

# Diego Abdo Velásquez

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## EDUCATION

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Tecnológico de Monterrey Campus Santa Fe | Mexico City

Aug 2022 - Jun 2026

B.S. in Computer Science and Technology Engineering: GPA 95 / 100

## EXPERIENCE

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Stride | Backend Engineer

Sep 2024 - Present

### 1. Distributed Point-of-Sale System

- Led the development of the backend for a distributed POS system serving 100+ retail stores using **NestJS** and **PostgreSQL**, supporting multi-branch inventory, sales processing, and offline-first operations.
- Architected bidirectional synchronization between stores and the central server through **REST APIs** and scheduled processes, ensuring eventual consistency and centralized data consolidation.
- Designed a high-complexity relational database (sales, multi-branch inventory, catalog, employees, customers), optimizing queries and bulk synchronization processes.
- Implemented **JWT** authentication with refresh tokens and role-based access control (**RBAC**), ensuring proper separation between user authentication and system-to-system communication.

### 2. Inventory Optimization & Redistribution System

- Developed an inventory optimization engine in **Python (FastAPI)** to calculate optimal transfers across 100+ stores based on historical sales, in-transit stock, and A/B/C classification.
- Implemented asynchronous processing with **Celery** and **Redis** for large-scale transfer simulations and file processing, preventing API blocking and improving scalability.
- Optimized complex **SQL** queries and **PostgreSQL** functions for efficient global inventory aggregation across large datasets.
- Built a **React + TypeScript** web application with interactive dashboards for transfer visualization, inventory metrics, and movement simulations.

### 3. Payroll Advance Fintech Platform

- Built the backend of a payroll advance fintech platform using **NestJS** and **Supabase (PostgreSQL)**, modeling employees, companies, pay periods, and financial transactions.
- Integrated external payment APIs (SPEI), implementing multi-layer validations and dynamic financial logic (limits, worked-day calculations, period-based restrictions).
- Implemented **RBAC** with custom guards and strict company-level data isolation.

## PROJECTS

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ICPC Mexico National Finals 2024 (Competitive Programming – C++)

Nov 2024

- Competed in the ICPC Mexico National Finals in Monterrey among the top university teams in the country.
- Achieved Top 100 nationally, solving complex algorithmic problems under strict time constraints using C++.

Multi-Agent Traffic Simulation (Python, WebGL, Flask) - [GitHub](#)

Oct 2024 - Nov 2024

- Designed a multi-agent traffic simulation using **Python** and Mesa, implementing BFS pathfinding with global memoization to reduce redundant computations and significantly improve performance.
- Developed a custom scheduler for intersection collision prevention and built a decoupled REST architecture with **Flask** connected to a real-time 3D WebGL visualization with smooth interpolation.

## SKILLS

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- **Programming Languages:** TypeScript, JavaScript, Python, SQL.
- **Technologies:** NestJS, Node.js, FastAPI, React, PostgreSQL, Supabase, Redis, Celery, TypeORM, Prisma.
- **Expertise:** Database Design, REST APIs, Authentication (JWT, RBAC), External API Integration.