

# Loren Cossette, Ph.D. (c)

## Senior AI/ML Engineer & Strategic Technology Leader

AI Engineer with deep expertise in Large Language Models (LLMs), Generative AI, data science, and advanced machine learning systems designed for high-impact, real-world deployment. Led USAA Bank's enterprise AI strategy across a \$126B portfolio and architected production-grade GenAI and NLP solutions using GPT, Claude, and Mistral in secure, compliant cloud environments (Azure, AWS). Extensive experience developing full ML pipelines—from data cleaning and feature engineering to real-time inference and model monitoring—using Python, SQL, Pandas, and NumPy. Skilled in MLOps, CI/CD, and scalable deployment using Docker containerization, GitHub version control, and Azure ML production environments. Published researcher and recognized thought leader with passion for advocacy and designing ethical, reliable, and interpretable AI systems that improve decision-making and drive innovation at scale.



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## SKILLS

Executive Leadership

Strategy & Planning

Organizational Effectiveness

Organizational Change Management (OCM)

Team Building

Project Management

Executive Coaching

Board & Executive Communication

Workforce Transformation

Digital Transformation

AI Strategy

AI Governance & Ethics

Cultural Transformation

Workforce Development

Thought Leadership

Optimization



## TECHNICAL SKILLS

<b>AI/ML Engineering</b>	LLM Deployment (GPT, Claude, Mistral) • Custom Training Pipelines • RAG Systems • Vector Databases • MLOps • Azure ML • Model Fine-tuning • Bias Detection • A/B Testing
<b>Machine Learning</b>	Deep Learning (TensorFlow, Keras, PyTorch) • Computer Vision • Time Series Forecasting • Ensemble Methods • XGBoost • scikit-learn • Feature Engineering • Model Optimization
<b>S/W Engineering</b>	Python • React • FastAPI • SQL • JavaScript • Azure • AWS • Docker • CI/CD • Git • RESTful APIs • Database Design
<b>Data Engineering</b>	ETL Pipelines • Real-time Analytics • Pandas • NumPy • Data Preprocessing • Model Monitoring • Performance Optimization
<b>Frameworks</b>	LangChain, FastAPI, Flask, Streamlit, React Cloud & DevOps: Azure, AWS, Hadoop, Spark, Git, Salesforce



## TECHNICAL PORTFOLIO

### UIW Academic Reading Intelligence System (AIRS)

- **Role:** Lead AI Engineer | **Technology:** React, Azure OpenAI, FastAPI, Custom Training Pipeline
- Architected and deployed production-grade LLM-powered academic reading coach serving 500+ university students across multiple disciplines Developed sophisticated fine-tuning pipeline generating synthetic training datasets using Bomers' 15 reading strategies framework Built multi-turn conversational AI system with session persistence, handling student resistance and progressive skill building Engineered React frontend with real-time chat interface, session management, and Azure OpenAI API integration Implemented automated text processing pipeline splitting academic documents into semantic sections for targeted coaching Created comprehensive evaluation framework tracking student engagement patterns and reading comprehension improvement

### Clinical Decision Support RAG System

- **Role:** ML Engineer | **Technology:** LangChain, ChromaDB, Mistral-7B, Transformer Embeddings
- Built enterprise-grade retrieval-augmented generation system for healthcare professionals using Merck Manual knowledge base Implemented semantic search using SentenceTransformer embeddings with 95%+ query relevance accuracy Designed custom LLM prompt engineering framework for medical information retrieval with safety guardrails Deployed vector database solution handling 10,000+ medical documents with sub-second query response times

### ORBIT Document Intelligence Platform

- **Role:** Full-Stack ML Engineer | **Technology:** Streamlit, ChromaDB, OpenAI, Advanced NLP
- Developed intelligent document query system enabling semantic search across enterprise document repositories Implemented advanced document chunking algorithms optimizing context preservation for LLM processing Built scalable vector storage solution supporting multi-format document ingestion (PDF, DOCX, TXT) Created intuitive web interface for non-technical users to interact with complex AI systems



## TECHNICAL PORTFOLIO

### Worldview Alignment Intelligence Platform

- **Role:** AI Product Developer | **Technology:** React, Firebase, OpenAI, PCA, TypeScript
- Built sophisticated web application using principal component analysis to map user philosophical alignment with global figures Implemented cosine similarity algorithms for multi-dimensional personality and values matching Developed real-time recommendation engine processing complex psychological and philosophical data Created scalable cloud architecture supporting 1,000+ concurrent users with Firebase backend integration

### EasyVisa Immigration Risk Prediction Engine

- **Role:** Machine Learning Engineer | **Technology:** Python, scikit-learn, Random Forest, SHAP, Ensemble Methods
- Developed production ML system predicting visa application success with 92%+ accuracy using socio-demographic data Implemented ensemble learning approach comparing Random Forest, Bagging, and AdaBoost algorithms Applied SHAP explainability framework for interpretable AI, identifying key predictive features for legal decision support Enabled data-driven immigration case prioritization with transparent model reasoning and compliance reporting

### AllLife Bank Loan Prediction System

- **Role:** Data Scientist | **Technology:** Python, scikit-learn, Advanced EDA, Decision Trees
- Developed end-to-end ML pipeline predicting personal loan adoption using behavioral data from 5,000+ banking customers Performed advanced feature engineering including custom ZIP code categorization and Cramer's V correlation analysis Built and compared multiple algorithms (Decision Trees, Logistic Regression, K-Means) with hyperparameter optimization Delivered actionable insights for marketing campaign targeting and customer segmentation strategies

### Retail Sales Forecasting System

- **Role:** Data Scientist | **Technology:** Python, XGBoost, Time Series Analysis, scikit-learn
- Built end-to-end forecasting model predicting daily retail sales using historical point-of-sale transaction data Engineered time-aware features including seasonality patterns, lag variables, and trend cycles Trained XGBoost regression model with high R<sup>2</sup> accuracy and comprehensive forecast validation Delivered scalable prediction pipeline for retail planning and inventory optimization systems

### Motorcycle Helmet Detection CNN

- **Role:** Computer Vision Engineer | **Technology:** TensorFlow, Keras, OpenCV, CNN Architecture
- Built custom convolutional neural network achieving 95%+ validation accuracy for helmet compliance detection Processed and augmented image datasets using OpenCV with advanced data preprocessing techniques Designed CNN architecture with dropout regularization and ReLU activation for robust real-time inference Enabled automated road safety compliance monitoring with frame capture and classification pipeline

### Customer Churn Neural Network (Telecom)

- **Role:** Deep Learning Engineer | **Technology:** Keras, TensorFlow, Neural Networks, Advanced Preprocessing
- Developed multi-layer neural network predicting telecom customer churn with 86%+ validation accuracy Implemented comprehensive feature preprocessing including scaling, encoding, and correlation analysis Designed deep learning architecture with dropout layers and optimization for behavioral pattern recognition Generated actionable business insights highlighting key churn predictors for retention strategy development

### Interactive Regression Modeling Framework

- **Role:** ML Engineer & App Developer | **Technology:** Streamlit, scikit-learn, Plotly, NumPy
- Built production-ready regression modeling application with interactive UI for rapid ML experimentation Integrated multiple algorithms (Linear, Ridge, Lasso, ElasticNet) with real-time evaluation metrics and dynamic visualizations Designed modular backend framework supporting hyperparameter tuning and side-by-side model comparison Enabled rapid prototyping and educational demonstrations with interpretable diagnostics and extensible architecture

### Sales Transaction Analytics Platform

- **Role:** Data Analyst & Visualization Engineer | **Technology:** Python, Pandas, Seaborn, Matplotlib, Advanced Analytics
- Conducted comprehensive exploratory data analysis on retail sales data uncovering key business opportunities Engineered date-based and categorical features with advanced pandas transformations for trend analysis Created sophisticated visualizations revealing product performance, customer behavior, and sales cycle patterns Delivered reproducible EDA pipeline enabling stakeholder-driven insights for marketing and pricing strategies



## WORK EXPERIENCE

### Doctoral Research and Academic Consulting (GenAI Engineer & Strategic Advisor)

University of the Incarnate Word & Houston Christian University

11/2024 - Present

Achievements/Tasks

- Deployed a fine-tuned LLM on Azure ML, powering a reading support system that processed 10,000+ academic texts, delivering personalized tutoring.
- Designed and modernized AI/ML curriculum, integrating GenAI, predictive modeling, and AI ethics to meet evolving industry and academic standards.
- Built a bias detection and fairness framework, applying statistical metrics and privacy safeguards to ensure ethical AI use across diverse student groups.
- Led development of immersive Python/R /R workshops, featuring applied projects in predictive analytics, NLP, and model evaluation.
- Published methodology in peer-reviewed journals, establishing benchmarks for ethical, effective LLM use in educational technology.



## WORK EXPERIENCE

### Chief of Staff, Chief Data and Analytics Officer (FSB)

USAA

11/2023 - 11/2024

Achievements/Tasks

- **Spearheaded USAA FSB's first AI & Data Strategy**, embedding AI/ML and automation to accelerate digital transformation across a \$126B portfolio.
- **Engineered systems and automated decision workflows**, cutting cycle times 64% and enhancing analytics, operations, and executive alignment.
- **Designed the first AI-informed Balanced Scorecard**, integrating predictive metrics and model outputs into enterprise performance management.
- **Deployed data-driven decision frameworks**, improving forecasting accuracy and delivering a \$2.7M business impact in Q1 alone.

### Business Strategy and Planning Director, Bank Technology and Data

USAA

01/2023 - 11/2023

Achievements/Tasks

- **Aligned AI/ML initiatives with enterprise priorities**, leading innovation workstreams on automation and digital engagement across bank operations.
- **Powered MSRgpt pilot**, a proprietary Generative AI tool that enhanced customer interactions and improved internal decision efficiency.
- **Championed workforce transformation**, combining executive coaching, EQ development, and upskilling to improve team resilience and digital fluency.
- **Led adoption impact tracking**, using OKRs, KPIs, and gap analysis to evaluate AI maturity and boost employee engagement by 23%.

### Executive Operational Planning Manager, CEO Chief of Staff

USAA

12/2021 - 12/2022

Achievements/Tasks

- **Architected CEO strategy using McKinsey Model**, reallocating time for strategic focus by 2x and targeting CEO action-to-decision metrics..
- **Streamlined CEO workflows**, introducing 8 new processes and automating core functions, increasing efficiency by 25%, and slashing closure times by 80%.
- **Strengthened executive collaboration**, aligning 27+ leaders across 12 siloed teams and elevating trust, communication, and Board-authorized outcomes.
- **Institutionalized Chief of Staff function**, creating ops scorecards and cultural rituals, improving strategic alignment, executive clarity, and engagement.

### Change Partner (OCM)

USAA

11/2020 - 12/2021

Achievements/Tasks

- **Led enterprise change strategy** impacting 3,500 employees across Consumer Lending and Complaints, increasing compliance rates from 22% to 99%.
- **Developed and delivered 57 change strategies and artifacts**, aligning with Prosci methodology and enterprise risk frameworks to ensure seamless adoption.
- **Integrated customer insights into transformation planning**, ensuring initiatives were human-centered and strategically aligned with organizational values.

### Chief Master Sergeant (E-9) | Senior Enlisted Leader & Executive HR Director

United States Air Force

10/2001 - 08/2020

*Promoted to E-9 in under 17 years — a milestone achieved by less than 1% of enlisted members. Led organizational strategy, people operations, and global readiness initiatives across combat zones, training commands, and executive-level environments.*

Achievements/Tasks

- **Directed HR and organizational strategy for 534 personnel**, leading through COVID-19 while improving staffing, retention, and engagement outcomes.
- **Modernized USAF Basic Military Training**, reducing attrition and saving \$1.8M annually through curriculum redesign and structural improvements.
- **Founded a world-class Airman Development Center**, integrating emotional intelligence and leadership training into the core development framework.
- **Created and scaled the Air Force's #1 DE&I Program**, recognized with the General Welsh Award for advancing inclusion as a strategic priority.
- **Advised senior leaders at USCENCOM FHQ**, collaborating directly with SECDEF Austin on theater-wide people strategy and force posture.
- **Led three combat tours in Afghanistan** and served as a top-performing Military Training Instructor (MTI). **Recognized as 19th Air Force First Sergeant of the Year**, AFMC NCO of the Year, and recipient of the **Air Force's Outstanding Airman of the Year Ribbon** (awarded to only 12 annually).



## EDUCATION

### Doctor of Philosophy - Organizational Leadership & Program Evaluation

University of the Incarnate Word

### Post Graduate Certificate - Artificial Intelligence & Machine Learning

Cornell University

### Master of Science - Organizational Development

University of the Incarnate Word

### Post Graduate Certificate - Artificial Intelligence and Machine Learning

University of Texas - Austin

### Post Graduate Certificate - Strategic Artificial Intelligence

Houston Christian University

### Master of Arts - Psychology

Northcentral University



## CERTIFICATES

SHRM-SCP (06/2023 - Present)

SaFE 5.0 Agilist (06/2022 - Present)

PROSCI Change Management (05/2021 - Present)

EQi-2.0 (Emotional Intelligence Practitioner) (12/2019 - Present)



## PUBLICATIONS

*Journal Article*

### Exploratory Cluster Analysis of Technology Use and Activities During COVID-19 in Relation to Mental Health Conditions

2023

Journal of Adolescent Health

*Book Chapter*

### Assessing Changes in Adult Online Learners' Motivation: A Grounded Bibliometric Analysis

2023

Motivation and Momentum in Adult Online Learning

*Journal Article*

### Self-Reflection and Socialization in Early Career Research: A LACOID-Based Text Mining Approach

2024

AERA

*Journal Article*

### AI Integration in Academia: Investigating the Impact on Faculty Organizational Belongingness

2024

APA



## SOFT SKILLS

Written Communication

Verbal Communication

Executive Presentation

Cross-Cultural Communication

Technical Translation

Conflict Resolution

Strategic Leadership

Performance Management

Emotional Intelligence

Empathy

Social Awareness

Relationship Management

Cultural Intelligence

Critical Thinking

Systems Thinking

Root Cause Analysis

Innovation Mindset

Project Leadership

Stakeholder Management

Quality Assurance

Resource Management

Continuous Learning

Adaptability

Resilience

Growth Mindset

Technology Adoption

Integrity

Cross-Functional Collaboration