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

- Involved in planning course curriculum and content from assessments to lectures for C++ and robotics courses across all year levels.
- Taught and mentored classes, ran help sessions, and marking for engineering design, robotics, and C++ courses.
- Lead migration for delivery of course content using GitHub Classrooms.
- Optimise processes using scripting, build tools, CI/CD tools.
- List of courses taught for: DESN1000, DESN2000, MTRN2500, MTRN3100, MTRN4110, COMP9024.
- List of courses administrated for: MTRN2500, MTRN3100, MTRN4231.

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

TV Mate

May 2024 – June 2024

Application Developer

- Designed and implemented a Flutter app and mDNS-enabled IR-firing IoT devices for remote control of multiple TVs via websockets over LAN.

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

- Supervised 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.
- Developed 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.
- Implemented 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++14.
- C++20 (Catch2, GoogleTest, doctest, GoogleBenchmark, CxxTest).
- Assembly (MIPS).
- MATLAB (Simulink).

Full Stack 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).
- Flutter (Provider, Bonsoir).

Other Programming Languages

- Python <=3.9 (Jupyter, OpenCV).
- Java 17 (OOP, design patterns).

Software Tools

- 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.