EMMANUEL OYEKANLU, Ph.D.

PRINCIPAL AI ENGINEER | AI / DATA / ENTERPRISE SYSTEMS ARCHITECT

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SUMMARY

Principal AI Engineer and Enterprise Architect with a track record of delivering production AI, data engineering, and enterprise-architecture programs across manufacturing, financial services, healthcare, telecommunications, and entertainment. Builds full-stack machine learning, agentic AI, and GPU-accelerated systems that ship, with ML models consistently exceeding 94% accuracy, across on-prem, GCP, Azure, and AWS clouds. Experienced defining enterprise data/AI north-star architecture and capability roadmaps, leading cross-functional teams, mentoring, and translating platform strategy into measurable business outcomes.

CORE COMPETENCIES

OpenVINO | TOGAF Enterprise Architect | ArchiMate | Archi | Sparx | Databricks | SQL/NoSQL Databases | Data & System Architecture | dbt | Machine Learning & AI Applications | GCP | AWS | Azure | Computer Vision & Generative AI | Agentic AI | CrewAI | OpenCV | CUDA | Microservices Architecture | CI/CD | Cross-Functional Leadership | Enterprise AI | Nvidia Run:AI | Algorithms | Process Improvement | Software Development

EXPERIENCE

ForgeZen (Startup)

Principal AI Solutions Architect - Consultant (June 2026 - Present)

- Architected a provider-agnostic multi-agent AI platform (naming/brand generation, market intelligence, enterprise assessment) via a providers/ abstraction layer decoupled from any single LLM vendor (Anthropic, OpenAI).
- Designed model routing and cost-governance architecture tiering frontier vs. lightweight models to optimize cost vs. accuracy.
- Built a prompt registry and versioning system (externalized .txt prompts, runtime variable injection, Pydantic-validated outputs).
- Implemented RAG grounding with citation display over a 210-document enterprise knowledge base using pgvector.
- Set engineering/security standards for a multi-tenant SaaS: tenant isolation, RBAC, per-tenant AI cost tracking, audit logging.
- CrewAI agentic prototyping and deployment. Owned full-stack technical direction (Django/DRF, Next.js, Celery, Azure) as sole technical decision-maker.

CohnReznick LLC

Principal AI Solutions Software Engineer - Consultant (April 2026 - June 2026)

- Reported to CohnReznick's Global Head of AI; designed, built, and deployed AI-native solutions for financial, banking, and auditing workflows.
- Architected AI-enabled applications using LLMs, SLMs, MLMs, ML models/agents, GenAI, RAG/GraphRAG, and NLP/NLM techniques.
- Built full-stack web applications integrated with Claude Code, GitHub Copilot, and Azure AI services.
- Designed secure data connectors/integrations with cybersecurity, risk, and IAM teams for compliance and stability.
- Documented architecture and best practices; led company-wide AI initiatives with leadership and cross-functional teams.

Handshake AI - Project Proctor (Project Darwin)

AI Fellow - Consultant (March 2026 - Ongoing)

- Training LLMs to better support STEM-based reasoning.

Mercor (contracted to a leading AI research lab)

Machine Learning Engineer - Data/LLM/Prompt Engineering Consultant (Sept 2025 - Ongoing)

- Orchestrated reproducible ML pipelines and LLM training workflows under ephemeral execution constraints; benchmarked model performance and generated agentic trajectories for autonomous AI research.
- Directed LLM-guided EDA strategies (Kaggle-style datasets), ETL/ELT, feature engineering, and GPU-optimized PyTorch DataLoaders.
- Architected prompt-driven orchestration for Slurm-scheduled NVIDIA A100 GPU environments on Rocky Linux (RHEL-compatible).
- Applied gradient checkpointing, mixed precision (FP16/BF16), and distributed data parallelism to maximize A100 utilization.

- Shaped LLM-agent problem-solving trajectories end-to-end, from EDA to full-dataset optimization and submission.

Consultant (VerzX, Zintro)

DevOps Architecture for Edge Computing & IoT (October 2024 - Ongoing) | NY, USA

- System reliability & risk assessment; MLOps for edge computing, industrial IoT, and large-scale IoT device deployments.

Consultant (VisasQ/Coleman)

AI: Technology Trends and Industrial Applications (August 2024 - Ongoing) | NY, USA

- AI/ML solution deployments and project lifecycle management.

Consultant (GIS Ltd)

Digital Transformation (DX) Specialist (May 2024 - June 2024) | Remote, USA

- Architected secure, data-privacy-first digital transformation templates for large and medium enterprises.
- Defined data engineering, management, architecture, privacy, and cybersecurity specs for enterprise/government digital transformation.
- Evaluated Google ADK, Vertex AI, Google AI Studio, Workspace, and Gemini for enterprise AI transformation.

Corning Incorporated

Software and Systems Project Engineer (September 2019 - January 2024) | Painted Post, NY

- Generative AI (2023-2024): Built a customized ChatGPT interface for industrial use (Docker, PostgreSQL, Vue, Django); enabled RAG on GCP Vertex AI with GPT4All; architected cross-domain system scalability for production AI deployment.
- Software Engineer (2023): Built anomaly detection for glass-surface fault contours using Databricks (Delta Lake, Unity Catalog), SQL, Spark, Python (pyOD, KNN, Isolation Forest); shipped a Tkinter/PyInstaller desktop app cutting product waste 31%; input whitelisting for injection-attack prevention; ongoing MLOps/CI-CD/DevSecOps and drift monitoring.
- Lead Architect, Computer Vision & IoT (2023): Deployed real-time vision inspection on Jetson AGX Orin & industrial PCs at <15ms latency / 99.2% accuracy, cutting defect escape rate 40%; OpenVINO for quantization/serving ONNX/PyTorch/TensorFlow on edge CPUs/NPUs/GPUs; Flink+Kafka for rotating-machine event monitoring; trained vision models on an A100 HPC cluster (Rocky Linux, Slurm); led MLOps CI/CD (AWS SageMaker, ONNX, GitLab CI, Docker) to 50+ edge devices; built hybrid AWS-edge architecture (IoT Greengrass, Kinesis Video Streams) integrated with MES/PLC via OPC-UA/REST; mentored 3 engineers on edge optimization and OpenCV best practices.
- NLP Engineer (2022-2023): Built Spacy/Gensim/TF-IDF/LSI + LSTM fault-prediction models on Kafka/Flink streaming data (rolling FFT, Z-score, threshold alerts), cutting fault ID time ~97%; deployed on GCP Cloud Run with BigQuery/BigQuery ML; input whitelisting and GAN-based spoofing-attack training data; ongoing MLOps/CI-CD/DevSecOps.
- ML Engineer (2020): Built a VGG16 + LLM-prompted image recommendation system (Gensim/Spacy) cutting fault inferencing from ~2 weeks to <1 minute; Databricks (Delta Lake, Unity Catalog, MLflow) for ELT and modeling; Flask API interface; FAISS + HNSW/IVF for high-speed nearest-neighbor image search; GAN-based training data for model hardening; MLOps/DevSecOps and drift monitoring.
- Project Engineer, IoT Vision & Imaging for COVID-19 (2020): Led a YOLO + Jetson Nano/Xavier/Raspberry Pi COVID-19 social-distancing enforcement tool; GeoPandas/Fiona/Shapely for floor-plan analysis and geofencing; streamed IoT data to GCP Pub/Sub, Dataflow, BigQuery, Cloud Storage, Cloud Run dashboard; 93% cheaper than a comparable vendor solution; TOGAF/Zachman gap analysis for enterprise-wide adoption; also built a vaccine-vial tracking solution using Hough Transforms, image segmentation, and CUDA-accelerated OpenCV on Linux HPC/C++, successfully tracking vials across manufacturing stages.
- Project Engineer, Smart Manufacturing (2019-2023): Led a cross-functional, multi-vendor team (Corning, Verizon, AWS, Gestalt Robotics) defining private-5G AGV/AMR enterprise architecture; full ownership of technical AI architecture and enterprise gap analysis; GeoPandas/Shapely for floor plans, geofences, and navigation networks; PoC/PoV for 5G and WiFi AGV/AMR traffic; LiDAR + camera + YOLOv8 fusion for SLAM and dynamic map updates; data governance and MLOps for enterprise-wide AI adoption; AWS IoT Events analytics with Jetson Nano, Raspberry Pi, Coral TPU edge deployments; led the Factory Pulse IIoT initiative; real-time AGV/AMR battery monitoring via Google Pub/Sub; CUDA/Linux HPC FFT-based bearing anomaly detection deployed as gRPC microservices (Docker/Kubernetes); 97%+ accurate AGV/AMR product classification (Docker + YOLO) over private 5G with AWS backend; resulting IEEE journal paper (with Verizon engineers) and an approved US Patent (Integrated Manufacturing Systems Architecture); Python/Spark/Airflow/VBA/Bokeh/Power BI dashboard cutting fault ID time from ~2 weeks to 7 seconds.

Comcast

Data Science Engineer (March 2019 - September 2019) | Philadelphia, PA

- Analyzed real-time and batch data via Databricks, Presto, Spark, Kafka, and AWS (Kinesis, S3, Elasticsearch, Lambda).
- Analyzed network health data across ~29M devices plus customer clickstream data for root-cause analysis, improving customer experience and reducing churn.

Drexel University

Adjunct Professor, Applied Physics (September 2018 - March 2019) | Philadelphia, PA

- Taught applied/computational physics (vectors, statics, kinematics, system dynamics) with emphasis on big-data technologies; supervised and evaluated student projects; consistently high student evaluation ratings.

Ph.D. & M.Sc. Studies - Drexel University / Blekinge Institute of Technology

Doctoral Researcher, Electrical Engineering (August 2008 - August 2018)

- Ph.D. focused on embedded wavelet-based statistical ML at the edge of large IIoT/smart-grid networks using a fixed-point C28x DSP and Embedded C.
- Big-data analysis of grid load flow/demand using modified Dijkstra and Floyd-Warshall algorithms on GPU (OpenCL/CUDA, Linux).
- Developed the industry's first Embedded-C wavelet suite for the C28x DSP; applied to ECG signal characterization and low-voltage powerline analysis; studied EV/non-linear load grid stability effects.
- Worked briefly with the US Department of Energy on grid effects of large non-linear loads and mixed renewable/non-renewable generation.
- Applied QGIS/PostGIS spatial risk assessment to model long-term weather impact on grid stability; studied V2I effects and 3GPP/ITU standards for smart grid/smart cities.

Rechez Communications

Network Data & Systems Engineer (February 2005 - August 2008) | Awka, Nigeria

- Defined an enterprise-grade network data/monitoring architecture across LAN, WAN, VSAT, and consumer access networks (Fedora Linux streaming ingestion).
- Led the technical strategy behind NCC regulatory license approval, enabling expansion into underserved regions.
- Redesigned vendor/connectivity strategy (direct link to Ariave Satcom, Israel), cutting recurring operational costs 42%.

TECHNICAL SKILLS

Backend: Python, R, C#, Rust, MATLAB, C++, Dask, VBA, dbt, Jinja, Scala, SBT, Java, PySpark, SQL, GoogleSQL, PromQL, SparkSQL, KQL, Hadoop, Kotlin, Flink, Apache Beam, Kafka, Apache NiFi, Hive, Pig, Storm, Zookeeper

Frontend: JavaScript, RESTful APIs, Vue, Nuxt3, Ruby, CSS, HTML, Flask, PyQT5, Tkinter, Sigma Computing, Power BI, Tableau, GraphQL

Test Automation: Selenium, Playwright

Cloud: BigQuery, GCP, Vertex AI, Cloud Run, Pub/Sub, Dataflow, Azure Databricks, Azure Events, Azure Functions, Azure Event Hub, GCE, GKE, AWS Databricks, AWS Glue, AWS SageMaker, AWS EMR, Snowflake, Oracle ERP Cloud

Databases: PostgreSQL, SQLite, MongoDB, Snowflake, Kdb+, Neo4J (Cypher), Cassandra, ScyllaDB

Vector Databases: PGVector, Pinecone, Milvus, Zilliz

Enterprise Architecture: ER/Studio, ArchiMate (TOGAF), Archi, Erwin, LucidChart, Sparx Enterprise Architect

Agentic AI: n8n, Node-RED, LangChain, LangGraph, LangSmith, Airflow, LangFlow, CrewAI, MCP

HPC & GPU: CUDA, OpenCL, Slurm, Nvidia Run:AI, Rocky Linux (RHEL-compatible)

DevOps/CI-CD/MLOps: Docker, TensorFlow TFX, ZenML, MLflow, Kubernetes, Git, GitLab, Airflow, Terraform, Jenkins, GitHub Actions

Dev Platforms: VSCode, .NET, Jupyter Notebook, IntelliJ IDEA, PowerShell, Linux

Platforms & Workflows: Quickbase, n8n, Agentic AI, Palantir Foundry

ML Libraries: TensorFlow, Keras, RAPIDS

Machine Vision: OpenCV, Halcon, OpenVINO

Site Reliability: Uptime Kuma, Prometheus, Datadog, Grafana

Cybersecurity: Linux, Splunk (SIEM), TCP/IP, Suricata, Wireshark, TCPDump

General: PLC applications, Embedded Systems (C28x, TI DSPs), Raspberry Pi, Nvidia IoT devices

Standards: GMP, GAMP5, SEMI, HIPAA, HL7, FHIR

OPEN-SOURCE PROJECTS

github.com/manuelbomi | scholar.google.com/citations?user=S-jTMfkAAAAJ | Website: emmanueloyekanlu.com

EDUCATION

- Ph.D. in Electrical Engineering, Drexel University, Philadelphia, USA
- M.Sc. in Electrical Engineering, Blekinge Institute of Technology, Karlskrona, Sweden
- M.Sc. in Signal Processing, Blekinge Institute of Technology, Karlskrona, Sweden
- M.Sc. in Telecommunications, Blekinge Institute of Technology, Karlskrona, Sweden
- B.Tech. in Computer Engineering, Ladoke Akintola University of Technology, Nigeria
- Data Science - Data to Insights (Coursework), Massachusetts Institute of Technology (MIT), USA

CERTIFICATIONS

- Databricks Certified Data Engineer Professional / Associate; IBM: ETL and Data Pipelines with Shell, Airflow and Kafka
- Databricks Certified Machine Learning Associate; Databricks Generative AI Fundamentals
- Google Certified Cybersecurity Professional (Risk & Cybersecurity Assessment)
- Palantir Foundry & AIP for Enterprise Organizations; Palantir Foundry & AIP Builder Foundation
- Yellow Belt & Green Belt - Project Excellence (Corning); Black Belt Training (Corning); Leadership Principles - Harvard University

VOLUNTARY ACTIVITIES

Board Member, IEEE Bridge HKN Magazine (Editorial Board)

AWARDS

- Corning Innovation Award: 5G PoC, Use Case Development and Testing
- Corning Quality Award: IP Recognition
- Corning Performance Excellence Award: AI Recommendation System Design (cordierite filters)
- Drexel University Teaching Excellence Award
- Dean's Fellowship Award, Drexel University (2014, 2016)
- Freshmen Engineering Fellow Award, Drexel University
- Schweitzer Engineering Laboratory (SEL) Equipment Award, Ph.D. studies
- National Science Foundation (NSF) Sponsorship Award - Entrepreneurial Lead, Digital and Scientific Literacy and Training Solutions for Green Energy and Environmental Engineering

PATENT & SELECTED PUBLICATIONS

- Oyekanlu, E. A., Thomas III, W. P., "Integrated Manufacturing Systems Architecture," US Patent 11,878,422; Nov. 2022
- Book (Editor): Applied AI and Multimedia Technologies for Smart Manufacturing and CPS Applications, IGI Global, April 2023
- Oyekanlu, E., Kuhn, D., Mulroy, G., "Data Engineering for the Factory of the Future, Part 1 & Part 2," IGI Global, April 2023
- Oyekanlu, E. A. et al., "A Review of Recent Advances in Automated Guided Vehicle Technologies...," IEEE Access, vol. 8, 2020
- Oyekanlu, E., "Predictive edge computing for time series of industrial IoT and large scale critical infrastructure...," IEEE Big Data, 2017
- Oyekanlu, E., "Distributed Osmotic Computing Approach to Implementation of Explainable Predictive Deep Learning...," IEEE AIKE, 2018
- Oyekanlu, E., Onidare, S., Oladele, P., "Towards statistical machine learning for edge analytics in large scale networks...," SmaGriMet, 2018
- Oyekanlu, E., "Osmotic Collaborative Computing for Machine Learning and Cybersecurity Applications...," IEEE CIC, 2018
- Oyekanlu, E., Scoles, K., Oladele, P., "Arbitrary Waveform Generation for IoT and CPS Communication Networks Using C28x TMS320C2000 DSP," IEEE Infocomm Tech., 2018
- Chen, J., Oyekanlu, E., Onidare, S., Kulesza, W., "The Evaluation of the Gaussian Mixture Probability Hypothesis Density Approach for Multi-target Tracking," IEEE IST, 2010
- Uddin, J., Oyekanlu, E., Kim, C.H., Kim, J.M., "High Performance Computing for Large Graphs of Internet Applications Using GPU," J. Multimedia and Ubiquitous Engineering, Vol. 9, 2014
- Oyekanlu, E., "Fuzzy Inference Based Stability Optimization for IoT Data Centers DC Microgrids...," Journal of Energy, Vol. 68, Issue 1