

# Juan Enrique Ayala Zapata

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## EDUCATION

### Monterrey's Institute of Technology and Higher Education (Tecnológico de Monterrey)

Querétaro, MX

*Bachelor of Science in Computer Science, Minor in Cybersecurity*

*Expected: June 2027*

- **GPA:** 96.35/100 (3.9/4.0) | **Academic Talent Scholarship Recipient**
- **Relevant Coursework:** Data Structures & Algorithms, Object-Oriented Programming, IoT Implementation, Computational Thinking

## EXPERIENCE

### CTO & Co-Founder

February 2025 – Present

*Neural Harvest – AgTech Startup*

*Querétaro, MX*

- Selected for **Dedalus Break In Program** residency at The Residency and London Founder House in San Francisco, joining 20 founders from 13 countries in month-long AI startup accelerator
- Leading development of AI-powered precision agriculture platform combining satellite imagery analysis with proprietary ML crop simulation engines
- Architecting scalable microservices infrastructure processing multi-spectral satellite data with hybrid database systems and containerized deployment
- Managing cross-functional team implementing enterprise-grade RBAC, real-time IoT monitoring, and automated field communication systems

### Back-End Developer

March 2024 – May 2025

*ceams.co – Digital Agency*

*Querétaro, MX*

- Developed scalable back-end infrastructure using **Node.js** and **MySQL**, optimizing data collection and storage systems for client web applications
- Improved website performance by 40% through server-side optimizations, efficient database query implementation, and caching strategies
- Enhanced SEO performance and search engine visibility through technical optimizations, schema markup implementation, and page speed improvements

## PROJECTS

### TreeHacks - Sentinel AI Security Scanner | Python, Next.js, Gemini, Playwright, Supabase

February 2026

- Architected autonomous penetration testing platform deploying swarm of 10 specialized AI agents for concurrent web security scanning, achieving comprehensive vulnerability detection through coordinated reconnaissance, exploitation, and analysis phases
- Engineered Flask-based orchestration engine with **asyncio** coordination managing concurrent agent execution across Spider (attack surface mapping), SQLi/XSS fuzzing, CORS/header auditing, and autonomous **Playwright**-powered Red Team agent with observe-think-act loop
- Built real-time **Next.js 16** dashboard with **Supabase Realtime** event streaming, displaying live agent progress, findings, and severity-weighted security scoring (A-F grades) with **Gemini**-generated remediation reports including OWASP references and code-level fixes

### Prometheus - AI-Powered Recruitment Platform | Python, Flask, Next.js, Google Gemini 2.5, Firebase

October 2025

- Architected conversational AI recruitment system using **Google Gemini 2.5 Flash** with Agent Development Kit (ADK), implementing progressive filtering that maintains context across multi-turn dialogues for semantic candidate matching beyond simple keyword search
- Engineered full-stack platform with **Flask REST API**, **Next.js 15**, and **Firebase Firestore**, integrating **Twilio WhatsApp API** for 98% message open rates versus 20% email engagement, including CV parsing and automated job description generation
- Developed semantic matching algorithms with transferable skills analysis (Vue.js → React equivalence) achieving 0-100 compatibility scoring with detailed reasoning, reducing candidate discovery time from 3-5 days to 2 minutes

### Bloomby - Wildflower Bloom Prediction Platform | Python, Flask, TensorFlow, Google Earth Engine

October 2025

- Engineered ML-powered platform predicting wildflower blooms using **NASA satellite data** (MODIS, SMAP) with 31+ ecological features including spring phenology detection, growing degree days, and soil water stress analysis for biodiversity conservation and climate research
- Developed **Gradient Boosting classifier** achieving 0.72-0.85 ROC-AUC with advanced feature engineering combining spatial, temporal, and environmental variables across 73 years of historical climate data, including specialized cherry blossom model with ±3 days accuracy
- Built full-stack application with **Flask REST API**, **Google Earth Engine** integration, and interactive 3D globe visualization supporting global bloom predictions with 90-day forecasting capability for tourism and ecological planning

### Via Alta - Academic Enrollment Management System | Next.js, PostgreSQL, TypeScript

Feb – May 2025

- Developed comprehensive enrollment and schedule management system using **Next.js 15**, **React 19**, and **TypeScript** with automated course registration, built-in genetic algorithm for intelligent schedule generation with conflict resolution for professors, classrooms, and student schedules
- Designed **PostgreSQL** database with 10+ normalized tables and RESTful API architecture, deployed on **Heroku** with CI/CD pipeline, integrating multi-role authentication system with 80% reduction in manual processing time

## TECHNICAL SKILLS

**Languages:** Python, C/C++, JavaScript, TypeScript, SQL/MySQL, HTML/CSS, R, MATLAB

**Frameworks & Libraries:** Flask, Next.js, React, TensorFlow, Scikit-learn, Pandas, NumPy, Node.js, Express.js, BeautifulSoup

**Tools & Technologies:** Playwright, Supabase, Docker, Google Cloud Platform, AWS, Google Earth Engine, Git, PostgreSQL, Firebase

**Specializations:** AI Agent Systems, Penetration Testing, Cybersecurity, Machine Learning, Full-Stack Development, Real-time Systems, Web Security