

# Fernando Lopez

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## Education

### University of Illinois Chicago (UIC)

Aug 2023 - Dec 2026

Bachelor of Science in Computer Science

Relevant Coursework Data Structures, Programming Practicum, Mathematical Foundations of Computing, Machine Organization, Languages and Automata, Programming Language Design and Implementation

## Technical Skills

**Programming Languages:** Python, C++, Java, Go, SQL, JavaScript

**Frameworks:** LangChain, React, Django, Flutter, Pytest, JUnit5

**Deployment Tools & API's:** Vercel, Render, Sanity, Brevo, EmailJS

**Development Tools:** Docker, Git, Linux, Vim, Firebase, PostgreSQL, SQLite, Figma, Maven, VS Code, Arduino IDE

**AI Models:** WatsonX

## Relevant Experience

### Dulce Tentaciones - Freelance Software Engineer

Jun 2025 - Aug 2025

- Directed the full SDLC for a local startup, delivering a responsive React application from requirements to deployment
- Engineered a scalable marketing pipeline using Brevo and EmailJS, capable of processing 1,000+ monthly customer orders without manual intervention
- Integrated Sanity CMS to enable non-technical content updates, reducing developer maintenance time by 100%

## Projects

### Digital Art Watermark Page (Python, Django, React, PostgreSQL, Figma, Javascript, Render, Vercel)

Aug 2025 - Dec 2025

- Engineered a secure, decoupled, full-stack permission system utilizing advanced data structures for digital rights verification
- Implemented a Merkle Tree architecture to ensure tamper-proof data integrity and permission verification
- Integrated Bloom Filters and Skip Lists to optimize performance, achieving  $O(1)$  existence checks and  $O(\log n)$  search speeds
- Designed the PostgreSQL schema and deployed the modularized architecture using Vercel (Frontend) and Render (Backend)

### RAG PDF Assistant - Michigan DevFest (6-Hour Hackathon) (Django, React, Docker, WatsonX)

Nov 2025

- Developed a context-aware RAG AI for document analysis using IBM WatsonX and LangChain within a 6-hour hackathon
- Engineered a containerized Django/Docker backend to efficiently handle PDF processing and vector embeddings, ensuring environment consistency
- Deployed a decoupled architecture via Render (backend) and Vercel (frontend), integrating Firebase for secure authentication and persistent data storage

### Cross-Platform Notes App (C++, Dart, Flutter)

Jun 2025

- Architected a cross-platform MVP using Flutter and Dart, delivering a single unified codebase for both iOS and Android deployment
- Architected a high-performance local data layer in Dart, achieving a verified throughput of 1.5M+ operations/second via rigorous automated stress testing
- Designed a scalable Object-Oriented architecture prioritized for memory efficiency, capable of managing an initial local data volume of 1 GB
- Implemented Firebase Authentication and Realtime Database to ensure secure user sessions and instant multi-device synchronization

### Smart Home System (C++, Arduino IDE)

Aug 2025 - Dec 2025

- Developed a smart home ecosystem integrating real-time motion lighting, alarms, and environmental sensors
- Built a wireless IoT network connecting multiple Arduinos via ESP32, Blynk, and NTP synchronization
- Boosted performance 75% and reduced latency by implementing non-blocking I/O for Wi-Fi modules

## Leadership & Activities

### Women in Computer Science - *Aspire To Inspire Mentor*

Sep 2025 - Present

- Led and guided two students through the development of personal web portfolios, advising on design, architecture, and deployment best practices
- Coordinated a collaborative team of four (two mentors, two mentees) to architect a real-time chatting application using Django and React
- Defined the initial scope and strategy for implementing AWS deployment and future cross-platform expansion to mobile
- Communicated technical insights and networking strategies, fostering a supportive environment

## Work Experience

### Computodt Inc

Aug 2024 - Feb 2025

- Translated complex programming paradigms into accessible K-8 curriculum, covering foundational logic such as loops, control flow, and variable types to build technical literacy for 20+ students per semester
- Directed hands-on engineering workshops utilizing microcontrollers (Arduino) and circuit logic to foster early proficiency in embedded systems and real-world software use cases

### Monterrey Security - *Event Security*

Jun 2025 - Present

- Coordinated logistics for large-scale events (60k+ patrons), collaborating with distributed teams to resolve critical incidents and ensure operational safety