

BUTACU IONEL-CATALIN

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SUMMARY

Machine Learning Engineer with 3+ years of production experience, dedicated to bridging the gap between research and deployment. Leverages strong C++/Python skills to build high-performance AI integration layers, from RAG agents to edge-optimized NPU models. Combines academic AI depth with industrial engineering discipline to ensure intelligent systems are robust, scalable, and production-ready.

CORE SPECIALTIES

ML Core:	Deep Learning, NLP, Model Optimization, Fine-tuning, Model Deployment
AI Systems:	RAG, Agentic Systems, Small Models, Prompt Engineering, Guardrails
Production Software:	C++/Qt, Multithreading, REST APIs, Serialization, UI Components, Real-Time Systems
Languages & Tools:	Python, C++17/20, SQL, PyTorch, TensorFlow, Docker, Git, CMake, Oracle Cloud

PROFESSIONAL EXPERIENCE

Gemini CAD Systems	Iași, RO
Software Engineer	June 2023 – Present

- Engineered production-grade C++ modules for performance and cross-platform compatibility.
- Implemented multithreaded rendering pipeline using QThread/QtConcurrent.
- Designed versioned serialization system for backward-compatible data migration.
- Built REST API integration layer using QNetworkAccessManager for cloud sync.
- Led Qt 5.8 to 6.12 migration, refactoring deprecated APIs for production stability.
- Implemented internationalization and role-based UI visibility using Qt Translator.

Software Engineer Intern	August 2022 – May 2023
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- Developed interactive UI using Qt signal/slot and event-driven patterns.
- Refactored static UI components to improve rendering performance.
- Used GitLab, Jenkins CI/CD, and Agile workflows to deliver incremental updates.

Special Telecommunications Service (STS)	Botoșani, RO
IT Support Staff — Electoral IT Systems	August 2020 – September 2020

- Provided technical support for electoral IT systems (e.g., SIMPV/SICPV).
- Assisted polling-station staff with application usage and hardware operation.
- Ensured system stability through monitoring and incident response.

EDUCATION

Gheorghe Asachi Technical University of Iași	Iași, RO
Master of Science in Artificial Intelligence	October 2024 - June 2026

Advanced Coursework: Neural Networks, Machine Learning, Natural Language Processing (NLP), Reinforcement Learning, Multi-Agent Systems, Cloud Computing, Big Data Techniques, Edge Computing Applications, Intelligent Cyber-Security

Bachelor of Science in Automatic Control and Applied Informatics	October 2020 - June 2024
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Core Curriculum: Advanced Computer Programming, Data Structures & Algorithms, Database Management Systems, Real-Time Programming, Systems Theory, Microprocessor-Based Systems, Embedded Systems Engineering, Control Engineering, Computer Networks, Neural Networks & Fuzzy Logic, Knowledge-Based Systems

CERTIFICATIONS

- Oracle Cloud Infrastructure 2025 Data Science Professional (1Z0-1110-25)
- Oracle Cloud Infrastructure 2025 Generative AI Professional (1Z0-1127-25)
- Oracle Cloud Infrastructure 2025 AI Vector Search Professional (1Z0-184-25)
- Oracle Cloud Infrastructure 2025 AI Foundations Associate (1Z0-1122-25)
- Oracle Analytics Cloud 2025 Certified Professional (1Z0-1041-25)

PROJECTS

AI-Enhanced Firewall & Intrusion Detection	2026
Built IDS/IPS pipeline with Snort for SQL injection detection. Trained real-time classifier and clustering-based pattern recognition to block threats.	
Ant Colony Optimization Simulation	2025
Multi-agent simulation using Mesa and Solara for interactive visualization. Compared pheromone-based pathfinding on dynamic graphs.	
Real-Time Hand Sign Recognition	2025
YOLOv5n-based detector trained on HaGRID (Hand Gesture Recognition). Deployed on NPU, CPU, and GPU via ONNX/TFLite INT8 quantization for embedded devices.	
RAG-Based Pharmaceutical Assistant	2025
Local RAG system with vector embeddings for medication retrieval. Provides drug interactions, dosage, and contraindication alerts via LLM chat.	
Metaheuristic Optimization Framework	2025
Optuna-style Python framework implementing GA (Genetic Algorithm), EA (Evolutionary Algorithm), and SOA (Stochastic Optimization Algorithm) solvers for constraint satisfaction and optimization problems.	
WiDS Datathon — 8th Place National	2025
ML pipeline for fMRI-based brain age prediction. Feature engineering on neuroimaging data, ensemble modeling, and hyperparameter tuning.	

VOLUNTEER EXPERIENCE

LOCAL BEST Group Iași	Iași, RO
IT Department Coordinator	Sep 2023 – Aug 2024
<ul style="list-style-type: none">◦ Led IT operations and supported the technical infrastructure for organizational events.◦ Mentored volunteers and coordinated execution of technical projects.◦ Managed hardware, software licensing, and network resources.	
Event Coordinator — JobShop Career Event	Nov 2022 – Apr 2023
<ul style="list-style-type: none">◦ Coordinated logistics and operations for a large student–industry career event.◦ Managed scheduling, partner engagement, and on-site execution.◦ Improved attendee experience through strategic planning and workflow optimization.	
TOPICS Responsible — Prove It 24H Techathon	Dec 2021 – Mar 2022
<ul style="list-style-type: none">◦ Defined technical requirements and coordinated hackathon logistics.◦ Supported participants with rules, resources, and real-time assistance.◦ Facilitated communication between organizers, industry mentors, and teams.	
IT Responsible — BEST Training Weekend	Jan 2021 – May 2022
<ul style="list-style-type: none">◦ Developed and maintained the event website using HTML, CSS, and JavaScript.◦ Collaborated with design and marketing teams to fix UI/JS issues.	

ADDITIONAL SKILLS

Web & Data:	React, Next.js, TypeScript, Node.js, Firebase, MySQL, PostgreSQL, WordPress
Development:	CI/CD, Jenkins, GitHub Actions, Agile/Scrum, Code Reviews, Unit Testing, Linux
Soft Skills:	Problem Solving, Clear Technical Communication, Simplifying Complex Ideas