

# 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

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

## PROFESSIONAL EXPERIENCE

<b>Gemini CAD Systems</b>	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.

<b>Special Telecommunications Service (STS)</b>	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

<b>Gheorghe Asachi Technical University of Iași</b>	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

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

VOLUNTEER EXPERIENCE

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

ADDITIONAL SKILLS

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