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RESEARCH AND DEVELOPMENT EXPERIENCE

2013 – present

Petroleum-Gas University of Ploiesti (UPG), Romania - Associate Professor

*Department of Computer Science, Information Technology, Mathematics and Physics (iTIMF)
Director (and co-founder) of CerTIMF Research Center*

- didactic activities (lectures, laboratories, projects, theses);
- supervising research & development graduation theses, Bachelor & Master (75+, since 2012) ;
- elaboration of instructional support materials (both traditional and electronic);
- member in theses examination committees for Computer Science programs (2020-present);
- active member of the team that maintains the Computer Science study programs in UPG (undergraduate - 3 years, master - 2 years); updating curricula and syllabuses; member of the commission that monitors and provide for maintaining accreditation;
- coordinator of the Embedded Systems Laboratory (2017-present);
- scientific research and development activities; research dissemination in scientific papers and books; collaboration with local industry partners:

Main projects:

1. zDrones – developing a real-time portable embedded system for detecting drones (unmanned aerial systems) that is based on radio frequency signal interception and analysis using machine learning algorithms, in order to classify different radio signals and identify drone types and threat levels – collaboration with TehnoPro Engineering srl;
2. zGreen – automatic system for monitoring&control indoor farming of fresh produce/microgreens;
3. PBR3/20/200 – closed photobioreactors for controlling and automation of algae/spirulina cultivation - collaboration with Tehnopro Engineering srl and ICDEAPA (Research and Development Institute for Aquatic Ecology, Fisheries and Aquaculture - Galati);
4. zThermo – development of a non-contact thermal measurement embedded system for human body temperature measurement based on mid-infrared thermal camera sensor with integrated deep neural network for video processing and black body reference temperature compensation in real-time;
5. Discord infoAI community server and bot for student-teacher community; we created our own Discord server and enhanced it by creating our own special bot, to facilitate and integrate different aspects of the online teaching and learning (homework management, class schedules, attendance monitoring, question-answer sessions, video calls, semester exams, etc.). Submitting their final theses (with all the related documents and software applications) has been made easy for them via this bot, which provided also for a straightforward examination performed by the members of the graduation committee.
6. HyRok – development of the first Romanian hybrid rocket engine with power modulation – project STAR ROSA (Romanian Space Agency) SPECH: Research, design, development and bench testing of a hybrid reactive propulsion system for space launcher applications area, with innovative inhomogeneous fuel and adaptive electrical control of parameters; the main outcomes of this work are both the final experimental test bench and the hybrid rocket engine itself (with full start-stop-restart and throttling capabilities, i.e., variable power output);
7. VizTop, VizNet, 3D DIY-printer, IntelSec, MonTemp, WeldMon, Localo, Aemy, StepMonitor, TIMF-library, gipix-eCall etc. - details: <https://timf.upg-ploiesti.ro/www/proiecte/>
 - scientific and education community support activities: peer-reviewing papers & books, member of program committees/editorial boards for conferences/scientific journals; developing instructional support software tools; member of teams that organize scientific and student events; participating in contest and examination committees for teaching and research positions, member of doctoral support committees, maintaining our department's IT&C infrastructure, administrating our department library, etc.
 - contributing to evolution of our InfoUPG community both in real-world and on our extended Discord-based educational platform;
 - local (UPG) administrator for the RoEduNet academic and research network.

- 2017 – present **reachAI, London, UK**
co-founder & software architect, designer and developer
 Democratization of Sports Analytics with AI/Deep Learning on Edge devices: intensive use of deep learning for different aspects in sport analytics for football, horse racing, snookers.
- 2015 – 2016 **Elettra Communications SA, Ploiesti, Romania,**
subsidiary of Leonardo/Finmeccanica SpA, Italy
IT consultant for the NATO Alliance Ground Surveillance (AGS) program
 Project: Wide Band Data Link subsystem for AGS; offered a line-of-sight broadband, bidirectional data link between the AGS airborne platform (Global Hawk drone) and the ground-based parts.
- 2012 – 2013 **Petroleum-Gas University of Ploiesti (UPG), Romania – Assistant Professor**
Department of Information Technology, Mathematics and Physics (TIMF)
- didactic activities (lectures, laboratories, projects, theses);
 - supervising research & development graduation theses;
 - scientific research and development activities; research dissemination in scientific papers and books; collaboration with local industry partners;
 - scientific and education community support activities;
- 2005 – 2012 **ZealSoft srl, Bucharest, Romania – IT&C manager**
researcher, architect, designer and developer for software and hardware solutions
 Main projects:
1. ePH – framework for building of a dynamic user community that shares public interest information & knowledge accessible through always-on, context-aware services;
 2. Unde.ro (“unde” means “where” in Romanian): the site was a geospatial search engine for Romania. Based on the Google Maps API, it added new map tiles and address searching for the Romanian region. It contained a GIS database for address-based search. A specialized web-crawler was developed for finding in the Romanian web space different addresses or points of interest (see touristic, accommodation, gas stations, pharmacies, hospitals etc. within a given distance – was available online, free). Here geo-referencing included <http://www.unde.ro>;
 3. GiPiX is a GPS/GSM based Automatic Vehicle Location (AVL) system. It was meant to be both a personal and fleet management system for mobile device location over the Internet. The project involved the design and development, both hardware and software, of a GPS/GSM mobile tracking device, a communication protocol and back-end server, a database back-end and a GUI interface. Hardware development included full design of the embedded device, from schematics, PCB layout design, prototype production, assembly, testing. Different CAE/CAM tools were used. Software development included microcontroller programming in C (Microchip), embedded communication module programming in Python (Telit) or C (Microchip), communication protocol implementation, both on the embedded device, and on the communication server using C/C++ and Linux, database design (MySQL, noSQL Redis), and a web interface for user presentation JS/Ajax/PHP (<http://gipix.unde.ro> , <http://www.unde.ro>);
 4. IHS (Intelligent House Solution), which was intended to be an integrated solution for automatic control of house/small office processes, HVAC;
 5. fID (fIDelity) – research project on the development of a loyalty program system for a travel agency using mobile and RFID technologies; included the implementation in a POS-like embedded Linux and development of a communication protocol over GPRS and Internet;
 6. NECLib2 – a full digital library that contains various media objects that represents 18000 classical music CDs (many of these being very rare) from a private collection, donated to New Europe College (NEC). Programed in MySQL, PHP, Javascript, AJAX, and C++/Linux (<http://library2.nec.ro>);
 7. Gaccs – a multi-level TCP/IP-based control access system, which enables an authority to control access to areas and resources in a given physical facility, based on credentials. Hardware development included full design of the embedded device, from schematics, PCB layout design, prototype production, assembly, testing, by using various CAE/CAM tools. Software development included microcontroller programming in C (Microchip), implementation of a TCP/IP communication protocol, both on the embedded device and on the communication server using C/C++ and Linux, database design, and a web interface for user presentation, using html, JavaScript, AJAX; support for RFID proximity;
 8. zxChip – a project for developing a car engine ECU piggyback device for advanced race-tuning purposes with selectable running mode and realtime monitoring and logging capabilities. Hardware development included full design of the embedded device, from schematics to final product. Software development included Microchip microcontroller programming in C with USB support and Microsoft Windows .NET C++ application for configuring and monitoring the device;

9. zXPkH – a project for developing a hardware driver for peak and hold injectors used in race cars;
10. RFC tester – a project that had Siemens AG as beneficiary, it aimed to model and develop a test platform for one of the RFC protocol drafts. The software developed was an implementation of the QoS NSLP, which is a NSIS (Next Steps in Signaling) Signaling Layer Protocol for signaling QoS reservations (eg. bandwidth, delay, etc.). It was programmed in C/C++ for Linux, with a web-based real time monitoring user interface made with PHP & JavaScript /AJAX.

2009 – 2010

Petroleum-Gas University of Ploiesti (UPG), Romania – Managing Editor*UPG University of Ploiesti Scientific Bulletin, Mathematics-Informatics-Physics Series (BMIF)*

Main contributions: architecture and development of the journal's online peer reviewing and publishing system (<http://bmif.unde.ro>), peer-reviewing, international database indexing, increasing ranking from C to B+

1999 – 2004

Norwegian University of Science and Technology (NTNU), Trondheim, Norway*research fellow, Department of Computer and Information Sciences (IDI)*

Main projects:

1. Main designer and developer of the QADPZ system, an open source system for desktop grid computing, which enables users of a local network or Internet to share resources. QADPZ allows a centralized management and use of the computational resources of idle computers from a network of desktop computers. QADPZ users can submit compute-intensive applications to the system, which are then automatically scheduled for execution. The scheduling is performed according to the hardware and software requirements of the application. Users can later monitor and control the execution of the applications. Each application consists of one or more tasks. Applications can be independent, when the composing tasks do not require any interaction, or parallel, when the tasks communicate with each other during the computation. It was developed in C/C++, with support for multiple operating systems (Linux, Win, MacOS, Unix), multiple users, compression, and encryption. A subset of the Message Passing Interface (MPI) was implemented on top of QADPZ, allowing execution of already written programs, which use MPI, in a similar parallel environment. The system was installed on more than 80 computers from IDI's labs and on IDI's Beowulf cluster, and was used for computationally intensive research projects around the world, <http://qadpz.sourceforge.net/>;
2. Chief architect of the department's Beowulf cluster of 40 PCs used for research projects (ClustIS). Responsible for ordering, installation, configuration and maintenance of the cluster. It is running the Source Mage GNU/Linux operating system, a source based Linux distribution, where each of the installed software is compiled from source, with optimizations for the hardware platform, <http://ClustIS.idi.ntnu.no>;
3. Member of the Computational Science and Engineering (CSE) project at NTNU university. This was an interdisciplinary, interdepartmental research project, with collaboration between different research groups in Engineering, Computer Science and Mathematics from NTNU and the research organization SINTEF. There was a strong emphasis on high performance computing and numerical methods for problems in the marine fluid mechanics domain, using Finite Elements Methods (FEM), supercomputers and clusters for the numerical simulations;
4. Member in the 3D Virtual Reality CAVE project (Cave automated visual environment), a five wall, full-immersive virtual reality environment for 3D visualization;
 - Student volunteer involved in organizing over 14 large scientific conferences (SIGGRAPH, IEEE Visualization, IEEE Virtual Reality, Supercomputing, International Conference on Case Based Reasoning - ICCBR), from USA, Japan, and Norway.

1992 - 1997

“Politehnica” University of București (UPB), București, Romania*Computer Science and Engineering Department (CSE)*

Main projects:

1. JScm – a compiler for the Scheme functional language, able to generate byte code for the Java VM; the project consisted in converting a Scheme program into the continuation passing style (CPS), then generating an equivalent low level Java assembly language program for the Java virtual machine, which was then compiled to Java byte code, using a Java assembler;
2. Unix Vision – an OO text-mode user interface for Linux. The project consisted in porting the Turbo Vision user interface (developed for DOS) to a Unix-style environment, and involved reprogramming the low level terminal device interface in C and assembler;
3. Ada2C++ – an Ada to C++ translator for Unix; the project consisted in a lexical and a syntactical analyzer for a subset of the Ada language, for the purpose of automated translation into C++;
4. IP stack for the Thix OS – implementation of the basic IP protocol stack for the Thix Operating System, an UNIX-like operating system developed in the CSE department.

TEACHING EXPERIENCE

2013 – present	Petroleum-Gas University of Ploiesti (UPG), Romania – Associate Professor <i>Department of Computer Science, Information Technology, Mathematics and Physics (iTIMF)</i>
2012 – 2013	Petroleum-Gas University of Ploiesti (UPG), Romania – Assistant Professor <i>Department of Information Technology, Mathematics and Physics (TIMF)</i>
2009 – 2012	Petroleum-Gas University of Ploiesti (UPG), Romania – Visiting Assistant Professor <i>Department of Information Technology, Mathematics and Physics (TIMF)</i>
1999 – 2003	Norwegian University of Science and Technology (NTNU), Trondheim, Norway <i>Department of Computer and Information Sciences (IDI) – Teaching Assistant</i>
1997 – 1998	“Politehnica” University of Bucharest (UPB), Bucharest, Romania <i>Computer Science and Engineering Department (CSE) – Teaching Assistant</i>

INDUSTRIAL EXPERIENCE

1998 – 1999	OmegaSoft srl, Bucharest, Romania
2004 – 2012	<i>architect, designer and developer for software & hardware solutions, Linux OS administrator</i> Main projects: <ul style="list-style-type: none"> • Tourneo – an on-line reservation system for hotels in Bucharest and many other cities in Romania. It had implemented the on-line payment with credit card, using the novel Visa/Mastercard 3D Secure system. The work was done in cooperation with Romcard, Romania’s leading provider for card payment systems. It was one of the first three web sites in Romania accepting on-line credit card payments using this system (http://www.tourneo.ro); • ZCENT – a very low-cost GSM-based call center with typical capabilities(welcome message, call waiting/recording/forwarding, conference. The system used commercial off-the-shelf (COTS) phone terminals, connected to a PC using an original, custom-made switching board. The software was written in C++ for Windows with a web interface for configuration and monitoring; • ZPOS/wPOS – a Point of Sale POS & back-office management system for fast food restaurants. It was a network based system, that allowed working both from Intranet and Internet and, also, multi-input (PDA, touch screen etc.). It worked both on Linux and Windows operating systems, allowing a flexible deployment. The PocketPC module allowed also to work from wireless points. Programmed in a combination of AJAX, PHP and C/C++ (WindowsCE), with a MySQL backend; • Linux servers – administration, performance monitoring and tuning; extensive use of advanced Internet protocols (BGP, VPN, SMTP, SNMP, etc.); development and deployment of monitoring tools; advanced MySQL database management and performance tuning.
1998 – 2012	New Europe College, București, Romania <i>developer of IT&C solutions</i> <ul style="list-style-type: none"> • NECLIB: a web based on-line library catalogue, developed in collaboration with ZealSoft srl; • automation solutions of the existing IT&C infrastructure for easier management&monitoring.
1998 – 1999	ZealSoft srl, Bucharest, Romania <i>software developer</i> <ul style="list-style-type: none"> • NECLIB2: a full digital library that contains various media objects that represents 18000 classical music CDs (many of these being very rare) from a private collection that have been donated to NEC. Programed in MySQL, PHP, Javascript, AJAX, and C++/Linux (http://library2.nec.ro); • NECLIB: a web based on-line library catalogue firstly developed for The New Europe College (NEC). The system allows the readers to do complex searches, including free text, very efficiently for books in the catalogue, and helps the librarian to keep track of the users and loans. Programed in Perl and MySQL for Linux (http://library.nec.ro); • INTLIB: project for interconnecting all deployments of the same program at other similar institutions (such as New Europe College, The Center for Independent Journalism, The Institute for Art History, The University of Arts), allowing distributed search in different catalogues; • SIDER: an innovative (for 1998-year) Internet search engine meant for the Romanian web-space that was a distributed system and was developed using modern object-oriented software engineering methods (RUP, UML). It was programmed in C++, Perl, and MySQL for Linux.

- 1997 – 1998 **SOFOS SpA, Roma, Italia**
software developer
- Worked in a team on the ViaSat project. ViaSat was a real-time distributed vehicle security system using GPS positioning. It was developed in collaboration with Com.Net, SpA, subsidiary of Telespazio, Italy. The system was functional in Italy and Austria. I was involved in all aspects of software development, including analysis, design, developing, testing and documentation of the GPS position correction subsystem and the central communication subsystem. Developed in C/C++ for Windows NT, with TCP/IP for communication.
- 1997 – 1999 **Arexim SA, Bucharest, Romania**
software developer
- Internet consultant, Internet Service Provider (ISP) Department. Main designer of the hardware infrastructure configuration, multiple Linux servers deployment, and development of monitoring software. The ISP department was providing Internet access for a couple of hundreds external clients over leased lines and dial-up.
- 1996 – 1997 **Bit Soft srl, Bucharest, Romania**
project manager, software developer
- Worked in a team with WTT (World Travel and Tourism), a Romanian travel agency, on the first Internet based on-line reservation system for hotels in Bucharest and other cities in Romania;
 - Developer of the MAESTRO multi-platform accounting software system (Windows, MacOS), based on the 4D RDBMS; involved in all stages of the development;
 - Worked in a team on the SITEL project. SITEL was the most used hotel front-end system in Romania. Involved in development of software interfaces with different other systems (pay-tv, telephone switching systems, etc.), Internet communication infrastructure design, implementation and maintenance using Linux PCs.
- 1994 – 1995 **AnziSoft srl, Bucharest, Romania**
software developer
- FAST project, an application for product stock management of pharmaceutical companies; a database application written in FoxPro for DOS, with support for Novell/Netware networks. for the required performance, sophisticated use of the SQL language was necessary.

EDUCATION

- 1999 – 2004 **Norwegian University of Science and Technology (NTNU), Trondheim, Norway**
Department of Computer and Information Sciences (IDI)
 2008 – *PhD in Computer and Information Science*
 “A Desktop Grid Computing Approach for Scientific Computing and Visualization”
- 1992 – 1997 **“Politehnica” University of București (UPB), București, Romania**
Computer Science and Engineering Department (CSE)
 1997 – *MSc. in Computer Science and Engineering*
 “Scheme Compiler for the Java Virtual Machine”

PROFESSIONAL AND PERSONAL SKILLS

- Skills
- 35+ years of extensive work experience in various aspects of computer software analysis, design, development and testing (since 1988);
 - 30+ years of experience with the Linux operating system at different levels, from installation, kernel hacking to high-level programming (since 1993);
 - 30+ years of experience with the Internet (high/low level network protocols) (since 1993);
 - 20+ years of experience with digital hardware and embedded systems design and development, both at hardware and software levels (since 2005);
 - Theoretical and practical knowledge of software engineering, operating systems, object-oriented methodologies, compilers, parallel and distributed systems, real-time systems, artificial intelligence, deep neural networks, embedded systems;
 - Able to optimize programs, to use difficult algorithms and protocol specifications;
 - Programming languages: C/C++, Perl, JavaScript, Kotlin, Java, Python, PHP, Pascal;
 - Parallel/distributed programming: MPI, OpenMP, PVM, Corba, Orca, Linda;
 - Functional languages: Scheme, ML, Lisp;
 - Databases: MySQL, PostgreSQL, Redis, MS SQL, Oracle, SQLite, FoxPro, dBase;
 - Operating Systems: Linux, Windows, Android, eCOS, DOS, SunOS, Ultrix, CPM;
 - Schematic layout and PCB design: CadSoft Eagle, KiCad;

- Microcontroller experience: STM32, Microchip PIC, Espressif ESP32, Atmel Atmega;
 - PLC automation: Wago, Beckhoff;
 - CAD and Simulation software: Ansys, Solidworks;
 - Embedded Linux systems, RaspberryPi, OrangePi;
 - 3D printing systems;
 - Autonomous embedded robots;
 - Communication protocols: RS232, SPI, I2C, CAN, USB, WiFi, BT, BLE, ZigBee, EtherCAT;
 - GSM modules experience: Siemens/Cinterion, Telit, Simcom, Quectel;
 - GPS modules experience: SiRF StarII/III/IV; uBlox; Quectel;
 - RFID experience: 125kHz, 13.56MHz, 900Mhz;
 - Very good theoretical and practical knowledge of computer networks: Internet (TCP/IP), Novell (IPX/SPX), Windows (NetBEUI, SMB);
 - Excellent mathematics background and very good analytical skills;
 - Self-management, self-motivated, task-oriented, efficient and quick learner, imaginative, innovative & critical thinking, communication, initiative, determination, patience, problem-solving, working well under stress, able to work in a team environment or unsupervised.
- Volunteer experiences
- Student volunteer for the following conferences: SIGGRAPH (2000, 2001), Supercomputing (2001), IEEE Visualization (2000, 2001, 2002), IEEE Virtual Reality (2001), ROSE(1994, 1995), ICCBR (2003), PARA (2008), CSGSC NTNU Computer Science Graduate Student Conf. (2001,2002,2003)
- Memberships
- INSTICC (Institute for Systems and Technologies of Information, Control and Communication) from 2009,
 - ACM (Association of Computing Machinery) from 1999-2010,
 - IEEE Computer Society from 1999-2010,
 - National Geographic Society, PMI (Project Management Institute) 2000-2012.
- Languages
- Romanian, English, Hungarian, French, Italian, Norwegian
- Awards
- National Mathematics Contest, Hungary, 1990 – Second prize
 - National Mathematics Contest, Romania, 1986 – First prize
- Other
- Publications list, references available upon request or further details at <http://www.unde.ro/zoran>