Ryan Teo

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Projects

Wayfare – Hotel Booking Website (WIP) • [View Site] • [GitHub] MAY 2025 – PRESENT

- **Coordinated a team of eight** and **led the technical development** of a fully featured hotel booking platform, designed in **Figma** and architected using **React, TypeScript** and **Vite** for the frontend and **NestJS** in the backend.
- **Developed key pages and user flows**, including the landing page, search results, and login/register flows, using **Mantine UI** for rapid prototyping and **TanStack Router** for client-side routing.
- **Integrated frontend with backend APIs** using **TanStack Query + Axios** for performant data fetching and caching, and **Zod** for form validation and robust data handling.
- **Optimized** frontend performance with **lazy loading**, **asset compression**, and **route-based code splitting**.
- Implemented **unit, integration, and end-to-end tests** using **Vitest**, **React Testing Library**, and **Playwright** to enforce code correctness and catch regressions early during development.
- Set up modern dev workflows and **CI/CD pipelines**: automatic deployments with **Cloudflare Pages**, continuous integration with **GitHub Actions** for builds and tests, and code quality enforcement using **Husky**, **lint-staged**, **ESLint**, and **Prettier**.
- Built interactive UI features across the stack: **React-Leaflet** for map-based search, **Three.js/R3F** + **GLSL** shaders for landing page visuals, and **React-Spring** for UI animations and login/register page transition**.**
- Set up **GitHub Projects** for a Kanban board workflow, adopting **Agile** principles for iterative delivery and shared task ownership.

Interactive 3D Portfolio Website • [View Site] • [GitHub]

- Created an immersive 3D virtual workspace with **React Three Fiber (R3F)**, **Three.js** and custom **GLSL** shaders.
- Architected a modular, type-safe codebase with **TypeScript** and **React**, enabling reusable components and feature expansion.
- Created particle effects using noise functions, **optimized runtime performance** with texture baking and GLTF model streaming.
- Embedded a live internal website, which was built with **HTML**, **CSS/SCSS** & **JavaScript**.

Animation Gallery • [View Site] • [GitHub]

- Architected with **React** and **Vite**, a personal library of custom UI micro-interactions and effects, built using **Framer Motion** for smooth motion and **Tailwind CSS** utility classes for rapid styling and consistency.

WebGL Dissolve Shader • [View Demo] • [GitHub]

- Custom **WebGL** animation with **GLSL shaders** for dynamic content reveals, using shader injections for advanced UI transitions.

Real-Time Audio Visualizer with WebGL • [View Demo] • [GitHub]

- Built a real-time audio visualizer with Web Audio API, Canvas, and custom **GLSL** shaders for waveform and spectrum rende ring.

GitHub Commit Activity Dashboard • [View Demo] • [GitHub]

- React app to visualize repo activity using **Recharts** (**D3.js**-based), with **TanStack Query** + **Axios** for data fetching and caching.

ArXiv Semantic Search Engine • [GitHub]

- Built a lightweight semantic search engine for academic papers using core **Retrieval-Augmented Generation** (**RAG**) components.
- Designed **ETL pipeline**: **collected data** via ArXiv API, **preprocessed** abstracts, and generated **SentenceTransformer embeddings**.
- Persistent **vector storage** with **ChromaDB** and implemented **similarity search** for **natural language queries** via interactive CLI.
- Applied **NLP** techniques, **vector database** management, and **pipeline engineering** for scalable semantic retrieval.

Experience

Security Operations Center Intern @ Housing & Development Board SEP 2020 – FEB 2021

- Engineered end-to-end **Extract, Transform, Load (ETL)** pipelines in **Python** to ingest, cleanse and normalize cyber threat intelligence feeds, **boosting data coverage** for downstream analytics and **slashing manual data-tracking** effort.
- Redesigned and rebuilt the legacy domain fraud detection system in **Python**, building a fully automated pipeline and applying statistical analysis and rule-based heuristics to **reduce false positives** and **significantly cut analyst review time**.
- Authored documentation and user guides to support smooth onboarding and end-user adoption of the new systems.

Education

Bachelor of Engineering, Computer Science @ Singapore University of Technology and Design (SUTD) SEP 2023 – APR 2027

- 3.95 GPA

Skills

Languages: TypeScript • JavaScript • Python • Java • C# • C
Web: React • Vite • Node.js • Tailwind • Three.js • WebGL • Framer Motion • Mantine • ShadCN • GSAP • HTML • CSS/SCSS
Other: Git • GitHub Actions • Figma • PostgreSQL • MySQL
Concepts: REST APIs • Agile • Scrum • OOP • CI/CD • Functional Programming