Costin-Alexandru Deonise

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Maxxtra
Alex Deonise
Google Scholar

EDUCATION

University of Oxford, Mathematical Institute — May 2025 – Aug 2025
Oxford Machine Learning School — Oxford, UK

- **GPA: 9.77/10** - placed in the top **0.1%**.
- Selected with a **scholarship** as one of the **304 participants worldwide** in an intensive program organized by **University of Oxford** and **AI for Global Goals**, focused on **Advanced Machine Learning**, **Generative AI** and **AI Safety**.
- **Relevant Coursework**: MLx Fundamentals, Generative AI (**Agents, Alignment, Products**), Health & Bio, Representation Learning.

University POLITEHNICA of Bucharest, Faculty of Automatic Control and Computers — Oct 2024 – Jun 2026
Parallel and Distributed Computer Systems Master's Degree — Bucharest, RO

- **GPA: 9.92/10**; **Skills**: **C/C++, Python**, Docker, Haskell; **Admission Exam Average**: **10/10**;
- **Relevant Coursework**: Parallel Programming, Computer and Network Security, Introduction to Big Data.
- **Best Scientific Paper Award (Engineering) - Stochastic Taylor Derivative Estimator for High-Order Differential Operators 2**
- **Most Impactful Paper Award (Engineering) - Stochastic Taylor Derivative Estimator for High-Order Differential Operators 2**

University POLITEHNICA of Bucharest, Faculty of Automatic Control and Computers — Oct 2020 – Jun 2024
Computer Science and Engineering Bachelor's — Bucharest, RO

- **Diploma Thesis**: Pyannote, Whisper and LM: Knights of Speaker Diarization; **Diploma Exam Average**: **10/10**;
- **GPA**: **9.44/10**; **Skills**: **C/C++, Python**, Java, JavaScript, Haskell;
- **Relevant Coursework**: Data Structures, Algorithm Design, Object-Oriented Programming, Operating Systems, Distributed Algorithms.

WORK EXPERIENCE

Qflex technologies — Aug 2026 – Present
Chief Technology Officer — Bucharest, RO

- Lead the technical strategy and delivery of custom AI solutions for enterprise clients, from AI audits and system architecture to production-ready implementations.
- Design AI-driven systems for document understanding, knowledge retrieval, intelligent device configuration, and reliability testing using fault-injection and resilience frameworks.

Research Institute — Sep 2024 – Aug 2026
Artificial Intelligence Engineer — Bucharest, RO

- Improved **entity-centric information extraction** by developing **LLM-based knowledge graph pipelines** with **LLaMA**, structured prompting, **NER**, relation extraction, and custom datasets for transforming unstructured text into structured representations.
- Enabled **domain-specific question answering and semantic search** by building **RAG pipelines** with **embeddings**, document chunking, vector retrieval, and LLM-based answer generation for applied AI research systems.
- Automated **natural language to structured query generation** by combining **LLMs**, prompt engineering, entity normalization, date extraction, and rule-based postprocessing to convert user requests into executable search queries.
- Improved **Romanian and multilingual information extraction** by extending **spaCy-based NLP pipelines** with custom entity labels, regex-based extraction, data cleaning, and evaluation workflows.
- Supported **local AI deployment and system integration** by packaging and integrating **Python**, **Docker**, model inference pipelines, preprocessing/postprocessing modules, and backend components for production-oriented research applications.

Bitdefender — Jul 2023 – Sep 2024
Junior Machine Learning Engineer — Bucharest, RO

- **Processed 49k+** sales calls and increased review throughput **3× (from 40 to 120 calls/day)** by developing a production pipeline with **Speaker Diarization, STT** and automated sentiment & speaker tagging; this automation **brought manual** QA effort down from **120h/month to 5h/month**.
- Developed a Reddit **scraper** and **LLM-driven pipeline** (**Ada embeddings**, **K-means**, **summarization**) that extracted and clustered **7k product feedback snippets**, improving classification precision from **70% to 97%** and generating **weekly summaries** for Product and Sales prioritization.

Research Institute Jun 2023 – Sep 2023
Artificial Intelligence Engineer Intern Bucharest, RO

- Built a **modular audio processing toolkit** (VAD, STT, diarization), reducing audio-processing time per file by **35%** and enabling scalable transcription.
- Automated segmentation and transcription for **10k+ audio segments** using **Pyannote**, **Whisper** and **Pandas**, improving diarization accuracy to **92%** and producing structured outputs for downstream ML pipelines.

Research Institute Jun 2022 – Sep 2022
Artificial Intelligence Engineer Intern Bucharest, RO

- Designed and benchmarked an **AI evaluation framework** across **1M+ audio clips** and **4 state-of-the-art VAD systems**, establishing reproducible precision and recall benchmarks.
- **Built** a custom **CRDNN model** that achieved **99.8%** detection **accuracy**, surpassing **SOTA baselines** by **1.4%**, providing a reproducible performance benchmark for speech segmentation pipelines.

University POLITEHNICA of Bucharest Feb 2022 – Present
Associate Lecturer, Industry Expert Bucharest, RO

- Led discussion sections and labs for **1000+ students** across courses in **Mathematical Modeling**, **Computer Programming**, **Programming Paradigms**, **Parallel and Distributed Algorithms**, **Communication Protocols** and **Numerical Methods;**
- Assisted the course instructor with **grading**, including planning and evaluating **homework**, quizzes and **lab reports**.

Orion Innovation Oct 2021 – Jan 2022
Software Engineer Intern Bucharest, RO

- Engineered scalable **server-side** and **UI full-stack** applications using **Vue.js, Spring-Java, Hibernate** and **Java 8 / ES6**, integrating responsive UIs and efficient **REST APIs**.
- **Decreased** average debugging time from **7 to 2 days (71%)** by introducing **distributed execution patterns** (Bulk Synchronous Parallel, MapReduce) and **modernizing deployment** through **containerized microservices** with **Cloud SQL** back-ends.

OLYMPIAD LEADERSHIP & ACADEMIC SERVICE

- **National Team Coach, Romanian Delegation**, **International Olympiad in Artificial Intelligence (IOAI)** – trained and prepared Romania's national team through technical workshops and competition-focused sessions on **LLMs, NLP, embeddings, model evaluation and adversarial ML**; the delegation achieved **8/8 medals (3 Gold, 2 Silver, 3 Bronze)** and placed **4th worldwide** at **IOAI 2026** (2026)
- **Peer Reviewer**, **Endoscopy International Open** – reviewed submitted scientific manuscripts and provided peer-review feedback (2026)
- **Organizing Committee Member**, **National Team Selection for the International Artificial Intelligence Olympiad** – participated in testing **5+ qualification problems**, ensuring correctness and appropriate difficulty calibration for international-level selection rounds (2025, 2026)
- **Scientific Committee Member**, **National Artificial Intelligence Olympiad** – developed **AI tasks and judging criteria** for national-level competition rounds (2025, 2026)
- **Scientific Committee Member**, **National Cybersecurity Olympiad** – defined **evaluation standards** and designed **3 competition tasks**, supporting consistent and fair scoring (2025, 2026)
- **Scientific Committee Member**, **National Olympiad of Applied Informatics (AcadNet)** – contributed to the proposal and selection of **30+ algorithmic problems**, defining evaluation criteria and scoring rubrics (2025, 2026)
- **Trainer & Organizer**, **Machine Learning Summer Program (MLSP)**, POLITEHNICA Bucharest – contributed to student selection, research-project design, mentor matching and technical training over **3 editions**; in 2026, selected **50 students from 144 applicants**, with **13 advancing to mentored research projects** (2024–2026)
- **Mentor**, **Nitro NLP Hackathon** – mentored **45 NLP teams**, guiding model fine-tuning and evaluation pipelines (2025)
- **Reviewer**, **Romanian Education Network** – reviewed and provided feedback on **Machine Learning research papers** (2024, 2025)

PUBLICATIONS

- **Speaker-attributed meeting transcription refinement with constrained open-weight language models**
  Costin-Alexandru Deonise, TM Coconu, Muhammad Bajwa, Cătălin Negru, BC Mocanu, Aniello Castiglione, Florin Pop
  Future Generation Computer Systems (Elsevier), Jun. 2026.
- **Homomorphic Encryption for Privacy-Preserving Machine Learning Inference**
  Costin-Alexandru Deonise, AM Roanghesi, LI Gheorghe, E Simion, BC Mocanu, D Turcanu, Florin Pop
  Annals of the Academy of Romanian Scientists, Series on Science and Technology and Information, Vol. 18, No. 2, 2025.

- **Parallel and Distributed Computation of High-Order Derivatives in Neural Networks using Stochastic Taylor Derivative Estimator**
  Costin-Alexandru Deonise, J Kołodziej, Florin Pop
  2025 24th RoEduNet Conference: Networking in Education and Research, 2025.
- **Stochastic Taylor Derivative Estimator for High-Order Differential Operators**
  Costin-Alexandru Deonise, Florin Pop
  UPB Students' Scientific Communications Session (SCSS 2025). Best Scientific Paper & Most Impactful Paper, 2025.
- **Microphone Speaker Analysis: Audio Segmentation and Frequency Insights**
  TM Coconu, **Costin-Alexandru Deonise**, C Anghel, C Negru, Florin Pop
  Annals of the Academy of Romanian Scientists, 2024.
- **Improved Speech Activity Detection Model Using Convolutional Neural Networks**
  Costin-Alexandru Deonise, TM Coconu, T Rebedea, Florin Pop
  2023 22nd RoEduNet Conference: Networking in Education and Research, 2023.

PROJECTS

FIRST Robotics Competition (FRC) - Ankara & Başkent Regionals, Turkey April 2026

- Mentored Team AlphaZ in its rookie FRC season, contributing to the technical development that supported the team's qualification for the **FIRST World Championship in Houston, USA**, highlighted by the **Rookie All-Star Award** at the **Ankara Regional** and the **Quality Award** at the **Başkent Regional**.
- Developed a **ballistic targeting system** for turret control, computing shooting parameters using projectile motion equations and dynamic distance estimation, achieving **<5% targeting error** in real-time scenarios.
- Implemented **autonomous routines** enabling real-time detection, alignment and firing, reducing manual intervention by **100%** during match operation.
- Trained and deployed a **computer vision model** (e.g., YOLO-based) for real-time object detection, achieving **90% precision** and enabling stable target tracking under dynamic conditions.

AtlasRAG - Multimodal Retrieval-Augmented Reasoning System Aug 2025

- Reached **94.1% factual consistency** and **45% reduction in hallucination rate** compared to **GPT-5** baseline by building a **multimodal RAG framework** that fuses **LLaMA 3.2-70B** and **Mistral-v0.3** models with **Neo4j** knowledge-graph grounding and **hybrid FAISS/BM25 retrieval**.
- Boosted **cross-modal retrieval precision to 88%** by enabling **text-image-audio input fusion** using **CLIP-ViT** and **Whisper embeddings**, unified through a **LangGraph agentic planner** for reasoning-driven task decomposition.
- Lowered end-to-end latency by **61%** (p95 = 1.3 s) via **LoRA fine-tuning** on 25k domain samples, 4-bit **GGUF quantization** and asynchronous **vector-store caching**; all components deployed in a **containerized inference mesh** with memory persistence and adaptive batching.

Stochastic Taylor Derivative Estimator for High-Order Differential Operators 2 May 2025

- Enabled scalable high-order automatic differentiation by implementing a **multi-GPU** version of the **Stochastic Taylor Derivative Estimator (STDE)** in **JAX**, leveraging **Taylor-mode AD**, randomized jet sampling and **pjit/pmap** primitives for cross-GPU parallelism.
- Realized a **6.86× runtime speedup** and **27% lower GPU memory footprint** across 4×V100 GPUs by parallelizing jet-level contractions and minimizing inter-device synchronization through sharded batch distribution.
- Validated framework on high-dimensional **many-body Schrödinger PDEs**, sustaining numerical precision to machine epsilon and demonstrating near-linear strong scaling; results published and awarded **Best Scientific Paper** and **Most Impactful Paper (Engineering)**.

Anti Money Laundering Detection Mar 2024

- Accomplished **95% precision** and **96% recall** on **32M+** transactions by training a **5-layer sparse autoencoder** (BatchNorm, Dropout) with **MSE + L1 sparsity** and **AUCPR-optimized thresholding** on a time-split validation set.
- Reduced false positives by **18%** and improved convergence by **42%** via **timestamp normalization**, **cyclical LR (OneCycle)** under Adam and **feature store** standardization (**Feast**) for consistent offline/online features.
- Cut inference latency from **3.2s** to **0.8s** per transaction by deploying **TensorFlow Serving** behind **Kubernetes** HPA with **Kafka** streaming ingress, **TFRecords** batching and **GPU-backed autoscaling** (p95 < 900ms).

ACHIEVEMENTS & AWARDS

Best Student Awards

- **Adobe Systems Romania Scholarship** - awarded for outstanding academic achievements, research contributions and involvement in national Olympiads in **AI**, **AcadNet** and **Cybersecurity** - 2026
- **Most Impactful Scientific Paper Award - Engineering Domain, POLITEHNICA Bucharest** - awarded for outstanding research contribution and impact - 2025
- **Best Scientific Master's Paper Award - Engineering Domain, POLITEHNICA Bucharest** - awarded for the best research paper - 2025
- **"Teodor Ceausu" Scholarship for Excellence in Research and Technological Development** - awarded to top master's and PhD students for outstanding research performance - 2025
- **Student Scientific Communication Session**:
  - **Services and Applications in Large-Scale Distributed Systems**: **Second Place** - 2026;
  - **Distributed Algorithms**: **First Place** - 2025;
  - **Cloud/Fog/Edge Applications and Systems**: **First Place** - 2023; **Second Place** - 2024;

Selected International Programs

* **Selected participant** at **Oxford Machine Learning Summer School**, London & Oxford, England - 2024, 2025
* **Qualified** at **The Machine Learning Summer School**, Okinawa, Japan - 2024
* **Selected participant** at **East European Machine Learning Summer School** (**Google DeepMind**), Košice, Slovakia - 2023

International Conference Volunteering

* **International Conference on Computer Vision (ICCV)**, Paris, France - 2023
* **Conference on Neural Information Processing Systems (NeurIPS)**, New Orleans, US - 2023

Competition Achievements

* **International Cybersecurity & AI Hackathon**: **Third Place**, developed an AI-based multi-agent Crisis Decision - 2026
* **Nitro Language Processing Hackathon**: Top **8% National** - 2023
* **LiRo Machine-Learning Romanian NLP Hackathon**: **First Place National** - 2022
* **AWS DeepRacer Hackathon**: **Qualified for National Stage**, Top **4.8% National** - 2022
* **Google Hash Code**: Top **5% Worldwide** - 2022
* **ACM International Collegiate Programming Contest**: Qualified for **Regional Stage**, Top **37%** - 2020, 2021
* **Google Kick Start**: Top **40% Worldwide** - 2021
* **Bloomberg BPuzzled**: Top **5% National** - 2021
* **National Mathematics Olympiad**: Top **41% National** - 2017

Robotics Leadership & Mentoring

* **Lead Mentor, AlphaZ FRC Team #11141**: mentored a rookie **FIRST Robotics Competition** team, contributing to software development, robot strategy, outreach and public relations - 2026
* **2026 FIRST Championship**: received **Rookie All-Star Award** at the **Daly Division** - Houston, US - 2026
* **FIRST Robotics Competition Awards**: **Rookie All-Star Award** at the Ankara Regional and **Quality Award** at the Başkent Regional - 2026