David Hua

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Education

University of British Columbia, Vancouver, B.Sc in Computer Science August 2024 – April, 2027

- GPA: 4.33/4.33 (91.5/100)
- Honors: Faculty of Science International Student Scholarship, UBC Dean's Scholar

Technical Skills

- **Programming Languages:** Python (Pandas, Scikit-learn, TensorFlow, PyTorch, NumPy), Java, C, C++, JavaScript/TypeScript, SQL, R
- **Testing:** JUnit, unittest, pytest, SuperTest, chai, vitest, playwright
- **Database:** MySQL, Oracle, PostgreSQL
- **Web Development:** RESTful services, Node.js, Express, React, Tailwind css, HTML, CSS, JavaScript/TypeScript
- **Tools:** Docker, Git, GitHub, Basic Linux Environments, CI/CD Pipelines, Tableau, Postman
- **UI/UX Design:** Prototyping (Figma/Mastergo), Interview/Observation/Survey Design, Thematic Analysis, Usability Testing, Heuristic Evaluation
- **AI & Machine Learning:** Classical ML models (KNN, Ridge, Random Forest, ensemble methods, etc), Recommendation System, Time Series, Model Evaluation & Deployment

Technical Experience

Undergraduate Research Assistant, University of British Columbia, Vancouver January 2026 – Current

- Built a bilingual (English/Chinese) harmful-word dataset of 2,000+ unique terms by merging and deduplicating four public toxic-word corpora and one Chinese offensive-language dataset.
- Developed a **Python image generation pipeline** that renders harmful words as ASCII art across 8 fill modes.
- Evaluated 8 state-of-the-art **vision-language models** (GPT-4o-mini, Gemini, Grok, LLaMA, Qwen, etc.) via the **OpenRouter API** on over **50,000 image samples**.
- Applied **logistic regression** for detection-failure threshold estimation and **Cochran-Armitage trend tests** for monotonic detection decay across resolution scales.
- Demonstrated that semantically neutral fill characters and reduced resolution systematically evade VLM safety filters, with detection rates dropping below **15%** at scale $r \leq 0.3$ and $r \geq 0.6$ across **6 of 8 models**, exposing a concrete vulnerability in current **AI content moderation** systems.

Quality Assurance Intern, GHz Technology Ltd., Shanghai May – June 2025

- Supported UI design iteration in early stage of internship by adapting layouts based on evolving client requirements using **Figma**.
- Conducted independent end-to-end testing of a hospital mobile application utilizing **Agile** methodology.
- Designed and maintained 100+ structured test cases; identified 21 bugs and 4 usability issues, including 4 missed by the internal QA engineer.
- Collaborated with QA Engineers and developers to triage, report, and verify fixes using internal tracking tools.

Undergraduate Research Assistant, CUHK(SZ), Shenzhen January – July 2024

- Developed and implemented a web crawler to automatically retrieve ESG reports from corporate websites, enhancing data acquisition efficiency.
- Converted PDF documents into text, increasing data accuracy and reliability.
- Employed OpenAI's api to extract critical information from text, streamlining the data processing workflow.
- Designed prompts that reduced hallucination rate by 4%, strengthening research integrity.

Technical Projects

InsightUBC — Course & Facilities Data Explorer January – April 2026

- Built a full-stack web application enabling UBC Decision Support team to interactively query, filter, and visualize course and facilities data across departments and buildings.
- Developed a frontend with 4 **Recharts** visualizations using **React 18/TypeScript** and **Tailwind css**, enabling non-technical users to explore patterns across UBC departments and buildings.
- Collaborated on a full-stack REST API (**Node.js/Express + TypeScript**) with a custom query DSL supporting filtering (AND/OR/NOT), aggregations (GROUP BY, AVG/SUM/COUNT), and async ZIP dataset ingestion, serving 20+ endpoints.

Credit Card Default Prediction October – November 2025

- Predicted credit card default risk on 30,000 records by training and comparing 7 classification models, identifying repayment delay as the dominant predictor via SHAP analysis.
- Built and compared 7 classification models (Logistic Regression, Random Forest, XGBoost, LightGBM, etc.) on 30,000 credit card records to predict default risk.
- Engineered features from 6-month payment history and applied SHAP analysis to identify repayment delay as the dominant predictor.
- Communicated model findings, SHAP feature-importance insights, and data-quality caveats in a plain-language report designed for non-technical stakeholders, and deployed it as a static site via **GitHub Pages** (Click to view).

UBC Course Visual Planner Dec 2024 – March 2026

- Designed and delivered a full-stack UBC course planning tool using **React**, **Express.js**, **PostgreSQL**, **Redis**
- Conducted iterative user research through interviews and think-aloud observations, refining a **Figma** prototype across multiple cycles to reach a high-fidelity design before writing any code.
- Defined the full system architecture and authored detailed endpoint specifications in Markdown, serving as the source of truth for AI development.
- Applied **Test Driven Development** by orchestrating three parallel **Claude Code** agents to generate tests from specs, implement backend endpoints, and scaffold frontend from Figma designs via **MCP**, then validated output through automated (**Vitest**, **Playwright**) and manual end-to-end testing.

Other Experience

Undergraduate Teaching Assistant, University of British Columbia, Vancouver January – April 2026

- Led weekly lab sessions with two other TAs, breaking down complex programming concepts and debugging code collaboratively in lab sessions.
- Provided scalable technical support during office hour, creating reusable explanations for common challenges.
- Coordinated with teaching team to standardize rubrics and assessment workflows, ensuring consistent evaluation across multiple lab sections.

Finance Officer, CUHK(SZ) IEEE Student Branch, Shenzhen August 2023 – July 2024

- Designed and implemented a financial tracking system for a 200+ member organization, streamlining reimbursement workflows and ensuring policy compliance.
- Led cross-departmental initiative to automate IEEE membership fee reimbursements, coordinating between student branch and School of Science and Engineering to increase membership participation.