

# HECTOR EDUARDO TOVAR MENDOZA

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## EDUCATION

### Tecnológico de Monterrey

Bachelor of Engineering in Robotics and Digital Systems

Expected June 2027

Monterrey, Nuevo León

- **Relevant Coursework:** Data structures and algorithms, Object-oriented programming, Computational architecture
- **Cumulative GPA:** 90/100

## WORK EXPERIENCE

### Software Engineer | Ventologix

React, Next.js, FastAPI, MySQL, Docker, GCP, Langraph, OpenAI | April 2025 – Present

- Architected a proprietary full-stack ecosystem using **React (Next.js)** and **FastAPI**, delivering real-time visualization that served as a **key market differentiator** instrumental in closing **40% of total revenue**.
- Engineered a database optimization strategy by implementing temporal partitioning on monolithic **MySQL** tables, which **reduced stored procedure execution time by 90%** and accelerated query lookups.
- Developed and deployed a containerized **AI Analytics Agent** on **GCP Compute Engine** using **Docker** and **Cloudflare Tunnels**, enabling secure, automated predictive insights for client data.

### Front-End & Mobile Developer | Einter

React, Kotlin, Firebase, MySQL | July 2025 – Present

- Developed a modular **React + Vite** dashboard for administrative staff to generate sales orders and track live inventory, replacing legacy paper-based tracking.
- Created a companion **Kotlin** mobile app for warehouse staff, implementing barcode scanning to validate stock entries against the web dashboard's records in real-time.
- Implemented database logic to register critical inventory events including **stock entries, exits, and spoilage**, ensuring end-to-end traceability of products.

## PROJECTS

### FrEDie: AI/AR Virtual Assistant

| Research with MIT | LangGraph, Python, Claude, Docker, Azure | November 2025 – Present

- Developed a **RAG-based adaptive agent** using **LangGraph**, implementing **conversation summarization** and structured persistence to optimize context retention and minimize database latency.
- Implemented an **adaptive tutoring engine** with **Human-in-the-Loop** workflows, dynamically adjusting content complexity based on **learning styles** while validating inputs via interactive questionnaires.
- Engineered a scalable, Dockerized backend on **Azure** to orchestrate the full lifecycle, utilizing **Cloudflare Tunnels** to securely route traffic between web clients and the **Claude AI** model.

### RoBoCupido: AI Matchmaking Agent

| T3 Stack, TypeScript, Gemini Pro, PostgreSQL, TypeScript | January – February 2026

- Engineered an interactive dating platform using the **T3 Stack (Next.js, tRPC)**, replacing static sign-up forms with a conversational AI agent that interviews users to determine compatibility.
- Built a stateful **information extraction pipeline** using Gemini Pro and TypeScript, designing an agentic workflow that dynamically retrieves user preferences (e.g., relationship type, hobbies) to generate structured "About Me" summaries.
- Implemented a matching algorithm that utilizes AI-generated user profiles to pair candidates, presented as a featured project for the university Valentine's Day showcase.

## RESEARCH

### RoBorregos Team

Research & Development Member

November 2024 – Present

Tecnológico de Monterrey

- Engineered a hybrid pose analysis pipeline utilizing **MediaPipe** for landmark extraction, **SVMs** for static state classification, and **LSTMs** for temporal sequence modeling, achieving **96% accuracy** in dynamic gesture recognition.
- Optimized Visual **Re-Identification (ReID)** architectures to address the "persistent identity" challenge, maintaining **93% tracking consistency** across heavy occlusions and crowded environments.
- Spearheaded research on **monocular depth decomposition** to synthesize high-fidelity 3D point clouds of **transparent objects**, enabling an **xArm6** robot to autonomously execute complex grasping tasks.

## TECHNICAL SKILLS

**Languages:** Python, C++, C, Kotlin, TypeScript, JavaScript, SQL, C#, MATLAB

**AI, CV & Robotics:** PyTorch, TensorFlow, OpenCV, YOLO, MediaPipe, Face Recognition, LangGraph, OpenAI API, Claude AI

**Web & Backend:** React, Next.js, FastAPI, Node.js, gRPC, tRPC, RESTful APIs, GraphQL, Prisma, Tailwind CSS

**Cloud & DevOps:** AWS, Azure (Services), GCP, Docker, Vercel, Linux/Unix, Git, GitHub

**Databases:** PostgreSQL, MySQL, Supabase

**Spoken Languages:** Spanish (Native), English (B2), French (B1)

## AWARDS & LEADERSHIP

### Sole DigiKey Ambassador

| Only ambassador in LATAM, technical content & outreach | Present

### 1st Place, International LARC Open Robotics

| Top autonomous robotics performance | Nov 2025

### 2nd Place, HackMTY

| Banorte track, 400+ competitors | Oct 2025

### 1st Place, National LARC Open Robotics

| National robotics champion | Apr 2025

### 1st Place, ShellHacks

| Waymo track | Sep 2024