Changyu Chen

Portfolio Website: https://changyu123chen.github.io/Changyu_Website/
Cell: 226-201-2618

SUMMARY

★ Computer Engineering student with hands-on experience building **MVPs** in **full-stack web**, **embedded systems**, and **AI-driven** applications.
★ Fast learner with strong resilience under pressure, and a proven ability to meet deadlines.
★ Applied machine learning (Random Forest, KMeans), OpenAI APIs, and Whisper for NLP and media automation.
★ Experienced in mobile UI/UX (Flutter), embedded programming (STM32, Arduino), and 3D prototyping (Unreal Engine 5).
★ Experienced in Linux-based development, including web service configuration and port forwarding.

SKILLS

★ Languages: C++, C, Python, Java, Javascript, SQL, PL/SQL, Verilog
★ Web / API: React.js, Node.js, Express.js, HTML, CSS, RESTful APIs, OAuth (Google SDK)
★ Mobile: Flutter, Dart, Xcode Simulator
★ ML & AI: scikit-learn, OpenAI API & Whisper, FastAPI
★ Testing /QA: Playwright, Selenium, PL/SQL test case design, End to End Testing, Xcode Simulator
★ Embedded: STM32, Arduino, Real-Time OS(RTOS) Programming
★ Tools: Git, GitHub, VS Code, Xcode, Linux CLI, Unreal Engine, FFmpeg
★ UX & 3D: Interface Design, Responsive Layout, UE5 Blueprint

EXPERIENCE

Web Developer Intern -Dawnergy Technologies (Shanghai) Co Ltd

January 2025 - April 2025   Shanghai, China

- Built a full-stack auction-style platform under mentorship during internship downtime.
- Implemented bidding logic with lowest-unique-bid selection, auction progress tracking, and round-based participation.
- Developed **RESTful APIs** to handle user registration, bid submissions, and product management.
- Designed and queried **SQL** database tables to store user credentials, bids, and product data.
- Integrated **Google SDK** for **OAuth**-based login, supporting both Google and traditional authentication flows.
- Designed responsive user flows and implemented **UI** components using **React.js**, **HTML**, and **SCSS**
- Created end-to-end tests with **Playwright** to validate API functionality using **Postman**.
- Managed version control using **GitHub** with structured feature branches and regular commits.
- Planned for future deployment to **AWS** to ensure scalability and public accessibility.

Software Development Assistant - Skyline Technology Limited

January 2024 - April 2024   Accra, Ghana

- Set up and configured a **CentOS** server environment with user accounts and permissions.
- Integrated a solar application website into the system and mapped **server ports** for browser accessibility.
- Monitored and maintained website stability, ensuring continuous uptime and connection reliability.
- Troubleshot browser-specific accessibility issues and implemented **cross-browser compatibility** fixes.
- Communicated with international staff to provide regular updates on website performance and resolve technical issues.

IT QA Assistant - Ontario Ministry of Education

January 2023 - August 2023   Toronto, ON

- Resolved a critical website issue that caused submission failures related to funding parameters.
- Performed **SQL** testing and developed **Selenium** scripts to verify site functionality across key workflows.
- Generated **Python**-based diagnostic reports to support issue tracking and resolution.
- Collaborated with the development team to enhance site performance and stability.
- Trained incoming co-op students and new hires, contributing to team onboarding and operational efficiency.

Manulife - Web Application Designer - Waterloo Experience (WE) Accelerate Program

May 2022 - August 2022   Waterloo, ON

- Developed custom payment pages using **Node.js**, **React.js**, and R**ESTful APIs** for education service transactions.
- Integrated **PayPal** and **Alipay SDKs** to enable secure, multi-platform payment processing.
- Collaborated on responsive UI design using **HTML** and **CSS** to improve user experience.
- Tested and debugged API requests using **Postman** to ensure transaction reliability.

PROJECTS

Capstone Project   **March 2025 - Present**

Team Project · **Arduino** · **platformIO** · **C++** · **Computer Vision** · **Signal Encoding**, MVP
- Built an **Arduino**-based beacon to emit Gold Code light sequences for visual localization.
- Implemented **PWM** and **LFSR** logic to generate long, high-uniqueness codes across RGB LEDs.
- Synchronized multi-LED output for robust signal detection in noisy environments.
- Prototyped **MVP** system for future integration with computer vision pipelines.
- Collaborated with teammates to align embedded output with **CV** detection modules.

MirrorSelf – AI-Driven Habit Forecasting App   **May 2025 - Present**

Solo Project · **Flutter (Frontend**) · **Python FastAPI (Backend)** · **scikit-learn** · **AI simulation** · **MVP**
- Built an **MVP** mobile app with a **Random Forest**–based simulator to forecast user outcomes based on habits and traits.
- Generated synthetic labeled data and trained a **supervised model** for personalized predictions.
- Created a **FastAPI** backend and integrated prediction APIs with a multi-screen Flutter frontend.
- Applied interpretable AI techniques to enhance feedback and user self-reflection.
- Currently exploring **LLM** integration for tailored behavioral insights.

Paint by Numbers Generator (Python)   **November 2024 - Present**

Solo Project · Python · OpenCV · scikit-learn · Image Processing · KMeans Clustering
- Built an **MVP** tool to convert images into printable color-by-number templates using unsupervised learning.
- Applied **KMeans** to segment dominant color regions and assign numbered labels for coloring.
- Extracted contours with **OpenCV** and overlaid numbered masks for clean printable output.
- Enabled adjustable color granularity and resolution scaling to optimize clarity and usability.

TransformVideoAudioToTranscript – Automated Video-to-Text Pipeline   **May 2025**

Solo Project · **Python** · **ffmpeg** · **OpenAI Whisper** · **Automation**
- Built a **CLI** tool to extract audio from video using **FFmpeg** and transcribe it with OpenAI Whisper.
- Supported multiple model sizes to balance transcription speed and accuracy.
- Automated cleanup of intermediate files and saved transcripts in organized output folders.
- Designed a batch-processing pipeline with automated cleanup and organized output structure.
- Planning future extension to support subtitle formats and Docker-based deployment.

Personal Game Development   **August - September 2023**

Solo Project · **Unreal Engine 5** · **Blueprints**
- Built a **3D** Earth–Moon space scene in Unreal Engine 5 using **Blueprints**.
- Implemented dynamic lighting and rotational animation to simulate orbital motion.
- Demonstrated proficiency in scene assembly, lighting, and object animation within UE5.

ACADEMIC PROJECTS

Producer–Consumer via Shared Memory (C++).   **September - October 2023**

Course Project · **C++** · **Linux** · **Threads** · **PNG Processing**
- Solved a producer-consumer problem using shared memory in a **Linux** environment.
- Used semaphores and mutexes to prevent race conditions and ensure safe concurrent access.
- Extracted PNG strips from multiple websites, concatenated them, and generated a single output image.

Multithreaded Image Retrieval with Blocking I/O (C++)   **October - November 2023**

Course Project · **C++** · **Linux** · **Threads** · **PNG Processing**
- Implemented multi-threaded image retrieval from multiple websites using blocking I/O.
- Handled thread synchronization and parallel I/O to improve data fetching efficiency.
- Concatenated downloaded image strips into a single PNG output.
- Used Git for version control and submitted the project via GitLab.

EDUCATION

University of Waterloo   September 2021 - April 2026
Bachelor of Applied Science in Computer Engineering

AWARD

President's Scholarship, University of Waterloo, Waterloo, ON   March 2021
          Awarded for reaching an average between 90% and 94.9% in high school courses.