



Valentin-Dimitrie Popescu

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ABOUT ME

As a proactive second year Master's student in Artificial Intelligence and Signal Processing in Electronics and Telecommunications at the Technical University of Cluj-Napoca, I have cultivated strong competencies in software development, machine learning, and digital signal processing.

I have developed strong skills in software application development. Through academic assignments, competitive events, and industry experience, I've gained invaluable knowledge in diverse aspects of the field. I have tackled complex projects, refining my problem-solving and analytical skills while also improving my adaptability and creativity in challenging environments.

My professional experience, including internships, has provided me with a practical understanding of software development, team dynamics, and project management methodologies. Additionally, I've delved into research on neural networks, deepening my comprehension of advanced machine learning techniques.

Collectively, these experiences have molded me into a competent software developer ready to tackle the ever-changing challenges in the technology landscape.

EDUCATION AND TRAINING

30/09/2019 – 30/06/2023 Cluj, Romania

BACHELOR'S DEGREE IN ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY
SPECIALIZATION: TELECOMMUNICATIONS TECHNOLOGIES AND SYSTEMS Faculty of Electronics, Telecommunications and Information Technology

01/10/2019 – 30/06/2022 Cluj-Napoca, Romania

CERTIFICATE OF COMPLETION OF THE PSYCHO-PEDAGOGICAL TRAINING PROGRAM – LEVEL I Technical University of Cluj-Napoca

01/10/2024 – 16/07/2026 Cluj, Romania

MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE AND SIGNAL PROCESSING IN ELECTRONICS AND TELECOMMUNICATIONS Faculty of Electronics, Telecommunications and Information Technology

01/10/2024 – CURRENT Cluj, Romania

CERTIFICATE OF COMPLETION OF THE PSYCHO-PEDAGOGICAL TRAINING PROGRAM – LEVEL II Technical University of Cluj-Napoca

LANGUAGE SKILLS

Mother tongue(s): **ROMANIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1
GERMAN	B1	B1	B1	B1	B1

● WORK EXPERIENCE

INTELLIGENCE AUTOMATION DEVELOPER – SC EMERSON SRL – 09/12/2025 – Current – CLUJ-NAPOCA, ROMANIA

Design, develop, and maintain **intelligent automation solutions** to streamline internal business and engineering processes within the **Professional Tools** department.

Analyze operational workflows and requirements; translate business needs into **automation use cases**, technical specifications, and implementation plans.

Implement end-to-end automations including **process orchestration, system integrations, and data-driven decision logic**, ensuring reliability and traceability.

Build and support internal tools, scripts, and services that improve **productivity, quality, and standardization** across teams.

Integrate automations with enterprise platforms (e.g., APIs, databases, ticketing/ERP systems) and ensure secure handling of data and access.

Monitor automation performance, troubleshoot incidents, and perform root-cause analysis; deliver fixes and continuous improvements.

Produce technical documentation (solution design, runbooks, user guides) and support knowledge transfer to stakeholders and users.

Collaborate with cross-functional teams (IT, engineering, operations) and provide technical guidance on automation best practices.

Contribute to coding standards, version control practices, and CI/CD or release processes to ensure maintainable deployments.

Participate in testing activities (unit/integration/regression), validation, and post-deployment support to ensure stable production operation.

TEACHING ASSOCIATE – SPEECH SIGNAL PROCESSING – TECHNICAL UNIVERSITY OF CLUJ-NAPOCA – 02/03/2026 – 26/06/2026 – CLUJ-NAPOCA

Taught project activities for the **Speech Signal Processing / Prelucrarea Semnalului Vocal** course within the **Department of Communications**, Faculty of Electronics, Telecommunications and Information Technology, Technical University of Cluj-Napoca. Supported students in understanding and applying speech signal processing concepts, guided them during project implementation, and provided feedback on technical work, documentation, and results

SOFTWARE ENGINEER – SC NANOLABS ELECTRONICS – 01/04/2022 – 17/11/2025 – CLUJ-NAPOCA, ROMANIA

Business or Sector: Professional, scientific and technical activities

As a Software Engineer, I handle a wide range of technologies and responsibilities. I maintain and enhance a large-scale project that involves working with the CoT military protocol, ensuring its reliability and efficiency. Additionally, I have developed my own Android mobile application, which is now listed on Google Play, showcasing my ability to design, develop, and deploy mobile solutions.

My work also includes writing embedded drivers and functionalities, which requires a deep understanding of hardware-software interactions and performance optimization. I develop and maintain database utilities, ensuring data integrity, security, and efficient access patterns.

I am actively involved in web server debugging and fixing, addressing both back-end issues and web interface workers. This role demands a strong understanding of web technologies, security protocols, and feature implementation to deliver robust and user-friendly web applications.

Throughout my career, I have honed my skills in incident management, risk mitigation, and problem-solving. My experience with technologies like ReactJS and MongoDB, combined with my new skill set, enables me to tackle diverse technological challenges effectively. My journey from a full-stack web developer to a proficient software engineer has equipped me with a comprehensive understanding of product life-cycles, client expectations, and the importance of robust program security.

● PUBLICATIONS

[Hybrid 1D-2D Deep CRNN Ensemble with Feature Selection for Cross-Corpus Robust Speech Emotion Recognition](#)

This work introduces a hybrid speech emotion recognition framework that combines a one-dimensional Convolutional Recurrent Neural Network (CRNN) operating on hand-crafted acoustic feature sequences with a two-dimensional CRNN processing compact spectro-temporal feature maps. Both branches rely on exhaustive feature-subset selection and a shared data-augmentation pipeline including additive noise, tempo and pitch perturbations, and vocal tract

length perturbation. The predictions of these two networks are fused through majority voting with confidence-based tie-breaking. Using standardized EmoBox splits for the Ryerson Audio-Visual Database of Emotional Speech and Song (RAVDESS) and the Surrey Audio-Visual Expressed Emotion (SAVEE) speech corpora, the 2D model surpasses several recent CNN and CNN-Transformer approaches, while the hybrid ensemble achieves 91.67% accuracy on clean RAVDESS, 89.81% with augmentation, and 80.44% in a cross-corpus RAVDESS + SAVEE setup. Results demonstrate the complementarity of 1D prosodic modeling and 2D spectro-temporal analysis, the effectiveness of exhaustive feature selection, and the critical role of systematic augmentation in enhancing robustness under realistic noisy environments and cross-corpus conditions.

Project acknowledgement: The published paper includes an acknowledgement of the “Romanian Hub for Artificial Intelligence – HRIA” project.

DOI: 10.1109/AQTR70159.2026.11577794

Authors: V.-D. Popescu, M. Giurgiu | **Journal Name:** IEEE International Conference on Automation, Quality and Testing, Robotics — AQTR 2026 | **Publisher:** IEEE

End-to-End TinyML Vibration Sensing: Quantized ResCNN on STM32L4 with SD-Card Logging and Secure LoRaWAN

Write here the descriptionThis paper presents a deployable TinyML vibration-sensing node for on-device classification of surface-borne vibration events using a fully quantized 1D Residual Convolutional Neural Network on an STM32L4 microcontroller. The system combines low-noise acceleration sensing, local SD-card logging, secure LoRaWAN communication, and model lifecycle management, achieving high classification accuracy with low-current embedded operation suitable for mission-critical monitoring scenarios.

Project acknowledgement: The published paper includes an acknowledgement of the “Romanian Hub for Artificial Intelligence – HRIA” project.

DOI: 10.1109/CSPA68262.2026.11517778

Authors: V.-D. Popescu, M. Giurgiu, J. Harrell | **Journal Name:** 2026 22nd IEEE International Colloquium on Signal Processing & Its Applications (CSPA) | **Publisher:** IEEE

Development of AI-Based Microdrone Capabilities for Multifunctional Aerial Applications

Write here the descriptionThis paper presents the design, implementation, and experimental evaluation of an AI-based multi-microdrone system for multifunctional aerial applications. The proposed architecture integrates ultra-wideband communication, onboard artificial intelligence for object detection, real-time video surveillance, autonomous navigation, indoor positioning using Time Difference of Arrival, optical flow-based stability, and a web-based control interface for coordinated microdrone operation in GPS-denied environments.

Project acknowledgement: The published paper includes an acknowledgement of the “Romanian Hub for Artificial Intelligence – HRIA” project.

DOI: 10.1109/TELFOR67910.2025.11314275

Authors: V.-D. Popescu, M. Giurgiu, M. Cserei | **Journal Name:** 2025 33rd Telecommunications Forum (TELFOR) | **Publisher:** IEEE

Optimizing Speech Emotion Recognition with Attention-Driven Deep CRNN

This paper introduces a Deep Neural Network architecture for Speech Emotion Recognition based on exhaustive acoustic feature selection and an improved Convolutional Recurrent Neural Network with attention mechanisms. Using the RAVDESS dataset, the study applies data augmentation, additional network layers, and regularization techniques to improve robustness and classification accuracy, particularly under noisy conditions.

Project acknowledgement: The published paper includes an acknowledgement of the “Romanian Hub for Artificial Intelligence – HRIA” project.

DOI: 10.1109/TELFOR67910.2025.11314307

Authors: V.-D. Popescu, M. Giurgiu | **Journal Name:** 2025 33rd Telecommunications Forum (TELFOR) | **Publisher:** IEEE

Experimental Study of Delta Neural Architectures for Low-Power Embedded Speech Enhancement

This paper studies compact delta neural architectures for low-power embedded speech enhancement under strict edge-deployment constraints. The work evaluates causal log-Mel-domain enhancement models using VoiceBank+DEMAND and shows that loss-function design improves objective quality without changing the network

topology. Based on these results, the paper derives a deployable configuration with 183k parameters, approximately 18 MMAC/s, low latency, and compatibility with INT8 quantization and ONNX-based embedded toolchains.

Project acknowledgement: The published paper includes an acknowledgement of the “Romanian Hub for Artificial Intelligence – HRIA” project.

Indexing pending

Authors: V.-D. Popescu, M. Giurgiu | **Journal Name:** 23rd International Conference on Informatics and Information Technologies (CIIT 2026)

Dynamic Semantic Routing and KV-Cache Optimization for Resource-Efficient AI Voice Assistants

The integration of Retrieval-Augmented Generation (RAG) into full-duplex, audio-native AI assistants introduces significant challenges related to latency and context retention, particularly when deployed on resource-constrained environments. Conventional monolithic architectures incur substantial computational overhead when reconstructing prompts with dynamically retrieved external knowledge, resulting in frequent key and value cache resets, increased prefill latency, and degraded real-time interaction. This paper presents a new modular hybrid edge-computing architecture designed to enable low-latency, context-aware voice interaction under a 12 GB memory constraint. The proposed system employs a semantic routing mechanism, combining Whisper for speech transcription and all-MiniLM-L6-v2 for intent representation, to classify user requests and selectively invoke web-based retrieval only when external knowledge is required. This approach minimizes unnecessary RAG operations while preserving efficient parallel hardware utilization for the PersonaPlex 7B audio-generative model. Another key contribution of this work is the empirical investigation of KV-cache prefill overhead and its impact on continuous conversational streaming. To mitigate the context disruption introduced by RAG, the proposed architecture incorporates a heuristic memory interception strategy together with forced-token prompt engineering, reducing context-reset effects following retrieval events. The system is evaluated using Time-to-First-Audio (TTFA) protocol and routing behavior analysis. Experimental results demonstrate that the proposed architecture achieves low-latency conversational interaction while providing selective, context-aware retrieval augmentation through semantic routing, making it suitable for deployment on resource-constrained edge platforms.

Accepted for publication

Authors: Cristian Butica, Valentin Popescu, Mircea Giurgiu | **Journal Name:** InnoComp 2026 | **Publisher:** Springer CCIS

● **SKILLS**

Git | Agentic AI | LLM | Azure Foundry | Deep Learning (Tensorflow, Pytorch(basic), Jax/Flax(basic)) | Linux | MATLAB (Entry) | React JS | Java | MySQL, MongoDB | C, C++ | Visual Studio Code | Android Studio | Docker - Nivel medio | Python (obspy, keras) | Web design and web development

● **DRIVING LICENCE**

Driving Licence: A

Driving Licence: B

● **HOBBIES AND INTERESTS**

Hunting

In 2021, I obtained a permit for hunting, a sport instilled in me from my upbringing, teaching me about the responsibility, ethical practices, and conservation associated with it. Hunting has fostered in me a deep respect for nature, discipline, and understanding of local regulations. It provides opportunities for personal growth and a connection with the outdoors, enhancing my understanding of ecosystem balance. As I continue this pursuit, I aim to uphold ethical hunting practices, promote conservation, and responsibly share my passion with others.

Piano

Since age 9, I've nurtured a lifelong fascination with the piano, dedicating regular time each week to practice and broaden my musical knowledge. The piano has become a means of personal expression and a way to connect through music. Consistent practice across various genres has enhanced my technical skills and deepened my appreciation for piano playing. This commitment has instilled discipline, patience, and the pursuit of excellence in me. I look forward to continuing my musical journey, collaborating with others, and sharing the joy of music.