

BUTACU IONEL-CATALIN

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SUMMARY

Machine Learning Engineer with 3+ years of production experience, specializing in bridging research and deployment. Expert in Python/C++ integration for high-performance AI systems, from Generative AI and RAG agents to edge-optimized NPU models. Dedicated to building scalable, production-ready solutions (LLMs, multimodal AI) with industrial engineering discipline.

PROFESSIONAL EXPERIENCE

Gemini CAD Systems

Software Engineer

Iași, RO

June 2023 – Present

- Integrated C++/Qt functional modules into production systems, ensuring cross-platform stability.
- Managed multithreaded data synchronization (send/receive) for real-time cloud-service state.
- Implemented REST API endpoints for cloud synchronization within existing software architecture.
- Supported Qt 5 to 6 migration, refactoring legacy code for improved cloud-based data compatibility.
- Developed interactive UI components and application logic using event-driven signals and slots.

Software Engineer Intern

August 2022 – May 2023

- 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)

IT Support Staff — Electoral IT Systems

Botoșani, RO

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.

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) [🔗](#)

CORE SPECIALTIES

ML Core: Deep Learning, NLP, NumPy, Pandas, scikit-learn, Model Optimization

AI Systems: LLMs, RAG, Vector Search, Agentic Systems, Prompt Engineering

Software: Python, C++17/20, Qt, SQL, PyTorch, TensorFlow, Docker, CI/CD, Oracle Cloud

EDUCATION

Gheorghe Asachi Technical University of Iași

Master of Science in Artificial Intelligence

Iași, RO

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

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

PROJECTS

M.Sc. Thesis: SSM for Motion Generation (Research) 2026
Implementing S4 and Mamba architectures for temporal consistency in text-to-motion (KIT-ML dataset). Integrated physics constraints (ground contact) to resolve jitter and improve long-range dependencies.

Intelligent IDS: SQL Injection Detection 2026
Developed an IDS pipeline with Snort and Python-based Random Forest classifiers. Evaluated performance across latency (<5ms per request), false-positive rates, and cold-start learning overhead.

HandSense: NPU Gesture Recognition 2025
End-to-end YOLOv5n deployment for real-time gesture recognition (HaGRID dataset). Optimized for NPU/CPU using TFLite INT8 quantization and CLAHE/temporal smoothing for environmental robustness.

PharmaRAG: Local LLM Assistant 2025
Local RAG system using FAISS vector embeddings and Mistral-7B for medication retrieval. Implemented chain-of-thought prompting for drug interaction analysis and contraindication alerts via LLM chat.

HeuristicOpt: Optimization Framework 2025
Python framework implementing Genetic, Evolutionary, and Stochastic solvers for complex constraint satisfaction. Optimized for convergence speed and solution quality in large-scale search spaces.

WiDS: fMRI Brain-Age Prediction (8th National) 2025
ML pipeline for neuroimaging age prediction. Engineered spectral features and developed an ensemble model (XGBoost/LightGBM) to achieve a top-ranking score in the national datathon.

VOLUNTEER EXPERIENCE

LOCAL BEST Group Iași Iași, RO
IT Department Coordinator Sep 2023 – Aug 2024

- 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

- 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

- 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

- 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