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Description automatically generatedKACEM BOUFELLIGA (Location: Bozeman, MT)**

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| **Summary of Qualifications** |  |  | **Technical Skills** |
| Creative and pragmatic software leader with a strong track record of delivering high-impact solutions across complex domains. Experienced in leading full product lifecycles, aligning engineering execution with business strategy, and solving operational challenges through platform design, automation, and intelligent systems.  Recognized for driving transformation in mission-critical environments—from modernizing compliance systems to enabling real-time simulation and automation at scale. Adept at engaging with stakeholders across disciplines and delivering clear results in dynamic, fast-moving contexts.  Proven ability to balance innovation with execution, architecting systems that scale, adapt, and generate measurable value. Equally effective in guiding teams, mentoring engineers, and fostering collaboration across geographically distributed organizations. |  |  | * **Programming** Java, Clojure, Python, TypeScript, JavaScript, HTML, CSS, Nodejs, Shell scripts, MS SQL, Oracle, PostgreSql, MySQL, MongoDB, Snowflake, MuleSoft, Databricks/Spark, Hibernate, Ibatis, JOOQ, SwiftUI, ReactJS, Vaadin, MQTT, AMQP, XMPP, KAFKA, PULSAR, REDIS, RABBITMQ, Spring Boot, Elastic Search * **Software Tools** Docker, Kubernetes, TravisCI, Gitlab Pipeline, Terraform, Helms, Git, Gitlab, Perforce, Svn, Maven * **Hardware** Raspberry Pi, NVIDIA Jetson, Odroid, UDOO x86, Arduino, IBM 308x-309x series mainframes running MVS (TSO Shell), DOS/VSE , IBM x.86 PCs/Servers running Windows and Linux * **Languages** Native in English and French |

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* Enabled full privacy compliance for all T-Mobile customers by architecting and delivering an automated platform to onboard hundreds of internal systems, reducing regulatory risk and accelerating onboarding by 10×.
* **Engineered a reinforcement learning (RL) trading agent for a hedge fund,** leveraging real-time market data, RSI, and candlestick pattern analysis to optimize buy/sell decisions, achieving customer goals while reducing portfolio drawdowns compared to prior strategies.
* Delivered edge-connected platforms supporting real-time sensor data ingestion and AI-based alerting for fraud detection, geofencing violations, and live telemetry monitoring in banking and telecom environments**.**
* Designed and deployed AI solutions to automate document recognition and facial verification for government-issued IDs, streamlining KYC and customer onboarding workflows at scale**.**
* Led the development of high-accuracy enterprise platforms including a deep learning-based check processing system with 99.3% accuracy, demonstrating leadership in applied AI and scalable automation**.**

# **Professional Experience**

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**Exadel (formerly Coppei)** 04.2021 – Present

**Solutions Architect & Principal Software Engineer   
*Tech Stack:****Java (Spring Boot, Spring Cloud, Spring Security, Spring Data), Python, C++, React, Vaadin, Apache Kafka, Apache Pulsar, RabbitMQ, MuleSoft, Apache Camel, Kubernetes, Redis, Elasticsearch, MySQL, PostgreSQL, Oracle, Databricks, Splunk, Unreal Engine, AirSim, PX4, QGroundControl, Cesium for Unreal, CesiumJS, YOLO, Detectree2 / DeepForest, Linux, QGIS, SNMP, Telegraf, Prometheus, Grafana, and Logstash*

**US Air Force - Autonomous Combat Simulation (MVP Phase I)**

* Architected a real-time 3D combat simulation for joint Air Force/Navy operations using **Unreal Engine 5.5** with custom C++ plugins, integrating **AirSim** (PX4/QGroundControl) for autonomous flight planning (F-35/F/A-18 squadrons, aerial refueling) and dynamic environmental effects (wind, atmospheric pressure).
* Developed a **custom Unreal plugin** to synchronize simulation data with **Cesium Ion** for 3D geospatial mapping and integrate **YOLO-based computer vision** into AirSim for real-time object detection/segmentation (e.g., adversarial aircraft, naval assets).
* Deployed on **Linux servers** to orchestrate PX4, QGroundControl, and AirSim workflows, enabling multi-vehicle coordination (blue/red teams), telemetry streaming, and scenario scripting.

**Microsoft - Global Data Center Division: Supply Chain Visualization Platform**

* Designed and built a visualization platform to track global server shipments from vendor warehouses to data centers, integrating handoffs at hubs and all modes of transport. Combined immersive 3D experiences in Unreal Engine with Cesium for Unreal for asset tracking down to rack-level, and developed 2D React-based maps for quick overviews. Engineered a custom C++ Unreal plugin to embed and sync the React UI within Unreal, enabling users to select data centers, monitor in-transit orders, disruptions, and alternate routes, and navigate detailed CAD facility layouts.

**T-Mobile - Privacy Compliance Platform (CCPA Initiative)**

* Led architecture and delivery of a fully automated, agent-based integration platform for CCPA-compliant onboarding of T-Mobile internal systems.
* Implemented Java/Spring Boot microservices in Docker containers on Kubernetes, integrating Apigee for API authorization, and using HashiCorp tools for secrets management and service discovery.
* Built a rule-based automata system for dynamic routing and multi-type identification across integrated systems.
* Automated metadata generation from Collibra to provide both data privacy fields and field-level security attributes for each system, enabling agent proxies to enforce appropriate controls per system.
* Integrated Bouncy Castle to encrypt data in transit and applied field masking according to rules defined in Collibra metadata.
* Established resilient service registration with ZooKeeper and health monitoring via Kubernetes Probes and Spring Boot Actuator.
* Scaled onboarding from 2 to 10 systems per month, reducing costs and exceeding compliance targets.

**Hedge Fund – RL Trading Agent**

**Phase I (2021): LSTM Model & RL Environment**  
Tech Stack: Python 3.7, OpenAI Gym 0.17, backtesting.py 0.3, TA-Lib, Keras 2.3, TensorFlow 1.15, pandas 1.1, NumPy 1.18, Matplotlib 3.2, Docker 19.03

* Developed a custom OpenAI Gym trading environment where the RL agent interacted with historical price data, executed trades, and was rewarded based on portfolio performance.
* Incorporated candlestick pattern recognition and RSI (via TA-Lib) as input features, providing technical indicators at each decision step.
* Trained a Keras LSTM model on 10 years of market data and proprietary signals, enabling the agent to identify actionable patterns like RSI extremes and candlestick formations.
* Implemented and compared PPO and DQN algorithms, tuning rewards to balance profit, risk, and trading costs for optimal strategy learning.
* Evaluated strategies with backtesting.py on out-of-sample data, benchmarking against traditional approaches to ensure robustness before deployment.

**Phase II (2024–2025): Hybrid AI Architecture Scaling for Multi-Agent Risk Management**  
Tech Stack: Python 3.10, PyTorch 2.x, TensorFlow 2.12, Stable Baselines3 2.0, RedisTimeSeries 2.8, Apache Kafka 3.6, TA-Lib, LSTM & Transformer models, pandas 2.x, Docker 24, Kubernetes 1.29

* Upgraded the system to deploy specialized AI agents for different risk profiles (e.g., low-risk income strategies vs. high-risk momentum trades).
* **LSTM-based agents** focused on short-term patterns (e.g., intraday price swings, RSI fluctuations) within rolling 15-minute windows, using Stable Baselines3 implementations of PPO and Soft Actor-Critic (SAC).
* **Transformer-based agents** (built with PyTorch’s nn.Transformer) identified broader trends and correlations across hours/days, improving strategic positioning and adaptability.
* Used Kubernetes to dynamically scale resources for agents based on market volatility and trading activity.
* Streamed real-time data (prices, news sentiment) via RedisTimeSeries and Kafka, letting agents share insights and avoid conflicting trades.
* Added circuit breakers to pause overactive agents during extreme volatility (e.g., detected via candlestick anomalies).

**Neuron Edge Technologies LLC** 12.2019 – 04.2021

**AI for Embedded & Edge Devices - Principal Architect**

* Led the design and deployment of AI solutions for edge hardware across banking and telecom sectors. Delivered real-time ID verification by extracting facial data from government ID scanners and matching it via embedded camera streams using computer vision and deep learning.
* Architected data collection and telemetry pipelines from embedded devices to cloud monitoring systems, enabling fraud and perimeter breach detection. Oversaw end-to-end technical delivery, including environment setup, CI/CD automation, and partner integrations with banks and telcos.

**Speckeye Technology** 06.2012 – 10.2019

**AI & Enterprise Automation for Banking and Telecom - Principal Architect**

* Led architecture and development across multiple enterprise platforms used by banks and telecom providers. Delivered an AI-powered check processing system achieving **99.3% accuracy** in handwritten courtesy amount recognition, handling up to **400,000 checks/day**. Designed the full deep learning pipeline, from image normalization and digit segmentation to CNN modeling and high-performance C++ deployment using gRPC.
* Engineered a dynamic foreign exchange platform supporting options and futures trading, processing over **€2B annually** with real-time pricing based on the **Black-Scholes model**. Migrated legacy frontends to Angular for responsive UI and integrated trading workflows.
* Built an automated contract validation platform for telecom operators, capable of validating over **100,000 contracts/day** using a microservice-based agent architecture. System generated daily compliance and financial reports, significantly improving scalability and audit readiness.

**Fedaso || Orone Group** 04.2010 – 05.2012

**Multi-Sector Enterprise Software Delivery - Principal Architect**

* Led distributed R&D and engineering teams across Europe and North Africa to deliver enterprise software for finance, insurance, retail, and government sectors. Drove product roadmaps, technology selection, and end-to-end delivery, modernizing legacy systems through REST-based microservices, Agile/Scrum adoption, and database decoupling. Spearheaded EBP’s public tender system overhaul with MVC architecture and a scalable notification engine for automated B2B tender matching.
* Enhanced scalability by replacing stored procedures with a cache-enabled business logic layer, reducing platform load and accelerating response times for high-volume transactions. These upgrades improved system maintainability while supporting real-time demands across global deployments.

# **Education**

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**University of Michigan** B.S. Mathematics, Minor Computer Science