europass



Dragoș Costin

Email address: dragos.costin@student.upt.ro |

WORK EXPERIENCE

RESEARCH ASSISTANT 3 IN DATA SCIENCE – POLITEHNICA UNIVERSITY TIMIȘOARA – 01/10/2026 – Current – TIMIȘOARA, ROMANIA

Subproject "Percepție, Procesare Inteligentă și Comunicații – inovație în lanțul valorilor cu Universitatea Politehnica Timișoara, Nr.8.PI/I4/C9"

- Analysis, research and development for automotive RADAR systems. Performance measurements of Small Language Models (SLMs) for in-cabin applicabilities and developing an optimized speech pipeline, both in the automotive sector.
- Generated data or created data being processed using Big Data technologies.

ELECTRICAL ENGINEER – CONTINENTAL AUTOMOTIVE PRODUCTS S.R.L – 25/07/2022 – 08/05/2024 – TIMISOARA, ROMANIA

- maintenance of computers, electrical equipments mounted on the production lines.
- providing necessary information for upgrades while they were in the development phase (this implying working with external sources from multiple foreign countries).
- troubleshooting in both electrical and automation fields
  - by adhering to the electrical drawings
  - observing real-time behaviors shown by the softwares respective to their PLCs (SIEMENS and BECKHOFF)
- coordinating the technicians.
- relations with suppliers.

EDUCATION AND TRAINING

28/09/2026 – CURRENT Timisoara, Romania

PHD STUDENT - DOCTORAL STUDIES IN ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES Politehnica University of Timisoara

- Researching and engineering offline, privacy-first Edge AI conversational architectures deployed directly on edge-compute hardware (ARM64 / embedded GPUs).
- Investigating end-to-end multi-modal voice processing pipelines (VAD, ASR, SLMs, TTS) with focus on zero-copy unified memory access (UMA) and kernel execution on Tensor/CUDA cores.
- Profiling data flow bottlenecks and memory consumption to minimize Time-To-First-Audio (TTFA) latency and optimize real-time token generation throughput.
- Benchmarking quantization strategies (FP16, INT8, INT4) and model compression for low-power edge deployment without accuracy degradation.

Website https://upt.ro | **Field of study** Inginerie Electronică, Telecomunicații și Tehnologii Informaționale (Domain: Edge AI) |

Thesis Sisteme Conversaționale EdgeAI

23/09/2024 – 02/07/2026 Timisoara, Romania

MASTERS DEGREE IN AUTOMOTIVE EMBEDDED SOFTWARE Politehnica University of Timisoara

Understanding how a Microcontroller Unit (MCU) works by understanding their core functionalities at its low-level. This allowed for comparing two architectures (8-bit and 32-bit ARM processors) by testing their volatility and instruction capabilities.
Created a project with a miniature car being driven by light and controlled via the keyboard.
Mastered the theoretical automotive concepts via CAN-standard, CAN-extended, CAN-FD, LIN, and created several projects via Vector CANoe.
Understanding management in software engineering projects.
Learned about academic ethics and integrity, being useful for redacting the thesis and scientific paper.
Consolidated my knowledge on Real-Time Systems on my own MCU (STM32U5 series, 32-bit ARM Cortex-M33 processor).
The dissertation thesis consists in successfully implementing a five-stage process in local voice control using an ARM64 embedded platform, namely NVIDIA Jetson Orin NX.

- State-of-the-art tools were used for the five-stage process (Wake Word Detection, Voice Activity Detection, Automatic Speech Recognition, Small Language Model, Text-to-Speech)
- Performed two implementations with HTTP and native execution on CUDA Cores (Automatic Speech Recognition) and Tensor Cores (Small Language Model)
- Reduced the Time To First Audio by 40% by adhering to the native GPU implementation.
- Further optimizing latency times, extending hardware control capabilities, implementing memory retention, and automatically determining the user's preferences using the Small Language Model.

Website https://upt.ro | **Field of study** Electronics and automation |

Final grade Overall Average Grade: 9.40/10 ; Thesis Defense: 9.80/10 | **Type of credits** ECTS | **Number of credits** 120 |

Thesis Hybrid Voice Architecture on Edge-Computing Devices and External Hardware Control

28/09/2020 – 26/06/2024 Timisoara, Romania

BACHELORS DEGREE IN ELECTRICAL ENGINEERING Politehnica University of Timisoara

Understanding how to work with electrical equipment, measurement tools, and embedded hardware.
Learned about baseline concepts: circuit theory, systems theory, electrostatics, electrokinetics, magnetism and electromagnetism.
Learned how to create and interpret electrical and electronical drawings.
Understanding how to dimension the parameters of electrical equipments.
Electrical Machines, converters and industrial automation were the main emphasis.
The bachelors thesis aims to replace variable resistors (rheostats) by using eight power resistors in parallel, controlled via embedded systems.
The main computation was realized by a Microcontroller Unit (MCU), Microchip's PIC18F47Q10. To measure electrical characteristics in real-time, STPM32 by STMicroelectronics was used. The communication is done with SPI (Serial Peripheral Interface).
The electronic schematic in KiCAD v8 is found in the link.

Website https://upt.ro | **Field of study** Electricity and energy |

Final grade Overall Average Grade: 7.44/10 ; Thesis Defense: 8.50/10 | **Type of credits** ECTS | **Number of credits** 240 |

Thesis Electronic load for laboratory use with stepper control technique

Link https://uptro29158-my.sharepoint.com/:f:/g/personal/dragos_costin_student_upt_ro/EtP1yuE4nLNBkT2moz4WVwcB-3fjwMBuaKFfZyJolm3VHQ?e=L65rmb

PROJECTS

11/05/2026 – 29/06/2026

Scientific Paper - Edge Voice Assistants on Jetson Orin NX: Analysis of Microservices and Zero-Copy Inference

The scientific paper is based on my master's dissertation thesis, focusing on the differences between HTTP POST requests and direct GPU integration, making use of the Unified Memory Architecture (UMA). The core focus of the paper is to compare the latencies extracted for all the processes, with the total improvement time being 40%.

The paper also focuses on how software-side changes explain the versatility and fastness of other frameworks and approaches.
The main challenge was featured in a separate section.

Link https://uptro29158-my.sharepoint.com/:b:/g/personal/dragos_costin_student_upt_ro/IQDnxRZxALYHQpLdMJi6qXY7AaMN_Sf-KhnE1_td3VKiW8A?e=Cpv8bZ

03/05/2026 – CURRENT
Birthdays Tracker

Alongside the dissertation, the following project is a fully-fledged, local-first, accessibility-first birthdays tracker for iOS. It uses a minimalist design, featuring cards to store the friends images, notes section, and the app properly informs the user about upcoming birthdays. The app will make its inception on the Apple App Store starting as early as November 3rd, 2026.

10/06/2025 – 22/06/2025
Miniature Car Control using a Solar Panel and UART

Paired a small, 3V3 DC-Machine to a miniature solar panel and used the solar panel to drive the motor. An H-Bridge was also used for allowing the car to go in reverse. The control and telemetry reading was performed by a Microcontroller Unit (MCU), STM32U5 series, by STMicroelectronics.
The solar panel has analog reading capabilities, and it was interfaced with the MCU using an Analog to Digital Converter (ADC), thus extracting its voltage it captures.
The car is controlled via both artificial and sunlight.
The project demonstration is in the link below.

Link https://uptro29158-my.sharepoint.com/:f:/g/personal/dragos_costin_student_upt_ro/IgCwWwsY7pCRR7EQSHnbQOMUATyuFGaMTBbAqu8wMfi-0P0?e=7o5NeY

07/01/2024 – 15/01/2024
Jam Factory Industrial Simulation

Simulated a production line showing the complete process of a jam can passing through its assembly processes. The simulation was made possible by using software by SIEMENS. The core mechanics were written in Structured Control Language (SCL) in STEP7 V17, and the view on the Human Machine Interface (HMI) was done in WinCC V17.
The project features sequence diagrams, use case diagrams and class diagrams. The Model-View-Controller (MVC) pattern has been written in C++.
The complete process has a total of 6 steps.
The project can be found in the link below.

Link https://uptro29158-my.sharepoint.com/:f:/g/personal/dragos_costin_student_upt_ro/ElktqN7fqkJLoHpCQW1R-YEB8DeBkYoy0vHHHABha6F03g?e=YVvEmf

11/10/2022 – 04/01/2023
Electrical Drawing and Dimensioning for Several Equipments

The project consists in powering up three Induction Machines, each of which starts using different procedures (DOL (Direct-On-Line), Star-Delta technique, SS (soft starter)). The other two pieces of equipment are: a three-phase socket and an induction oven.
A PDF file with the electrical drawings can be found in the link below.

Link https://uptro29158-my.sharepoint.com/:b:/g/personal/dragos_costin_student_upt_ro/IQCcgbVVVsuzT7LxPZUsheNXAfnYTyi_kze15uo5x5n78yI?e=PtlbQp

12/11/2020 – 03/12/2020
Joystick servo control

I have designed the project in such way that I made use of two servomotors and one joystick shift.
When the joystick shift was actioned in any direction, the motors would rotate opposite of each other, only one at a time, both synchronized, depending on the case
Effectively controlling each scenario with the given movement of the joystick.

07/02/2020 – 24/02/2020

5 LED's lighting up independently depending on the finger raised

In 2025 this project is the most popular because of its introduction to many people on ComputerVision 2 (CV2)
The project consists of a set-up with 5 LED's, each LED having each of their anodes connected in series with a resistor, and Mediapipe by Google was used alongside Python with CV2.
Using the hand tracking feature powered by Mediapipe, each finger was mapped with a corresponding LED. Depending on the detection of each finger, the corresponding LED would be lit up.

SKILLS

Local Voice Control

Wake Word Detection | Automatic Speech Recognition | Voice Activity Detection | Language Models | Text to Speech

Hardware Architectures

Arm32 - Arm64 Build | RISC architecture | SİEMENS S7 1200

Hardware-Bound Tools and Frameworks

AI platforms(PyTorch, Tensorflow, TensorRT, ONNX Runtime) | PyAudio | PySerial | Whisper | Llama | ALSA

Electrical Design and Component Dimensioning

EPLAN | KiCad | SIEMENS SIZER

Automation Software

SIEMENS STEP7 | SIEMENS WinCC | SIEMENS STARTDRIVE

General Usage

Swift | SwiftUI | Python | C / Embedded C | MATLAB | Git

LANGUAGE SKILLS

Mother tongue(s): **ROMANIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C2
FRENCH	A2	A2	A1	A1	A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user