Dan Huy NGUYEN

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EDUCATION

University of New South Wales **Feb 2018 – April 2024**

Bachelor of Engineering (Hons) (Mechatronics) / Bachelor of Science (Computer Science)

- Cumulative WAM of 82.622.
- Notable courses: DESN2000(99), ENGG3600 (94), MATH2019 (93).

Patrician Brothers' College Fairfield **Oct 2017**

Higher School Certificate

- ATAR of 94.25.
- Subjects: Extension 2 Mathematics, Extension 1 Mathematics, Chemistry, Physics, English Advanced.

WORK EXPERIENCE

UNSW

Casual Academic **Sep 2021 – Current**

- Administrated courses by planning curriculum and creating course content (e.g. assessments, tutorial questions, and lecture slides) for MTRN2500, MTRN3100, MTRN4231.
- Taught and mentored classes by adapting course material tailored to actual student knowledge, running help sessions, and marking for DESN1000, DESN2000, MTRN2500, MTRN3100, MTRN4110, COMP9024.
- Optimise processes using tools like Make, GitHub Actions, GitHub Classrooms, and custom C++ autotesters.

Sperospace

Mechanical Engineering Intern **Jul 2021 – Oct 2021**

- Conceptual design of an end effector (technology readiness level 3) for use in space applications using engineering concept design tools.

PROJECT EXPERIENCE

Split Payment App **Sep 2023 – Current**

Application Developer

- Solely prototyping multiplayer split-payment app (Vite and React) with fractional splitting enabled by multi-range slider, receipt-digitisation enabled by OCR, and deployed with Firebase.
- Iterated multiple times to fine-tune UI/UX.

Sumobots

Sumoltaneous Equations **May 2022 – July 2022**

- Organised team and delegated WBS (waterfall) to deliver 1st place winning sumobot in MTRNSoc x CREATE Sumobots Competition Advanced Stream.
- Participated in concept generation of solution and requirements.
- Soldered and assembled electrical system.
- Architected robot software design and control loop.

UNSW Competitive Robotics Group

Robotics Student Engineer **Sep 2021 – June 2022**

- Created ROS control, description, and gazebo packages for end effector and combined UAV/end effector robots.
- Modelled CAD artefacts with URDF/Xacro/SDF for Gazebo simulation.
- Assisting project management with MS Teams management and WBS development.

Offworld Robotics

Project Manager **Dec 2020 – June 2022**

- Supervision of a leadership team to conduct operations with respect to project management plan and systems engineering management plan.
- Centralisation and refinement of processes, structures, documentation, and workflows onto GitLab to improve organisational efficiency and standardise quality.
- Development of a learning curriculum covering design and implementation of robotic systems for upskilling of Offworld Robotics students.

Mechanical & Manufacturing Student Engineer **Jan 2020 – Dec 2020**

- Designed ladder-frame chassis, bogie suspension, and limited-slip differential with hybrid agile-waterfall design process for rapid iteration and 3D-printing manufacturing.
- Simulated and optimised parts in various loading conditions with FEA.
- Invented unique differential as proof-of-concept of kinematic mechanisms for integration with bogie suspension.

Competition Experience

Accenture Technology Bootcamp **Feb 2022**

- Developed proof-of-concept "GitLab Team Management" application in Django/Python connecting to GitLab API to enhance people management capabilities.

WIESoc x IBM Hackathon **Oct 2020**

- Developed prize-winning "COVID Safe Link" website in Flask/Python connecting to Google Maps API and NSW Open Data Platforms to plan safe travel through populated areas and public transport.

WIESoc x Aurecon Design Challenge **Sep 2019**

- Conceptualised an innovative solution to assist unconfident and learning drivers in adapting to high-speed lane mergers and intersection turns.

Volunteer Experience

CSESoc Peer Mentoring

Peer Mentor **Feb 2022 – May 2022**

- Assist students transition into university life with degree plan strategy.
- Help students setup development environments e.g. SSH, VSCode, and C build tools.

Engineering World Health Summer Institute

Biomedical Equipment Technician **Dec 2018 – Feb 2019**

- Trained in student volunteer program in Cambodia with acquired skills in soldering, mechanical and electrical repairs of biomedical equipment.
- Repaired and returned to service twenty-seven hospital equipment in four-week rural hospital placement.
- Built AC-to-DC rectifier to extensively test electrical circuits of biomedical equipment.

Academic Projects

MMAN4010/4020 – Thesis A/B **May 2023 – Dec 2023**

- Lead team of students to build proof-of-concept website for real client to achieve course marks of 95 and 89.
- Architected system which was a website integrated with a mechatronic system to automate control of multiple TVs using websockets over WiFi.

COMP6080 – Web Front-End Programming **May 2023 – Dec 2023**

- Built frontend Airbnb clone (using React, Mantine, SWR, Axios, Wouter, Zustand) given a backend API to achieve course mark of 90.

COMP3900 – Computer Science Project **Feb 2022 – May 2022**

- Revamped "GitLab Team Management" Django project with full-stack boilerplate and upskilled team on Django framework.
- Implemented SSO with GitLab web service using django-oidc, GitLab API calls on top of requests library, text search with django-haystack, and object-level permissions with django-rules.

MTRN4110 – Robot Design **May 2021 – Sep 2021**

- Architected the robot software for a maze-solving robot with autonomous navigation using world imaging data processed with OpenCV.
- Hacked Webots build platform to simultaenously execute C++ and Python programs with Cython interface.

MTRN3500 – Computing Applications in Mechatronics Systems **May 2020 – Sep 2020**

- Developed multi-process application for LiDAR and GNSS processing, and teleoperation of a robot using shared memory IPC.
- Built TCP/IP client with WinSock2 to connect to robot over WiFi.
- Designed GUI to visualise robot data processing and motion using OpenGL.

COMP1531 – Software Engineering Fundamentals **Feb 2020 – May 2020**

- Developed back-end and API in Flask/Python for a Slack-like application achieving a project mark of 97.

Achievements

- UNSW Dean's Honours List. **2021**
- UNSW Dean's Honours List. **2020**
- UNSW Dean's Honours List. **2019**
- New Colombo Plan Scholarship Recipient. **2018**
- RACI NSW Schools Titration Competition – Silver Award. **2017**
- Corporal of Australian Army Cadets. **2016**

Technical Skills

Robotics development

- ROS1/2, RViz, Gazebo.
- Webots.
- URDF, SDF.
- Low-level C/C++.
- C++20 (Catch2, GoogleTest, doctest, GoogleBenchmark).
- Assembly (MIPS).
- MATLAB (Simulink).

App Development

- HTML, CSS, JS, TS.
- React (Mantine UI, Chakra UI, React Hook Form, React Query, SWR, Wouter, Zustand).
- PostgreSQL, PL/pgSQL.
- Firebase (Hosting, Firestore).

Software Tools

- Python.
- git.
- GitHub (Actions, Classroom).
- GitLab.
- VSCode, Visual Studio.
- WSL, Ubuntu, Debian, Windows 10, Mac.

Mechanical & Manufacturing

- 3D CAD (Solidworks, Autodesk Inventor Professional, Fusion360).
- Manual metal machining (Lathe, Mill).
- 3D-printing.
- Laser cutting (Trotec).
- Water jet cutting (ProtoMAX).

Office

- Microsoft Office (Outlook, Word, Excel, PowerPoint, Teams, SharePoint, Planner, Forms).
- LaTeX, ConTeXt.
- Markdown (Mermaid, GitLab Flavoured).

Certifications

TAFE Statement in UNSW Engineering Mechanical **Nov 2019**

- Use Hand Tools.
- Use Workshop Machines for Basic Operation.