE *Jan. 2020*
- Led the development of ROS navigation stack, and integration with latte panda for user control.
- Featured in multiple media outlets including newspapers for innovative contributions to educational technology.

Education

Nanyang Technological University *Singapore*

B. Eng. Hons Mechanical Engineering *Aug. 2022 - May. 2026*

Ngee Ann Polytechnic *Singapore*

Diploma in Clean Energy Management *Jun. 2017 - Mar. 2020*

Accomplishments

Best Project Awarded in Making and Tinkering 2023

Nanyang Technological University *Dec 2023*

- Developing an award-winning *Mars Rover* with *Rocker-bogie* suspensions, showcasing innovation in Automotive technology
- Engineered and fabricated a custom PCB using KiCAD, enhancing the rover's operational efficiency by integrating 6 motor drivers, 2 PWM expansion boards, and power distribution with 3 distinct step-down voltages
- Performed an in-depth motion study and stress analysis using SOLIDWORKS, significantly improving the rover's mobility and overall performance

2nd Place Awarded in IdeasJam Hackathon 2023 *Singapore*

Nanyang Technological University *May. 2023*

- Designed an AR app for mental health consultation, integrating usercentric features to enhance accessibility.
- Developed a comprehensive business proposal with a roadmap and financial plan, demonstrating market viability.

Final Year Project *Singapore*

Ngee Ann Polytechnic *Jan. 2019*

- Designed and fabricated a docking station using SOLIDWORKS, enhancing the operational efficiency of an Autonomous Mobile Base.
- Developed a docking protocol for an Autonomous Mobile Base using ROS, ensuring accurate and reliable docking.

Extracurricular Activity

MECATRON *Nanyang Technological University*

Software Lead *Aug. 2022*

- Directed the software team for the Underwater Autonomous Vehicle competition.
- Integrated a control system using Pixhawk with Jetson Nano and ROS.

Chess Club *Nanyang Technological University*

Captain *Dec. 2022*

- Lead the training of team members to improve overall skill level.
- Participated in several interhall chess competition.

Skills

Programming	Python, C, C++, HTML, Javascript, CSS, ReactJS, Streamlit, Django, Flask, FastAPI, Langchain, LabVIEW
Robotics & AI	AI Expert, Large Language Model, ROS, ROS2, SLAM, Navstack, llama.cpp, OCR, Gazebo
Embedded Systems	Arduino, ESP-IDF, FPGA, STM32,
CAD & PCB Design	SOLIDWORKS, Autodesk Fusion 360, Altium, KiCAD, AutoCAD
Software & Tools:	Linux, Windows Powershell, Simplify3D, Cura, LightBurn, CNCJS, Adobe Premiere Pro, Adobe Photoshop, Microsoft Office
HardSkills	Troubleshooting, Soldering, Electronics, 3D Printer, Voron