Proposal for the Design of a Centralised Web Application (PawfectMatch) to Connect Pet Owners with Pet Care Services in Singapore

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Submitted to—
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Contents

Executive Summary

Singapore holds a wide availability of pet care services, and in spite of that, pet owners and service providers continue to face inefficiencies in sourcing, comparing and booking these services. Pet owners often struggle with information scattered across social media, search results and word of mouth, while smaller providers face challenges in reaching their potential customers and in managing their bookings. These challenges highlight the need of a centralized and reliable platform that improves convenience for pet owners and visibility for service providers.

This project, titled *PawfectMatch* proposes the development of a web-based application that addresses this gap. The platform will enable service providers to list their offerings while pet owners can search, filter, compare and book with confidence. Core features will include user and provider accounts, a booking system with confirmations, and a reviews and ratings module to improve transparency and trust. The application will be designed as a scalable solution accessible on both desktop and mobile browsers.

The system will be developed using modern web technologies, adopting a layered architecture to separate presentation, business logic, and data. The project will be managed using agile-inspired practices with well-defined team roles, iterative sprints, and quality assurance processes. The outcome will be a secure, user-friendly platform that improves convenience for pet owners, expands visibility for providers, and supports the growth of Singapore's pet service ecosystem.

Statement of Problem

Pet care services in Singapore are widely available, ranging from pet grooming salons to day care centres and boarding facilities all across the island. The difficulty for pet owners is not in the existence of these services, but in identifying the ones that best fit their specific needs. Each owner has different priorities such as breed-specific handling, flexible hours, location, price, or proven reliability. However, information on these factors are fragmented across social media, search results, and individual websites, which makes it inconvenient to compare and book with confidence.

This lack of centralization also affects service providers. Smaller businesses that provide high-quality services, have limited online presence and struggle to attract new clients beyond personal networks and word-of-mouth. Meanwhile, larger providers typically run their own websites and booking systems which makes it harder for pet owners to view and compare different options side by side.

The Singapore pet care market is projected to reach USD 111.9 million in 2025, a 22% increase from 2020, with the average monthly spending per pet to be approximately SGD 195 (Ramos, 2025). Pet ownership is also on the rise, with licensed dogs increasing from about 70,000 in 2019 to 87,000 in 2020 (Lee, 2023). These figures highlight growing demands, yet the tools available to connect pet owners with pet services remain fragmented.

Objectives

This project proposes the design and development of a web-based application that connects pet owners in Singapore with pet care service providers. The specific objectives are as follows:

(1) Centralized platform consolidating various pet services

The system will serve as a single point of access for pet owners, replacing the inefficient process of searching across multiple platforms such as social media, Google searches, or messaging apps. By providing a central hub, it will improve convenience and ensure that pet owners can locate the services they need more quickly.

(2) Enable transparent comparison of services using filters for location, price, availability and type

The system will provide a search and filtering functionality so that pet owners can compare and identify suitable services efficiently. Filters should include the location, price, availability and type of services.

(3) Develop an accessible booking system that provides confirmation, reminders, service history, and incorporates reviews and ratings to support informed decision-making

The system will include a booking system where pet owners can request, confirm and track services. Providers must be able to accept or decline bookings, and the system will update statuses in real time. The booking system will also include reviews and ratings to allow pet owners to evaluate providers after completed bookings. Each review will consist of a 1 - 5 star rating and optional written and media feedback.

(4) Ensure system quality and scalability through a secure, user-friendly and secure design

The system will follow a layered architecture, separating presentation, business logic and data layers to improve maintainability. User authentication will be in place with role-based access control with sensitive data stored with encryption. The system will have a responsive web design to ensure accessibility on both desktop and mobile browsers.

These objectives define the project scope and explicitly exclude unrelated areas such as pet product sales or general e-commerce. This ensures that the team can focus its efforts on building a more reliable, scalable and user-friendly service platform.

Technical Approach

To achieve the objectives outlined in the previous section, the project will follow a structured and incremental plan of action. The system will be developed in iterative sprints, with each sprint delivering functional components that can be tested and reviewed by the team. This incremental approach ensures that the most important features such as pet service listings, search, filters, and bookings are prioritized and implemented first. The additional features such as reviews and ratings will then be developed in subsequent phases.

In order to carry out this plan of action, the first step is to understand the needs of the customers and translate them into system requirements. These needs will form the foundation of the system's functions, allowing the team to select the most appropriate technologies and architecture design.

Customer Needs

The needs of the customer were identified through observation of how pet owners in Singapore currently search for services and through informal feedback from owners and providers. Many rely on scattered sources such as Facebook groups, WhatsApp

chats, Tiktok and Google searches which makes it difficult to compare services. From these observations it is clear that owners need greater convenience, the ability to filter by location, price and availability and assurance that providers can meet specific requirements such as breed handling or safe environments. Trust and transparency also emerged as essential factors when deciding which service to use.

Service providers were considered as a second customer group. Informal feedback and observation of current practices show that many small businesses still depend heavily on word of mouth to attract clients. They also often manage bookings manually which is inefficient and restricts growth. These conditions point to a need for simple tools that allow providers to showcase their services, manage availability and build credibility with potential customers.

Taken together, the observations highlight shared needs across both groups. Pet owners and providers alike would benefit from a centralized platform where services are listed clearly, bookings can be confirmed easily and transparent information is available.

Target Specifications

The specifications of the proposed system are defined to address the needs of both pet owners and service providers. The application will be web-based and accessible on both desktop and mobile browsers to ensure ease of use and scalability.

A core specification is the ability for users to search and filter services by location, price and availability. To further improve convenience, the system will include a booking feature with confirmation of appointments and reminders may be considered if they fall within the project scope.

Separate accounts will be provided for the two main user groups. Pet owners will be able to create profiles, view past bookings and submit reviews. Service providers will be able to list their services, manage availability and update pricing. A review and rating system will also be included to provide transparency and help owners make informed decisions while enabling providers to build credibility.

To keep the project scope clear and achievable, the system will focus on pet services such as grooming, boarding and day care. Features related to pet product sales or other e-commerce functions will not be included. This limitation ensures that resources are directed toward delivering a reliable and user-friendly service platform.

Technology Consideration

The proposed system will be implemented using modern web development tools and frameworks to ensure scalability, maintainability, and efficiency. Each technology

has been selected based on its suitability for the project's objectives and the team's skillset.

For the frontend, the system will be developed using React, a widely adopted JavaScript framework. It will be paired with TypeScript to provide static typing, which improves code quality and reduces runtime errors. The application will be built using Vite, a modern build tool that offers hot-reloading and efficient development workflows.

For the backend, the system will use FastAPI, a Python framework for building RESTful APIs. It provides asynchronous request handling, automatic generation of OpenAPI documentation, and strong integration with Python type hints, making it ideal for building scalable and maintainable server-side logic.

For data storage, the system will utilize PostgreSQL, a robust relational database management system. Database interactions will be managed using SQLAlchemy, an Object Relational Mapper (ORM) in Python, which simplifies database operations and ensures clean separation between data and application logic.

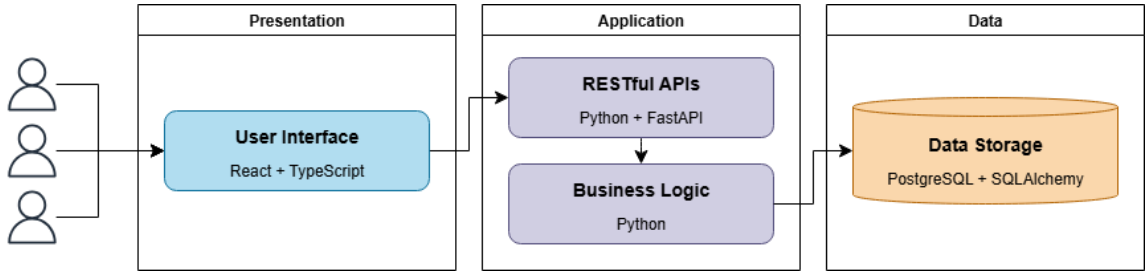
Finally, code quality will be maintained using tools such as ESLint and Prettier for code formatting, linting and type checking. These tools enforce consistent coding standards and reduce the likelihood of errors.

Technology	Description
Vite	Frontend build tool for faster development and more efficient bundling of the application.
React	Core framework for building a component-based, responsive user interface.
Typescript	Type-safe code for better tooling and large-scale development.
Python	Programming language used for backend logic and API development.
FastAPI	High-performance Python framework for building RESTful APIs with async support.
PostgresSQL	Relational database for storing structured data to be used in the system.
SQLAlchemy	ORM for database interaction enabling efficient and flexible database access.
ESLint + Prettier	Tools for linting and formatting to enforce consistent code styles.
Docker	Containerization platform to run frontend, backend, and

	database in isolated but integrated services.

System Architecture/Platform

Tool/Platform	Description
Git	Distributed version control for tracking changes in project files. Allow coordination and collaboration of work within the team.
GitHub	Remote repository for software development and version control using Git. Provides access control, software feature requests, continuous integration and code reviews.
npm	JavaScript package manager and script runner. Allows the team to download and manage online dependencies.
Visual Studio Code	Primary IDE for development that includes support for debugging, syntax highlights, code refactoring and Git. Also has extensions for ESLint/Prettier, Python and Docker.
pgAdmin	GUI to inspect/query PostgreSQL schemas, tables and data used by the system.
draw.io	Tool to create/edit system diagrams for documentation. Diagrams include flowcharts, UML diagrams and more.



The system will adopt a Layered Architecture, which separates the system into distinct layers for maintainability and clarity. The presentation layer contains the user interface that runs in the browser and communicates with the backend APIs. The application layer is responsible for exposing REST endpoints, handling user requests, and fetching data from the database. The data layer persists data required and used by the

system. This separation of concerns enables parallel development, simpler testing and easier scaling if ever needed.

Project Management

The project will follow an Agile methodology ensuring flexibility, iterative development and continuous feedback integration. Work will be organized into sprints, each lasting approximately two weeks to ensure that features are developed incrementally and can be tested and refined based on feedback given by involved parties. This approach allows the team to adapt to changes in requirements while ensuring steady progress toward the final end product.

To manage tasks, the team will utilize JIRA as the task assignment and tracking tool. This allows backlog items to be prioritized, assigned, and monitored, ensuring transparency and accountability. Weekly stand-up meetings will also be held to review progress and resolve issues. Each sprint will conclude with a short review to identify improvements for the next sprint cycle.

The project schedule is shown in the Gantt chart below which maps the major tasks and deliverables against an estimated timeline. Project tasks have been identified and given respective appropriate start and end dates.

Figure 1: Gantt chart for the project. The solid bars indicate the portions of the tasks that we have accomplished. (Do refer to the PawfectMatch_GanttChart.png on GitHub for a better view)

Deliverables

The deliverables of this project demonstrate the team's incremental progress toward the final end product. The early deliverables consist of documentation, including the Project Proposal, Use Case Model, System Requirement Specification (SRS), and Quality Plan. These documents establish the project scope, requirements, and quality standards.

Subsequent deliverables focus more on planning and prototyping. These include the Project Plan, Risk Management, and the Prototype Demonstration with supporting code and documentation. These deliverables ensure the development is guided by clear priorities and that potential risks are identified early.

The deliverables in the later stages will focus more on engineering practices. The team will provide a Design Report on Software Maintainability, Configuration Management Plan, Change Management Plan, and a Release Plan. These documents will ensure that the system is maintainable, version controlled, and deployed systematically.

The final deliverables include the Test Plan, Test Cases with Coverage Report, and Presentation Slides, as well as a complete GitHub repository containing all the code and documentation needed for submission. These final deliverables will help confirm the system's quality and usability.

A more detailed timeline for the deliverables are as follows:

Deliverables	Estimated Completion Date	Actual Dateline
Project Proposal	07/09/25	09/09/25
Use Case Model	07/09/25	09/09/25
System Requirement Specification	21/09/25	23/09/25
Quality Plan	21/09/25	23/09/25
Project Plan	05/10/25	07/10/25
Risk Management	05/10/25	07/10/25
Prototype Demo, Codebase, Documents, slides	05/10/25	07/10/25
Design Report on Software Maintainability	19/10/25	21/10/25
Configuration Management Plan	19/10/25	21/10/25
Change Management Plan	19/10/25	21/10/25

Release Plan	19/10/25	21/10/25
Presentation Slides	02/11/25	04/11/25
Test Plan	02/11/25	04/11/25
Test Cases and Requirement Test Coverage Report	02/11/25	04/11/25
Github:All documents checked in	02/11/25	04/11/25

Budget

The estimated budget for the project covers personnel salaries, equipment, software and operational cost necessary for the successful development and deployment over a 3 months period.

Item	Supplier	Quantity	Unit Price	Total
Labour Costs				
Project Manager	-	1	$7,000/month	$21,000
Team Members	-	6	$4,500/month	$81,000
Equipment Costs				
Laptops	Dell	7	$1,300	$9,100
Printer	HP	1	$1,000	$1,000
Software Costs				
Design Services	Figma	1	$100	$100
Website Hosting	Google	1	$100	$100
Workspace Costs				

Office rental	NTU	1	$5,000	$5,000
Total				$117,300

Communication and Coordination with Sponsor

Main communications and coordination with the sponsor will be conducted through formal email updates, supported by virtual meetings when required. The Project Manager will serve as the primary point of contact and will be responsible for preparing and sending structured updates.

A monthly progress report will be sent to the sponsor, summarizing work completed, upcoming tasks, and any risks or challenges encountered. These updates will also be shared with all team members to ensure transparency. If feedback or approval is required, the report will explicitly include the request for it.

In addition to the monthly reports, urgent issues or clarifications will be addressed through Zoom meetings, which will be scheduled within 5 working days by the Project Manager. These meetings will be attended by relevant team members depending on the discussion topic.

Routine communication within the team will be done through Telegram for direct communication and JIRA for task tracking. However, only formal deliverables, reports and sponsor communications will be shared via email and virtual meetings. This ensures that all sponsor communication remains professional, consolidated and easy to track.

Team Qualifications

The project team consists of seven members with complementary skills spanning project management, development, quality assurance, and release management. The full resumes of each team member is provided in Appendix A.

Name	Experience
Chan Zi Jian (Project Manager)	Zi Jian has experience in leading similar projects in the past and also managing cross functional teams. He has successfully delivered projects on time and met quality standards.
Chloie Tan Yue Yun (Lead Developer/ Release Engineer)	Chloie has a wide experience in full stack development and software development lifecycles. She also has experience in release engineering practices such as version control

	workflows, automated builds and continuous integration.
Anthony See Teck Ho (Frontend/Backend Developer)	Anthony has prior experience developing applications using React and integrating them with backend services through REST APIs. He also has experience in database modelling and writing backend logic in Python.
Do Quang (Frontend Developer)	Quang has experience in UI/UX focused projects, creating responsive and user-friendly interfaces. He has applied frontend frameworks such as React and used design tools like Figma for prototyping and wireframing.
Tan Chong Yao (Backend Developer)	Chong Yao has much experience in backend development and database-driven applications. He has worked extensively with Python frameworks to implement RESTful APIs and designed relational database schemas.
Nelly Nurelda Binte Zulkiflee (QA Manager)	Nelly has a background in test planning and quality assurance in academic projects. She has experience in structured testing methodologies, including writing comprehensive test cases and performing acceptance testing.
Athena Choo Ying Suan (QA Engineer)	Athena has experience in quality evaluation and verification. She is familiar with documenting test results systematically and following up on fixes to ensure issues are properly solved.

References

Lee, L. (2023, July 5). The Big Read: “Part of the family” - the rising status of pets among households and what it means for society. CNA. https://www.channelnewsasia.com/today/big-read/pets-part-family-rising-status-big-read-3569031

Ramos, J. (2025, March 5). Singaporeans pampering ‘fur kids’ spur pet care market boom. Retail Asia. https://retailasia.com/exclusive/singaporeans-pampering-fur-kids-spur-pet-care-market-boom

Appendix A: Résumés of Team Members

Chan Zi Jian | **Mobile No.: +65 91252158**
| Email: chanzijian00@gmail.com | www.linkedin.com/in/chanzijian | https://github.com/zijian980

EDUCATION

Nanyang Technological University, Singapore Aug 2023 - Dec 2026
Bachelor of Computing in Computer Science
- Relevant modules: Software Engineering, Object Oriented Design & Programming, Operating Systems, Data Structures & Algorithms, Computer Organisation & Architecture, Introduction to Databases

Ngee Ann Polytechnic, Singapore Jan 2018 - Dec 2021
Diploma in Electronics and Computer Engineering with Minor in Business Management
- Relevant modules: Application Programming, Object Oriented Programming, Computer Systems & Architecture

Institute of Technical Education, Singapore Jan 2016 - Dec 2017
Higher Nitec Certification in Electronics Engineering
- Specialised in Marine Electronics. Relevant modules: Microcontroller programming

SKILLS

- Programming languages: C, C++, C#, Python, JavaScript, Java, SQL
- Framework/Tools/Platform: React, React-Native, Vite, Expo, Appwrite, TailwindCSS, Git version control
- Soft skills: Problem solving, Teamwork
- Languages: English, Chinese

ACADEMIC PROJECT

Nanyang Technological University Aug 2024 - Dec 2024
Software Engineering Project – PetBuddy (Group Project)
- Completed full software development lifecycle and led a team of 5 to design and develop an application from scratch.
- Co-authored comprehensive technical documentation for design, implementation and user onboarding.
- Engaged extensively in front-end development using React and NextJS.
- Integrated third-party APIs for real-time data updates and external functionality.

EXPERIENCE

Continental Automotive Mar 2020 - Aug 2020
Embedded System Engineer Intern
- Contributed to the full product development lifecycle, from research and prototyping to hardware assembly, testing, and programming: C++ on Arduino and Python on Raspberry Pi.
- Collaborated with a team of interns to adapt C++ codebase to support multiple hardware variants with differing functional requirements.
- Worked cross-functionally with mechanical, electrical and software teams to develop and deliver prototypes.
- Updated and refined technical documentation, including user manuals and training materials for internal stakeholders
- Researched and analyzed opportunities to repurpose existing display technologies for dashboard systems, contributing to potential cost savings and production efficiency.

VOLUNTEER AND LEADERSHIP EXPERIENCE

Metropolitan YMCA Singapore Jun 2018 - Jun 2018
Student Volunteer
- Manage a team of 10 volunteers to provide cleaning services tailored to elderly residents, including detailed vacuum, meticulous dusting, and deep cleaning of kitchen and bathroom areas, enhancing overall cleanliness and comfort of homes.
- Performed repairs and maintenance of household appliances, improving quality of life for elderly residents.

HOBBIES & INTERESTS

- Sports Jogging, Pool
- Interest: Personal finance

Chloie Tan Yue Yun

UNDERGRADUATE | COMPUTER SCIENCE
+65 83606767 | chloie.tan.ct@gmail.com | ctan265@e.ntu.edu.sg

EDUCATION

Nanyang Technological University, Singapore August 2022 – 31 January 2026 (Expected)
Bachelor of Engineering in Computer Science

Singapore Polytechnic, Singapore April 2019 – March 2022
Diploma in Information Technology (Software Development)
Diploma with Merit, Cumulative GPA: 3.93/4.00

WORK EXPERIENCE

Binance May 2025 – Present
Frontend Developer Internship

- Developed and maintained frontend features, improvements, and bug fixes using **React** and **Vue.js** for enhanced user experience and application performance
- Participated in Agile workflow with **daily stand-ups** and **bi-weekly sprint reviews**
- Managed tasks and progress using **JIRA**, ensuring timely updates, prioritization and sprint alignment
- Worked through **full development lifecycle**: Implementation, Code Review, QA Testing, Debugging, Deployment

KLASS Engineering and Solutions Pte. Ltd. June 2024 – December 2024
Web Developer Internship

- Developed and completed frontend and partial backend features for four distinct projects, each under a different supervisor, while maintaining contributions to the main codebase
- Utilized **TypeScript, React, and Material UI** for frontend development and **FastAPI, Python** for backend tasks
- Designed and revamped user interfaces using **Figma**, ensuring modern and intuitive user experiences
- Wrote and executed test scripts for both frontend and backend using **Playwright** and **unittest**
- Participated in an **Agile SCRUM** workflow, including daily stand-ups, biweekly sprint reviews, and monthly meetings

ACADEMIC PROJECTS

Final Year Project – Person-Centered Care for Dementia Patients January 2025 – Present

- Developing **both frontend and backend** components for a web application using **React**, focusing on implementing unimplemented pages with robust authentication mechanisms
- Writing comprehensive end-to-end test cases to ensure application reliability and performance
- Handling deployment to the server, managing continuous updates, maintenance, and bug fixes throughout the development cycle

Final Year Project – IndustrialRecruits October 2021 – February 2022

- Led database development efforts, collaborating closely with team-mates to optimize the PostgreSQL database through the Prism ORM for enhanced data integrity and performance
- Implemented comprehensive unit and integration testing by employing Jest to ensure reliability through minimizing risks of undetected defects and unexpected behaviours

SKILLS

Technical Skills JavaScript | TypeScript | React.js | React Native | Node.js | MySQL | PostgreSQL | NoSQL | GIT
Python | Scala | Vue.js | C# | C++ | HTML | CSS | Java | AWS | Linux | Excel | Angular

Additional Skills Problem Solving | Teamwork | Quick Learner | SCRUM Framework | Full-stack Development
Continuous Integration/Continuous Delivery

Languages Proficient in English and Chinese

Anthony See |

+65 88669917
anthonysee.t.h@gmail.com

EDUCATION

2023 – 2027 Bachelor of Computer Engineering (**Nanyang Technological University**)
2018 - 2020 Diploma in Computer Engineering (**Singapore Polytechnic**)

- Director's honour roll (2019)

Graduating CGPA: 3.97 /4

SKILLS AND KNOWLEDGE

SQL

C/C++

- Able to design and create fairly complex and expansive program
- Experience in working collaboratively in an Agile environment
- Software engineering and documentation
- Application of Computer science knowledge

Java

- Mobile application development with real world application in the Bluetooth LE space
- Application of aesthetically designed product features

C#

- Could create graphical user interfaces and simple endpoint programs

MS Office

- Can use MS Word and MS PowerPoint efficiently
- Worked with excel and VBA Macro programming

Assembly Arduino

- Able to program complex programs to automate tasks

Language

- English and Mandarin Chinese. Spoken and written.

EXPERIENCE

2019 - 2020 Internship at GovTech

SIOT Software development intern

- Partaken in rapid creation and first iteration of the TraceTogether Token during COVID-19 pandemic
- Created provisioning tool for Bluetooth LE
- Tested Bluetooth LE capability of smart lamp controllers installed in Gardens By the Bay
- Code quality discussions and code reviews done with full-timers

CCAS AND HOBBIES

Taekwondo – Black belt

- Assisted master manage parts of training regime
- Taken part in a few competitions, such as inter school taekwondo competition
- Helped up to 20 underclass men in training
- Organized for Freshie training camp, and some other minor events

3D Printing and CAD Model design

- 3D printing repair parts for broken household items
- Designed and printed modification parts for the Neptune 4 Plus 3D printer

Tan Chong Yao | Mobile No.: 92331985 | Email: tan.cy01@outlook.com | GitHub: github.com/mahopon

EDUCATION

Nanyang Technological University, Singapore Aug 2023 - Jul 2027
Bachelor of Computing, Computer Science

Nanyang Polytechnic, Singapore Apr 2017 - May 2020
Diploma with Merit in Multimedia & Infocomm Technology

PROJECTS

Parkit! – Full-Stack Car Park Availability System (Group Project)
Tech Stack: React, Flask, SQLite, Mapbox API
A web app providing data about carpark availability at a given time, providing routing to said carpark

- Built and developed RESTful API using Python and Flask
- Created database schema and implemented queries for SQLite
- Collaborated with a group of 6, using Git for version control and Agile practices for iterative development

Marvel Explorers – Marvel Character CRUD Web App
Live Demo: tcyao.com/marvelexplorers
Tech Stack: React, Golang http with Gorilla Mux, Redis, PostgreSQL, Docker
A web app that allows users to browse through Marvel Comics character data, exploring characters that they may like and find related literature

- Built frontend components for searching and displaying character related information
- Created appropriate database schemas in PostgreSQL and broke down Marvel API response into appropriate records using Python's Requests and Psycopg modules
- Developed Golang backend to handle API calls using Gorilla Mux, apply logging middleware, and retrieve database records using pgx, accessed via Axios from the frontend, caching frequently fetched data on Redis
- Utilized Docker to containerize frontend, backend, and database on deployment (DigitalOcean droplet) environment, reverse proxied by NGINX

EXPERIENCE

Emplity May 2025 – July 2025
Software Engineer Intern

- Built and deployed a FastAPI inference service to serve predictions from an MLP model on AWS Lightsail
- Implemented new features and resolved bugs in Next.js frontend for the company's core product
- Developed new API endpoints and optimized ORM usage in Django Rest Framework backend, validating improvements through Django-Silk profiler
- Identified and fixed backend performance bottlenecks and load issues using Locust for load testing and Memray for memory profiling
- Collaborated using Git for version control and code reviews in a team environment

NCS Pte Ltd Mar 2019 - Aug 2019
Software Quality Assurance Intern

- Conducted end-to-end and regression testing of digital processes, ensuring a seamless experience and optimal functionality for clients
- Collaborated with cross-functional teams, including developers, functional and customer-facing teams, to ensure rigorous testing and alignment with project specifications, resulting in improved product quality
- Constructed detailed test cases to document bugs. streamline issue tracking, and improve resolution times, leading to resolution of critical and minor bugs

SKILLS

Programming languages: JavaScript/TypeScript, Go, Python, Java
Query languages: SQL
Technical Skills:

- Software Development: SDLC, Agile, Scrum, Version Control (Git), API (REST)
- Frameworks: React.js, Next.js, Flask, Echo (Go), Django Rest Framework, FastAPI, Spring Boot
- Databases: PostgreSQL, SQLite, MongoDB, Redis
- Tools: Postman, NGINX, Docker, psql, Locust, Grafana, Prometheus + Node-Exporter

HOBBIES AND INTERESTS

Gaming, Custom PC and mechanical keyboard building. Homelab (Learning k3s/k8s, self-hosting services w/ Docker, monitoring with Grafana & Prometheus)

Quang | Mobile No.: +6581447376 | Email: quangp06102004@gmail.com

EDUCATION

Nanyang Technological University, Singapore Aug 2022 - May 2026
Bachelor of Computer Engineering

- Relevant modules: Computer organisation and Architecture, Data structures and Algorithms, Object Oriented Design and Programming, Operating Systems, Computer Network, Software Engineering.

ACADEMIC PROJECT

Nanyang Technological University Sep 2023 - Dec 2023
Object Oriented Design and Programming

- Designed a Camp Application and Management System (including user accounts, camp registration, scheduling, camp information management, and administrative functionalities) and implemented it using Java.
- Composed a report to analyze application of OOP concepts in the source code and their impacts on system efficiency.
- Tested and completed application with all required functionalities working as intended; deployed design patterns to achieve SOLID design principles.
- Enhanced management capabilities and improved camp experience for both students and administration through an integrated and efficient platform.

Nanyang Technological University Aug 2022 - Oct 2022
Data Science and Artificial Intelligence

- Developed a stroke prediction system in Python using a dataset of 5,110 patient records, involving data extraction, resampling, data visualization, and implementation of logistic regression and neural network models, achieving 74% accuracy and 76% sensitivity with logistic regression.
- Composed a comprehensive 25-page report analyzing 8 data visualization techniques and identifying 5 significant statistical associations ($p < 0.05$), demonstrating their impact on stroke prediction models and the effectiveness of machine learning approaches.
- Tested and finalized prediction models over 100 iterations, applying resampling methods (Random Oversampling, SMOTETomek, SMOTEENN) to address class imbalance, resulting in a 5% increase in recall and achieving 80% recall in neural network models despite class imbalance challenges

CO-CURRICULAR ACTIVITIES

Freshmen Orientation Camp Jun 2023 - Aug 2023
Programmes Committee Member

- Planned games and camp activities for 200 freshmen to encourage interaction and bonding
- Trained 30 camp volunteers on facilitation skills during a half day workshop to enhance ability of performing camp activities safely

SKILLS

Technical skills

- Knowledge of Data Structures & Algorithms, Object Oriented Programming
- Python, C/C++, Java
- MySQL, git/Github,

Soft skills: Learning and adapting to new technologies, collaboration in projects. Other skills: Zoom, Google Meet, Microsoft Teams, Microsoft Office.

LANGUAGE

English.

NELLY NURELDA **ZULKIFLEE**

Singapore
+65 90491767
nellyzulkiflee@gmail.com

EDUCATION

Bachelor of Engineering in Computer Engineering | Nanyang Technological University
AUGUST 2022 – JUNE 2026 (EXPECTED)

Diploma in Multimedia and Infocom Technology | Nanyang Polytechnic
APRIL 2019 – JULY 2022

EXPERIENCE

System Automation Intern (Work-Study Degree) | Hoya Electronics
MAY 2024 – PRESENT

- Built end-to-end solutions using Microsoft Power Platforms to digitize internal workflows, reducing manual effort by ~30%.
- Automated approval and notification processes, cutting turnaround from several days to <1 day.
- Designed and maintained SharePoint sites/lists as centralized hub for requests and records.
- Partnered with engineers and managers to refine requirements and drive adoption across departments.

Quality Assurance Intern | Anacle Systems
MARCH 2021 – SEPTEMBER 2021

- Designed and executed test cases, improving testing efficiency by ~15%.
- Automated and optimized test scripts, ensuring consistent and reliable results.
- Collaborated with developers to enhance test strategies, reducing post-release defects by ~20%.
- Supported post-release testing, ensuring smooth deployments and timely issue resolution.

PROJECTS

Final Year Project - Full Stack Workflow Automation Web Application | Hoya Electronics & Nanyang Technological University
AUG 2025 - PRESENT

- Developing a React + TypeScript frontend and Firebase backend (Firestore, Auth, Hosting) to digitize project request, approval, and tracking processes.
- Building role-based access, change request handling, and audit trails with real-time updates, user testing, and documentation to improve Hoya's project management efficiency.

SKILLS

Programming: C, C++, C#, Java, JavaScript, Python, PHP, Dart
Databases & Web: SQL Server, PostgreSQL, Firebase, React, TypeScript
Tools & Practices: Git/GitHub, Tableau, Microsoft Power Platforms, UiPath, SharePoint, Agile (Scrum)

CERTIFICATIONS

Professional Scrum Master I (PSM 1)
Issued by Scrum.org, March 2022, Singapore

- Certified in understanding Scrum principles as described in the Scrum Guide and applying them in Scrum Teams.
- Proficient in applying Scrum practices to foster effective collaboration and productivity within Scrum Teams.

ATHENA CHOO

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OBJECTIVE

Computer Science student with a minor in Business at Nanyang Technological University, proficient in C, Python and Java. Quick thinker and strong collaborator, eager to deepen technical expertise while exploring interdisciplinary growth.

EXPERIENCE

Publicity Director, NTU Harmonix **Aug 2024 - Aug 2025**

- Managed social media platforms, including Instagram and YouTube, to promote events and enhance audience engagement.
- Created content e.g. Posts, Stories and Videos for said platforms.
- Directed creative vision and branding for publicity materials to maintain a strong public presence.

E-Math Tutor and Student Caretaker, Mighty Thinkers Student Care and Learning Centre **Feb 2023 - June 2023**

- Taught Mathematics and Elementary Mathematics to secondary students, clarifying doubts and reinforcing syllabus understanding.
- Provided afterschool care for students (ages 7-12), assisting with homework and primary school curriculum.
- Reviewed PSLE papers, addressing questions to enhance comprehension.

PROJECTS

NTU Deep Learning Week Hackathon, Best in Track for Business Intelligence **Mar 2025**

- Developed a real-time system for Bosch Rexroth with dashboard, workload optimization, and smart alerts to streamline operations.

Kamacho, NTU Innovation Lab, Student Entrepreneurship Programme **Feb 2025**

- Assisted in developing business structure and strategy while contributing to front-end app development.

SKILLS

Programming (C, Python, Java, Pandas)	Social Media Management (Instagram, content creation)	Quick Thinking and Problem-Solving
Familiar with OpenAi API	Digital Marketing & Publicity	Adaptability and Willingness to Learn

EDUCATION

Bachelor of Computer Science with a Minor in Business **2023 - 2027**

Nanyang Technological University

- **Special Projects**: University Well-Being Hackathon (2nd Runner-Up), CCDS Student Entrepreneurship Programme, 3rd Kumar Sustainability and Innovation (Participant), SMU BIA Hackathon (Participant)
- **Coursework:** Object-Oriented Programming, Operating Systems, Marketing in the 21st Century

ADDITIONAL INFORMATION

- **Languages:** English, Mandarin.
- **Certifications:** PSLE, O Level, A Level