

Luis Angel Montiel Moreno

AI & Big Data Principal Consultant Software Engineer

Mobile: +52 2215 68 95 48

Email: luis.angel.montielm@gmail.com

LinkedIn: <https://www.linkedin.com/in/luis-angel-montiel-moreno-053160215>

GitHub: <https://github.com/luis-angel-montiel-moreno>

Google Scholar: https://scholar.google.com/citations?user=BoRH_JsAAAAJ&hl=es

HackerRank: https://www.hackerrank.com/luis_montiel



Professional Summary

1. Expert Identity: I am Luis Angel Montiel Moreno, I have been working for more than 10 years as AI & Big Data Staff-Principal-Tech Lead Consultant Software Engineer working for top global companies who specializes in solving the hardest engineering, data, and architecture problems—those that remain unresolved even after attempts by multiple top seniority engineers, external consultants, and advanced AI tools.

2. Proven Solutions: I have consistently delivered optimal, correct, complete, and production-ready solutions to challenges across the financial, advertising, retail, bio-molecular, health care, real state, business intelligence, mental health and research sectors. Proven record delivering production-ready distributed systems, ETL migrations, AI-powered validation frameworks, data platforms, and optimization algorithms as a Consultant for global companies including Oportun, Zillow, Citi Bank, Apple Ads Platform, CAS, Walmart, NielsenIQ, and HSBC.

3. Technical Approach: My work combines deep computer science foundations, optimization, machine learning, distributed systems, and advanced reasoning, enabling me to detect and repair inconsistencies across data, semantics, architecture, algorithms, processes, and communication links. Recognized for resolving stalled mission-critical initiatives, including processing 500 TB into Databricks with Delta Lake in 1 day, generating 9 billion records, reducing ETL runtimes by more than 90%, and achieving 99.99-100% validation accuracy in regulated financial environments.

4. AI Platforms: I have designed and delivered AI-powered data platforms, large-scale distributed processing systems, intelligent automation frameworks, and explainable ML models used in enterprise environments.

5. Broad Expertise: My expertise spans graph theory, algorithms, AI agentic frameworks, optimization techniques, and large-scale data engineering and ML, always focused on performance, scalability, cost-efficiency, and business impact. Expert in Apache Spark, PySpark, Scala, Java, Python, Databricks, Delta Lake, AWS S3, Hadoop, Hive, Kafka, Airflow, OpenAI API, Gemini API, LangChain, LangGraph, graph theory, operations research, and algorithmic complexity reduction.

6. Digital Transformation: Beyond engineering, I have played a key role in digital transformation, architecture modernization, cloud strategies, and enterprise decision-making frameworks. I have designed full-stack, application, and data architectures for banking and healthcare organizations, and I have developed architecture governance systems, automation frameworks, and AI-driven consistency tools used to ensure correctness and alignment across domains.

7. Scientific Background: I bring a research-driven mindset, with academic contributions including publications in international conferences such as ECAI, and a competitive programming background such as participation in the ACM ICPC World Finals.

8. Professional Philosophy: My professional philosophy integrates 9th principles—Balanced Compassionate Responsibility, Common Good, Decision Making, Priorities, Order & Dialogue, Convergence, Guarantee of Correctness & Completeness, Complementarity, and Hard Work—ensuring that solutions are not only technically excellent but also human-centered and strategically aligned.

9. Passionate Impact: Above all, I am passionate about applying rigorous computer science to solve real-world problems at enterprise scale, enabling organizations to innovate, reduce costs, increase performance, achieve customer satisfaction and enhance human development and well-being.

Core Competencies / Skills

- **Programming Languages:** Java, Scala, Python, C++, SQL, Gradle, Groovy, Shell Script, Unix, JavaScript, TypeScript, HTML5, CSS3, PHP.
- **Big Data & Distributed Computing:** Apache Spark, PySpark, Spark Streaming, Delta Lake, Databricks, Azure Databricks, Hadoop, Hive, Impala, Hudi, Cloudera, GCP Dataproc, AWS Athena, AWS EMR, AWS S3, Azure Cold Storage.
- **Data Engineering & Streaming:** ETL, ELT, batch processing, stream processing, data lake pipelines, data warehousing, schema evolution, Avro, Parquet, Kafka, Confluent, Schema Registry, Flink, Oozie, Airflow, Autoloader.
- **Databases & Storage:** MySQL, Oracle, DB2, PostgreSQL, MongoDB, Cassandra, Azure Cosmos DB, NoSQL, JDBC, JPA, Hibernate.
- **AI, ML & Agentic Engineering:** Machine Learning, scoring models, SHAP values, XGBoost, NLP, LLMs, AI agents, OpenAI API, Gemini API, Claude API, Glean API, Windsurf API, Codex, Copilot, LangChain, LangGraph, Llama3, knowledge graphs, logic programming.
- **Architecture & Software Engineering:** Software Architecture, Clean Architecture, SOLID, Clean Code, Design Patterns, Object-Oriented Programming, REST APIs, RESTful services, Spring Boot, microservices, data/application architecture, architecture governance, decision trees, semantic property graphs.
- **Optimization & Research Methods:** Algorithms, algorithmic complexity, graph theory, dynamic programming, mathematical programming, operations research, integer programming, CPLEX, Mosel, FICO Xpress, CLASP, CLINGO, Answer Set Programming, DLV.
- **DevOps & Quality Engineering:** Git, GitHub, GitLab, Bitbucket, Git Flow, Jenkins, Docker, Kubernetes, CI/CD, JUnit, Chispa, mocks, unit testing, integration testing, regression testing, stress testing, performance testing, benchmarking, QA automation.
- **Leadership & Delivery:** Technical leadership, principal consulting, stakeholder alignment, cross-functional collaboration, mentoring, training, agile delivery, SCRUM, Kanban, pair programming, business impact analysis, regulatory validation, data governance, security.

Professional Experience

Big Data Staff Software Engineer

Oportun | February 2026 – March 2026

Project: Migration of Domo ETL Dataset / Mappings / Metrics / Dashboards to Semantic Layer |

Remote, USA | Teams: USA, India, China, Mexico

- **Positive Impact:** Resolution to computation of the inventory of mappings and metrics over Domo ETL SQL Lineage, an $O(2^n)$ complexity problem due to tree structure over output columns and $O(n^2)$ at each node, i.e. $O(2^n * n^2)$.
- **AI/ML Relevance:** Advanced algorithmic design, automation frameworks, decision complexity optimization, semantic property graph, and high-volume AI hallucination resolution.
- **Lineage Algorithm Breakthrough:** Designed a SQL lineage resolution algorithm for Domo Platform Dataset Views, solving inventory computation over Domo ETL SQL lineage with $O(2^n * n^2)$ complexity caused by tree-structured output columns and node-level comparisons.
- **Enterprise Data Engineering Stack:** Composed ETL SQL lineage processing with Python, PySpark, Apache Spark, Databricks, GraphFrames, Apache Delta Lake, Apache Hive, AWS S3, SQL, Airflow, Docker, Git, GitHub, JIRA, and Confluence.
- **Semantic Graph Automation:** Built a semantic property graph and pyvis visualization workflow to automate lineage extraction, documentation, and validation across complex

Domo SQL transformations, ETL Magic flows, dataset views, metrics, mappings, and dashboards.

- **Complexity Reduction Success:** Reduced exponential decision-tree complexity through algorithmic design, automation, graph modeling, and AI-assisted analysis using OpenAI API, Gemini API, Claude API, and Codex while resolving high volumes of AI hallucinations.
- **Financial Optimization Value:** Proposed a mixed-integer programming extension for concentration satisfaction over financial investment standards, applying mathematical programming and operations research to portfolio compliance decisions.
- **Reporting Accuracy Improvement:** Implemented automation to validate generated financial reports and replace unreliable manual or Excel-based processes with data models, repeatable checks, and evidence-driven financial reporting.
- **Scalable Delivery Discipline:** Applied SCRUM, Clean Architecture, Clean Code, optimization, automation, TDD, design patterns, proofs of concept, batch processing, stream processing, and algorithmic complexity analysis to deliver accurate, complete, and scalable fintech data solutions.

Big Data Principal Consultant Software Engineer

Zillow | April 2025 - August 2025

Project: Large-Scale Backfill and Optimization of Big Data Pipelines for Core Analytics Data Warehouse | Remote, USA | Teams: USA, India, China

- **Positive Impact:** Delivered a breakthrough AI-driven solution that saved Zillow months of delay, reduced cloud costs, and reinforced its competitive edge in massive-scale real estate data by combining generative AI integration, algorithmic complexity optimization, and automation frameworks.
- **AI/ML Relevance:** Advanced algorithmic design, automation frameworks, and decision complexity optimization.
- **Massive-Scale Backfill Delivery:** Led a mission-critical large-scale data backfill for Zillow's core analytics data warehouse, processing 500 TB of Avro files into Databricks with Delta Lake in 1 day and generating 9 billion records.
- **Stalled Program Recovery:** Resolved a decision-tree and schema-evolution problem that remained unsolved for 8 months despite attempts by 5+ lead engineers and advanced generative AI systems including Cursor, Gemini, WindSurf, ChatGPT, Glean, and Claude.
- **NEXPTIME Complexity Optimization:** Reduced an unfeasible NEXPTIME-class processing path from more than 1 month to 1 day by designing custom architecture, optimization algorithms, schema compatibility logic, and batch generation strategies for AWS resource allocation.
- **AI Data Quality Innovation:** Built an AI-powered consistency checker for Zillow listings using OpenAI API to parse natural language, extract structured property features, and detect mismatches against canonical real estate fields.
- **Schema Reliability Protection:** Repaired Avro header inconsistencies in AWS S3 buckets, mitigated cascading LLM hallucinations, managed schema registry complexity, and prevented degraded performance across ZillowGroup data platforms.
- **Architecture Risk Mitigation:** Evaluated architecture risks, integration issues, metadata standards, data governance requirements, and compliance needs while collaborating with business owners, tech leads, and cross-domain architects.
- **Business Continuity Execution:** Used PySpark, Databricks, Python, AWS S3, Apache Spark, Delta Lake, Apache Hive, Docker, Airflow, SQL, GitLab, OpenAI API, Gemini API, Claude API, Glean API, WindSurf API, LangChain, LangGraph, and Llama3 to deliver business continuity, cloud cost savings, and scalable data warehouse execution.

Big Data Principal Consultant Software Engineer

WorldLink - Citi Bank US | April 2024 - January 2025

Project: Migration & Optimization of ETL Derivations, Validation Automation, Performance Tuning, Scoring, and SHAP Values | Remote, Texas, USA | Teams: USA, India, China, Mexico

- **Positive Impact:** Reduced ETL processing times by over 90%, ensured 99.99-100% validation accuracy to resolve a Consent Order, mentored engineers and tech leads, and contributed to 900 derivations and financial reports for 7 different customers.
- **AI/ML Relevance:** Explainable AI with SHAP, intelligent validation automation, and optimization for ML-based scoring.
- **Regulatory Remediation Impact:** Led critical ETL migration and optimization initiatives for Citi Bank, reducing ETL processing times by more than 90% and ensuring 99.99-100% validation accuracy to support resolution of a Consent Order.
- **Financial Reporting Governance:** Governed and supported 900+ ETL derivations and financial reports for 7 customers, mentoring engineers and tech leads while improving regulatory accuracy, completeness, consistency, and delivery speed.
- **Legacy Migration Success:** Migrated complex Ab Initio logic to PySpark and personally translated thousands of lines of imperative ETL code, including 5,000 lines for Arrangement Rating Contract logic and interview-supported migration of 3,000 lines using custom translation rules and Copilot.
- **Reusable Logic Framework:** Created a Logic Library for if/else logic and extended PySpark-oriented orchestration patterns to handle complex conditional business rules, object-oriented programming, persistence management, and reusable data-processing abstractions.
- **Validation Automation Quality:** Implemented plug-and-play YAML-configured validators with detailed counterexamples, statistics, automated justification documents, and pre-QA debugging workflows for risk, IR, and quality teams.
- **Runtime Performance Gain:** Optimized derivations for Balance Segment, Involved Party, CO CHD Ext, and other contracts under Apache Spark and Citi frameworks, reducing flows from 6-2 hours to less than 30 minutes in many cases.
- **Explainable Scoring Leadership:** Developed support libraries for time measurement, date processing, lookup dictionaries, persistence queues, automated resource optimization, and SHAP value computation in Apache Spark, presenting explainable scoring results to senior leadership.

Big Data Principal Consultant Software Engineer

Bonzzu - Apple / Ads Platform | October 2023 - February 2024

Project: Entity Resolution Optimization, Presto vs Hive Optimization, OWASP Security Automation, Ads Platform Testing Automation | Remote, NY, USA | Teams: USA, India, China, Mexico

- **Positive Impact:** Helped Apple improve security compliance, processing efficiency, and testing automation, reducing risks and accelerating development cycles.
- **AI/ML Relevance:** Entity resolution as an applied ML concept, intelligent automation in testing, and security automation.
- **Entity Resolution Optimization:** Optimized entity resolution algorithms for industrial parity jobs using Scala, Java, Python, Apache Spark, Hadoop, Kafka, AWS S3, Parquet, SQL, and distributed data warehousing practices.
- **Query Engine Efficiency:** Improved Presto vs Hive usage for SparkSQL jobs, increasing processing efficiency and strengthening architectural decisions for Apple Ads Platform data workloads.
- **Security Risk Reduction:** Automated OWASP dependency vulnerability resolution with Java, Python, and Shell scripts, reducing security risk and accelerating compliance remediation.

- **Testing Automation Acceleration:** Built automated REST testing and end-to-end testing support for Ads Platform components using Spring Boot, REST microservices, PostgreSQL, Docker, Gradle, Groovy, Jenkins, GitHub, CI/CD, and technical documentation.
- **Secure Architecture Delivery:** Defined integration architecture, security standards, and optimization practices using SCRUM, Clean Architecture, Clean Code, refactoring, algorithmic complexity analysis, TDD, design patterns, and proof-of-concept delivery.

Big Data Principal Consultant Software Engineer

Workstate - Chemical American Society (CAS) | February 2023 - July 2023

Project: Cloudera ETL Optimization, Hub-Spoke ETL Pipelines, XSLT Refactor & Graph Visualizer | Remote, Ohio, USA | Teams: USA, India, China, Mexico

- **Positive Impact:** Improved system reliability, enabled scientific accuracy, and exponentially boosted team productivity.
- **AI/ML Relevance:** Graph theory applications, AI-driven debugging, and knowledge representation.
- **Scientific Data Reliability:** Optimized batch ETL processes in Cloudera using Spark best practices, improving reliability, scientific data accuracy, performance, and team productivity.
- **Hub-Spoke Pipeline Delivery:** Implemented batch and streaming ETL pipelines under a hub-spoke architecture with Scala, Java, Python, Apache Spark, Hadoop, Hive, Kafka, AWS S3, XML, JSON, XSLT, Parquet, SQL, Docker, Spring Boot, REST microservices, and PostgreSQL.
- **Dependency Visibility Improvement:** Designed and implemented graph-based software to visualize XSLT program file dependencies, mapping application/data relationships and accelerating debugging for complex scientific repositories.
- **Framework Issue Resolution:** Resolved hard issues in customer frameworks using AI, logic, optimization principles, binary debugging, unit testing, integration testing, regression testing, and performance testing.
- **Entity Linking Resolution Optimization:** Optimized entity linking resolution algorithms for industrial parity jobs over internal developed framework using Scala, Java, Python, Apache Spark, Hadoop, Kafka, AWS S3, Parquet, SQL, and distributed data warehousing practices.
- **Healthcare Standards Contribution:** Processed data under HL7 standards with semantic web queries using XQuery and contributed to microservices under FHIR R4 and SMART for medical, health, and bio-molecular repositories.
- **Engineering Team Enablement:** Mentored software engineers and improved learning curves through clear architecture documentation, dependency models, best practices, and cross-domain communication.

Big Data Senior Software Engineer

EPAM Anywhere - Walmart | June 2022 - December 2022

Project: ETL SaaS Retry Policy, Spark Optimization, Hudi Metrics Integration, Cassandra Streaming Pipelines | Remote, New York, USA | Teams: USA, Russia

- **Positive Impact:** Reduced pipeline failures, enhanced real-time analytics, and saved Walmart significant cloud costs.
- **AI/ML Relevance:** Real-time streaming for ML features, monitoring ML pipelines, and resilient architectures.
- **Pipeline Resilience Improvement:** Implemented retry policies for ETL SaaS pipelines in Spark and Azure, reducing pipeline failures and improving reliability for large-scale retail data workflows.
- **Cloud Cost Optimization:** Engineered optimized Spark pipelines in Databricks using datasets, SQL tuning, batch processing, and data lake techniques to reduce cloud costs and enhance analytics performance.

- **Observability Enhancement:** Integrated Apache Hudi metrics monitoring with Prometheus and Pushgateway, improving observability for data platform operations.
- **Streaming Ingestion Delivery:** Developed Cassandra ingestion pipelines with Spark Streaming to Azure Cold Storage and built heterogeneous batch and streaming ETL processes across multiple data sources.
- **Platform Modernization:** Led migration of Walmart APIs from Spark 2.1 to 3.1 and Cassandra 3 to 4.11, refactoring and deploying services to Databricks and GCP Dataproc.
- **Retail Data Engineering Stack:** Used Scala, Java, Python, Apache Spark, Hadoop, Hive, Cassandra, Airflow, Kafka, Databricks, Azure Databricks, Azure Cosmos DB, Jenkins, Git, Kubernetes, AWS S3, SCRUM, Kanban, Clean Architecture, TDD, and design patterns.

Tech Lead Software Engineer

Tata Consultancy Services - NielsenIQ | August 2021 - May 2022

Project: BI Data Warehouse Cubes, Batch Optimization, LATAM Cluster Migration | Remote, Mexico City / Canada | Teams: Mexico, India, Canada

- **Positive Impact:** Saved NielsenIQ millions by cutting cloud costs and boosted system performance and scalability.
- **AI/ML Relevance:** Data foundation for ML and scalable feature engineering pipelines.
- **Cluster Migration Leadership:** Led migration of LATAM Spark-Hadoop-Hive-Impala workloads from Cloudera to independent clusters, defining transition architectures, capability gaps, and validation plans.
- **Runtime Reduction Achievement:** Optimized Spark batch jobs from 8 hours to less than 4 minutes, saving NielsenIQ millions in cloud costs while increasing scalability and performance.
- **BI Platform Delivery:** Developed full-stack features for BI data cubes using Java, Scala, Python, Angular, Spring Boot, C#, .NET, IIS, XML, JSON, Avro, XSLT, SQL, and Docker.
- **Migration Quality Assurance:** Validated migrations through unit, integration, and regression tests, strengthening data warehouse quality and reducing production risk.
- **Legacy Query Modernization:** Refactored legacy Impala queries and components for new clusters using Apache Spark, Hadoop, Hive, Impala, Kafka, Airflow, Azure Databricks, Jenkins, Git, AWS S3, Oozie, and Sqoop.

Consultant - AI & Optimization Engineer

Freelance - PhD Mauricio Osorio Galindo | January 2018 - May 2021

Project: Digital Companion Chatbot and Creative Dialogue Problem | Remote, Puebla, Mexico | Collaboration with researchers from Sweden, Germany, Italy, France, and England

- **Positive Impact:** Advanced AI ethics and reasoning research, influencing academic and applied AI in ECAI 2020, one of the most important European scientific research congresses in AI.
- **AI/ML Relevance:** Conversational AI, NLP reasoning, and ethical AI.
- **Conversational AI Research:** Designed and implemented the Digital Companion AI chatbot using logic programming, knowledge graphs, and AI reasoning for emotional well-being and mental health use cases.
- **Optimization Problem Solving:** Defined and solved the Creative Dialogue Composition Problem using dynamic programming, graph theory, mathematical logic, and knowledge representation.
- **Scientific Publication Impact:** Authored and presented 2 scientific papers at ECAI-related venues on Deceptive AI, Knowledge Graph Representation, and logical-based AI construction.

- **Mental Health AI Prototype:** Developed an Efriend proof-of-concept chatbot for emotional well-being using Scala, Java, Python, Apache Spark, Hadoop, Heroku, Oozie, Angular, Clingo, Clasp, DLV, Mosel, Spring Boot, PostgreSQL, REST, XML, JSON, and Avro.

AI & Software Engineer - Independent Researcher

Freelance - Code Generator Project | January 2018 - May 2021

Project: Automatic Code Generator from Database Schema to MVC Monoliths and Microservices | Remote, Puebla, Mexico

- **Positive Impact:** Enabled exponential acceleration in software delivery by reducing development cycles from weeks to hours.
- **AI/ML Relevance:** Early application of AI in code generation and automation.
- **Software Delivery Acceleration:** Designed and implemented an automatic code generator that produced full monolithic and microservice systems from database schemas, reducing development cycles from weeks to hours.
- **Full-Stack Code Generation:** Generated CRUD entities, DAOs, services, controllers, and GUIs dynamically using Java, Servlets, JSP, Struts2, JDBC, JPA Hibernate, Spring Boot, Angular, SQL, HTML5, CSS3, PHP, REST, and PostgreSQL.
- **Reusable Automation Proof:** Published a free proof of concept online and applied Clean Architecture, TDD, automation, concurrent programming, and proof-of-concept delivery to accelerate software generation.

Senior Software Engineer

Profeti Consultores - SEP Puebla | November 2014 - February 2015

Project: State Schools Pre-Registration System | Puebla, Mexico

- **Positive Impact:** Delivered a scalable public service platform that improved education access, efficiency, and geolocation-based school suggestions.
- **AI/ML Relevance:** Location-based recommendation logic.
- **Public Service Platform Delivery:** Led development of a scalable public service platform for Puebla's education department, improving education access, efficiency, and geolocation-based school suggestions.
- **Education Access Scale:** Built recommendation logic to suggest nearest schools through geolocation and support 10,000 schools and 1M students.
- **Production Implementation:** Delivered Java, Struts2, MySQL, multithreading, Google Maps API, JavaScript, JQuery, and GlassFish functionality with SCRUM, Clean Architecture, QA, testing, and data migration.

Consultant - AI & Optimization Engineer

PSII Psychologies Infantil | July 2013 - October 2014

Project: Patient Management, Appointments & Reporting System | Remote, Puebla, Mexico

- **Positive Impact:** Improved clinic operations, patient tracking, and reporting, increasing efficiency and service quality.
- **AI/ML Relevance:** Data mining, unsupervised learning with clustering, healthcare analytics, and data-driven decision systems.
- **Clinic Operations Digitization:** Designed and developed an information system for a children's psychology clinic, including appointment management, payments, progress tracking, and PDF reporting.
- **Healthcare Data Warehouse:** Built a data warehouse integrating patient history, therapy sessions, and progress metrics to improve clinic operations, patient tracking, reporting, and service quality.

- **Patient Segmentation Analytics:** Implemented K-means clustering to segment patients by psychological feature levels, treatment response, and progress patterns for healthcare analytics and decision support.
- **Decision Dashboard Delivery:** Developed dashboards with PHP, MySQL, HTML, JQuery, and Google Charts API, and deployed the solution to production with QA validation.
- **Medical Records Integration:** Implemented and extended business logic for microservices managing Electronic Medical Records (EMR) and Electronic Health Records (EHR).

Adjunct Professor

Universidad del Valle de Puebla | February 2012 - August 2014

Project: IT Professor and Bachelor Thesis Advisor | Puebla, Mexico

- **Positive Impact:** Fostered innovation in educational AI and automation projects with real-world social impact.
- **AI/ML Relevance:** IoT data automation, applied AI in education, intelligent decision systems, real-time data ingestion and warehousing, decision support for agriculture, and applied data-driven control systems.
- **Computer Science Education:** Taught Advanced Programming, Databases, Machine Learning, and Operating Systems to Computer Systems Engineering students.
- **Applied AI Thesis Leadership:** Supervised AI, automation, and IoT thesis projects, including natural-language systems for deaf students, augmented-reality tools for elementary mathematics, and agriculture decision systems using real-time weather and satellite APIs.
- **Award-Winning IoT Innovation:** Designed and supervised an automated land irrigation system using Arduino, weather sensors, and data warehousing that won 1st place in a Microsoft-judged technology contest.
- **Research-Based Technical Mentoring:** Applied Java, XML, Swing, MySQL, Tomcat, JDBC, Arduino, WUnderground API, data warehousing, Clean Architecture, TDD, graph theory, knowledge representation, mathematical logic, and operations research.

Adjunct Professor

Universidad Hispana Puebla | August 2013 - June 2014

Project: IT Professor | Puebla, Mexico

- **Positive Impact:** Empowered students to design socially oriented intelligent systems integrating AI and automation concepts.
- **AI/ML Relevance:** Predictive modeling in education, intelligent system design, and applied AI teaching methodologies.
- **Technical Education Delivery:** Lectured in Software Engineering, Physics, and Mechatronics while coordinating student projects applying computational logic to socially oriented intelligent systems.
- **Social Impact Systems Leadership:** Led development of systems for hospital management, vocational guidance prediction, and community service automation.
- **Applied Engineering Methods:** Used Java, XML, Swing, MySQL, Tomcat, JDBC, Arduino, data warehousing techniques, Clean Architecture, TDD, graph theory, knowledge representation, mathematical logic, and operations research.

Tech Lead Consultant

Consultant - HSBC | April 2008 - December 2008

Project: HSBC Security Standards Compliance for 8 Value Transportation Systems | Toluca, Estado de Mexico, Mexico

- **Positive Impact:** Strengthened the reliability and compliance of core financial software through automation.

- **AI/ML Relevance:** Data security automation, anomaly detection preparation, and banking compliance logic.
- **Banking Security Compliance:** Applied HSBC Security Standards, including RSA authentication, across 8 financial computing systems for the Finance Department.
- **Secure Module Engineering:** Designed secure modules in Java, Servlets, JSP, JavaScript, IBM DB2, WebSphere, and Shell scripting to strengthen reliability and compliance.
- **Transactional Integrity Automation:** Implemented automated data validation and integration scripts to improve transactional integrity in banking software.

Tech Lead Software Engineer

Social Service - Universidad de las Americas Puebla | January 2003 - December 2004

Project: Vehicular Control and Student Incident Management System | Puebla, Mexico

- **Positive Impact:** Enhanced campus security through automation and event tracking.
- **Campus Security Leadership:** Led a team of 4 to design and implement a Vehicular Control and Student Incident Management System for campus security automation.
- **Operational Automation Scale:** Automated entry permissions, parking access, and student incident logging, supporting production deployment for 9,000 students per year.
- **Production QA Ownership:** Managed data migration and QA using Java, Servlets, JSP, Oracle, Tomcat, Solaris Unix, Clean Architecture, TDD, and proof-of-concept practices.
- **Software Architecture:** Managing and involved in the analysis, design, development, implementation, testing, QA, production delivery, data migration, system integration, user training of the System.

AI Independent Researcher

Independent Researcher - Family Science & Human Development | January 2016 - September 2021

Project: AI Ethics and Human Development | Puebla, Mexico | Collaboration with researchers from EU and Mexico

- **Positive Impact:** Published innovative theoretical frameworks redefining AI ethics and human-centered intelligence.
- **AI/ML Relevance:** Computational ethics, logic-based reasoning, graph-theoretic human modeling, and explainable AI.
- **Human-Centered AI Modeling:** Applied graph theory, mathematical induction, and logic to model human dignity, compassion, decision-making ethics, and explainable AI.
- **Ethical AI Framework Creation:** Defined an AI ethics framework grounded in human well-being, proposing a logic-based definition of intelligence as compassion.
- **Therapeutic Agent Design:** Integrated psychological therapies including CBT and mindfulness into AI logical agents for emotional reasoning and self-regulation.
- **Social Rehabilitation Prototyping:** Designed prototype AI systems for social rehabilitation by mapping family dynamics to agent-based behavior and computational ethics.

Education

PhD (Certificate) in Computer Science specialized in Artificial Intelligence and Optimization
Universidad de las Americas Puebla | 2009 - 2012

Certificate (Master) in Computational Logic specialized in Artificial Intelligence
Free University of Bozen & TU Wien | 2005 - 2007

Master's Degree in Sciences specialized in Computer Systems Engineering Artificial Intelligence
Universidad de las Americas Puebla | 2005 - 2006

Bachelor's Degree in Computer Systems Engineering specialized in Artificial Intelligence
Universidad de las Americas Puebla | 1999 - 2004

Diploma in Marriage, Family Science & Human Development
Instituto Social Femenino Puebla | 2013 - 2015

Certifications & Awards

- 3rd Place Winners World Final Programming Contest ACM ICPC 2004 Java Challenge.
- Honorable Mention, 2003 World Final Programming Contest ACM ICPC.
- Honorable Mention, 2004 World Final Programming Contest ACM ICPC.
- Certification course on Databricks with Scala and Python by Databricks.
- Certification course Big Data Engineer for Google Cloud Products by Google.
- EPAM-EngX course on Quality Assurance of Software Development by EPAM Anywhere.
- Security courses by Tata Consultancy Services and EPAM Anywhere.

Publications in Artificial Intelligence

- 2021, Creative Composition Problem: A Knowledge Graph Logical Based AI Construction and Optimization Solution. Lecture Notes in Computer Science book series, LNCS volume 12640, Springer.
- 2020, E-friend: A logical-based AI agent system chat-bot for emotional well-being and mental health. DeceptECAI 2020, DeceptAI 2021, Communications in Computer and Information Science, volume 1296, Springer, Cham.
- 2010, Assistance in making decisions to promote planting and conservation of maize in the state of Puebla of Mexico through Answer Set Programming. Proceedings of the Sixth Latin American Workshop on Non-Monotonic Reasoning 2010.
- 2004, Computing Preferred Safe Beliefs. Proceedings of the 1st International LA-NMR04 Workshop.

Selected Technical Projects

AI-Powered Zillow Listing Consistency Checker

- Built an AI system using OpenAI API to parse natural-language real estate descriptions, extract structured listing features, and detect inconsistencies against canonical Zillow fields.
- Improved metadata quality, reduced schema inconsistency risk, and strengthened business reporting for large-scale real estate analytics.

Citi Bank ETL Validation and Logic Framework

- Designed YAML-configured validators, custom logic libraries, PySpark extensions, automated justification documents, and reusable debugging tools for 900+ derivations and regulated financial reports.
- Achieved 99.99-100% validation accuracy, accelerated compliance workflows, and reduced processing times by more than 90%.

Domo SQL Lineage Semantic Property Graph

- Created a PySpark and GraphFrames-based lineage extraction framework to model Domo SQL transformations, dataset mappings, metrics, and dashboard dependencies as a semantic property graph.
- Automated documentation and visualization for complex financial ETL pipelines with non-canonical dataset and column representations.

CAS XSLT Dependency Graph Visualizer

- Built graph software to visualize XSLT program dependencies and data flow relationships in scientific, health, and bio-molecular repositories.
- Improved framework debugging, dependency analysis, architecture documentation, and team productivity.

Digital Companion Chatbot / Efriend

- Developed logic-based AI chatbot prototypes for emotional well-being and mental health using knowledge graphs, computational logic, graph theory, and proof-of-concept engineering.
- Published ECAI-related research on deceptive AI, knowledge graph representation, creative dialogue, and logical AI agents.

Volunteering

Down Syndrome Foundation | Pedagogue Assistant | Aug 1996 - Jun 1997

- Developing skills in kinder garden children with Down Syndrome

Decroly Puebla | Pedagogue Assistant | Aug 1997 - Jun 1998

- Developing skills in mentally handicapped youths and old people.

INEA | Teacher of Mathematics for Adult People | Sep 1999 - Jul 2000

- Teaching Mathematics to Adult People with no education in primary and secondary school as military service.

Universidad de las Américas Puebla | Scholarship Holder working in Social Service Department to provide Education to Adult people | Sep 1999 - Jul 2003

- Education of Adult people without primary and secondary school.

Universidad de las Américas Puebla | Member of the directive student board of Computer Systems Engineer Department | Aug 2002 - Jul 2003

- Organizing Congress of Science of Technology for Computer Systems Engineering Department. Managing Student Chapter of ACM Managing Student Chapter of Upsilon Pi Epsilon.
- Organizing talks in artificial Intelligence.

Universidad de las Américas Puebla | Assessor in Sciences | Sep 1999 - Jul 2004

- Helping during 4 yrs 11 mos in Science and Technology more than 8 students per semester that were in risk to fail in science bachelor lectures. Success was reached to avoid school dropout.