LUIS FERNANDO BENAVIDES

COMPUTER ENGINEER

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Portfolio

I help teams deliver reliable and impactful software by combining full-stack expertise with strong experience in API design, DevOps practices and cloud computing. From building backend services to automating infrastructure and delivering user-facing applications, I bring a broad perspective on creating end-to-end solutions that scale and remain maintainable.

I stand out for quickly learning new technologies, adapting to challenges, and translating complex problems into practical solutions. Motivated by curiosity and initiative, I thrive in collaborative environments where I can apply problem-solving skills and technical expertise to build technology that makes a measurable difference for people and organizations, while continuing to grow as an engineer.

EDUCATION

Instituto Tecnológico de Costa Rica
Computer Engineering
2023 – Expected 2026

LANGUAGES

Spanish
English

SKILLS

- Programming languages including **Python**, **Java**, **C**, **C++**, **JavaScript** and **TypeScript**.
- Web development with **Angular**, **React** and **Flask**.
- Database management using **SQL Server**, **MySQL**, **PostgreSQL**, **MariaDB**, **Elasticsearch** and **MongoDB**.
- Cloud, containerization and orchestration with **Docker**, **Kubernetes**, **Helm**, **AWS** and **Google Cloud**.
- Version control and tools like **Git**, **GitHub** and **Visual Studio Code**.
- Comfortable working in **Linux** environments across multiple distributions.

PROJECTS

Semantify
Developed a semantic search platform for song lyrics with social features, enabling intelligent lyric-based queries and delivering scalable, accurate results.

- Designed a semantic search engine using Hugging Face embeddings and Elasticsearch for vector similarity queries.
- Built a Python/Flask API with caching, observability, and endpoints for vector encoding and user interactions.
- Instrumented the system with logging, metrics, and unit testing while following DevOps best practices.
- Containerized the application with Docker to ensure seamless deployment and scalability.

TuneStay
Built a prototype full-stack platform combining SQL/NoSQL databases and LLM-based embeddings to enable personalized lyric searches and accommodation recommendations with automated deployment on Kubernetes.

- Integrated PostgreSQL and MongoDB to manage song lyrics, metadata, and Airbnb listings.
- Enabled semantic accommodation recommendations through vector embeddings and Elasticsearch.
- Designed a microservices architecture with Docker and Helm Charts for scalable, automated deployment.
- Authored technical documentation for database schemas, API endpoints, and infrastructure setup.

Crossref Search
Implemented a distributed search engine for 1M+ scientific articles, integrating automated ingestion, metadata enrichment, and semantic retrieval with a fully containerized, Kubernetes-orchestrated pipeline.

- Built a scalable data pipeline to process 1M+ articles from AWS S3 using Python CronJobs and Spark SQL.
- Automated metadata enrichment via Crossref API and stored results in Elasticsearch for semantic search.
- Integrated RabbitMQ and MariaDB for job orchestration, queuing, and state tracking.
- Achieved full automation of ingestion, transformation, and infrastructure provisioning.

Battle City
Developed a 2D tank game in Java inspired by the classic NES title, featuring destructible terrain, enemy AI, and power-ups, while applying software design principles for scalable and maintainable architecture.

- Recreated the gameplay with 8+ levels, a custom level editor, and dynamic scoring system.
- Implemented systems for collision detection, terrain destruction, and real-time UI updates.
- Built an extensible enemy spawn system with randomized behaviors to increase replayability.

REFERENCES

Rodrigo Núñez, ITCR
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