

# Vu Dinh

Software Developer | Business Impact Through Technical Solutions

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## Summary

Passionate software developer with hands-on experience designing and building full-stack applications from concept to production. Delivered a **25-30x efficiency improvement** through a payroll automation platform that reduced processing time from 1.5 hours to under 5 minutes. Eager to bring problem-solving skills and dedication to a collaborative team, and to grow as an engineer under experienced mentors at LotusFlare.

## Experience

### Full-Stack Developer (Self-Directed Projects)

September 2024 - Present

#### Project: Distributed Payroll Management Platform

- Built production-ready automation platform managing **complex California labor compliance** (overtime, meal penalties, split shifts), reducing processing time by **95%+**.
- Designed a stateless REST architecture using SQLAlchemy transactions to ensure strict ACID compliance and data integrity for multi-step financial operations.
- Architected three-phase workflow (resolution → review → export) using an **offline-first architecture** to ensure zero data loss during network interruptions.
- Designed single-interaction employee interface ensuring zero-friction adoption by non-technical users.

#### Project: Gaming Automation Framework

- End-to-end automation platform featuring FastAPI backend with constraint satisfaction engine, React SPA editor with real-time Pi testing, Flutter controller with Riverpod state management, and Raspberry Pi USB HID executor—all communicating via REST APIs with robust offline resilience.
- Engineered strategic subtraction randomization algorithm for undetectable input patterns with millisecond-precise USB HID injection, providing hardware-level control with comprehensive hot-swapping and autonomous polling capabilities.

#### Project: Digital Menu Display System (Small Business)

- Applied first-principles reasoning and A/B testing to define requirements in ambiguous environment: content organization, visual hierarchy decisions, legibility optimization, and hardware constraint navigation.
- Debugged and resolved real-world deployment issues: unexpected 4K 30fps vs 1080p 60fps output, frame jitter, and screen tearing—iterating through hardware and software solutions to achieve production stability.
- Deployed production infrastructure on GCP Compute Engine with nginx reverse proxy and Cloudflare SSL, currently hosting restaurant payroll system and online mobile menu.

Gained firsthand exposure to enterprise software inefficiencies (inventory, POS, payroll) in a high-pressure environment. Observing these challenges sparked my passion for building intuitive, user-centric solutions that simplify people's work.

## Foundational Principles

**First Principles Approach:** Independently derive algorithms like Dijkstra's to grasp underlying mathematical properties

**Pattern Recognition:** Focus on understanding core concepts rather than memorizing implementation details

**Analytical Depth:** Build strong problem-solving foundations through rigorous conceptual practice

## Technical Competencies

**Mobile:** Flutter/Dart, Riverpod

**Backend:** Python, FastAPI, SQLAlchemy

**Infrastructure & Tools:** Git, Raspberry Pi, GCP, AWS EC2, nginx, Cloudflare

**System Design:** Distributed Systems, REST APIs, Offline-First

## Education & Development

### Accelerated Self-Directed Development

*October 2024 - Present*

Engaged in intensive, focused skill development and system design, driven by genuine excitement for building practical, cross-platform applications with modern tools and rapid evolution as a systems thinker and problem solver.

### University of Washington

*2012 - 2016*

Coursework in Computer Science and Software Engineering (CSSE), including algorithms, data structures, and software engineering principles.