

CURRICULUM VITAE

Personal data

Name Ștefan-Adrian TOMA
Phone
Email
Date of birth
Driving license BE and CE

Education

2005 – 2011 PhD Degree

Thesis title: *Methods for increasing speech synthesis quality*

Advisor: *prof. Oancea Eugeniu*

Military Technical Academy, Romania.

2005 – 2007 Master Degree in Radio communications, Microwaves and Optical communications

Thesis title: *Study on subjective codec evaluation for communication systems*

Advisor: *prof. Ion Marghescu*

“Politehnica” University of Bucharest, Romania.

1999 – 2004 Bachelor’s (Dipl. Eng.) degree

Thesis title: *Implementation of a MIMO-Channel-sounder for parameter acquisition in Multipath Indoor Radio Channels*

Advisors: *A. Knopp and prof. B. Lankl from Bundeswehr University, Muenchen, Germany*

Military Technical Academy, Bucharest, Romania.

1999 Baccalaureate, Mathematics-Physics

1994 – 1999 Alexandru Ioan Cuza' High-School (Bucharest, Romania).

Work experience

December 2010 onwards: Research engineer at Terrasigna (formerly Advanced Studies and Research Center S.R.L.)

Projects and tasks:

- development of software for the efficient phase unwrapping of InSAR images using triangulation and optimization algorithms (programming in C/C++ and Matlab);
- PSInSAR processing of satellite acquired SAR images using gamma and StaMPS (gamma, bash, Python, Matlab);
- TerraFirma certification project;
- detection of deformation profile types using signal processing techniques and machine learning (Python, Keras, Tensorflow, Matlab);
- PSTool application (concept, backend design and implementation using PostgreSQL, MapProxy, GeoServer);
- setup, testing and upgrading of permanent scatterers interferometry package StaMPS (scripts for the automation of the processing chain and some C and Matlab programming);

- setup and testing of ROI_PAC processing chain for along-track interferometry (scripts for the automation of the processing chain and some C and Matlab programming);
- other programming tasks (Matlab, Python and C);
- development of signal processing algorithms and radar systems.
- grant proposal writing
- project management.

September 2008 onwards: Associate professor at the Military Technical Academy “Ferdinand I”

Courses: *Digital signal processing* (digital signal processing algorithms, Fourier transform, digital filters, digital and analog modulations, signal generators etc); *Digital signal processors* (audio processing and communications algorithms, C programming on Analog Devices MSA and TI C6000 family (baremetal)); *Biometric systems* (speaker recognition, speech modelling), *Programming languages* (C & Matlab).

Research interest: radar systems, synthetic aperture radar (SAR), SAR interferometry, digital signal processing, machine learning, speech and natural language processing.

Research projects: 3 national grants and 1 MoD project as project manager; 6 international projects as research team member; 1 industry (private) funded project as research team member; other national and international projects as research team member.

Publications: PhD thesis, 2 books, laboratory notes, 5 journal papers and 25 conference papers.

ORCID:

S14Ro – Service for nation-wide infrastructure monitoring (2020 - 2022) – research grant project manager, contract 64PTE/2020.

The goal of the project is the development of a nationwide infrastructure monitoring service, automate the PSInSAR processing chain and develop PSTool as a web application for presenting to users deformation maps and results from Persistent Scatterers (PS) time-series analysis and post-processing (seasonal variations detection, sudden changes in the deformation trend etc.).

My contributions were:

- Concept, grant proposal writing
- PSTool backend design and implementation (GeoServer, PostgreSQL, MapProxy)
- Development of signal processing algorithms for deformation profile analysis (Matlab)
- Development of machine learning applications for deformation profile analysis (Python, sklearn, keras)
- PSTool application specifications writing, and testing

PSTool - Persistent Scatterers Time-Series Analysis and Post-processing Tool with Application to Infrastructure Threat Detection (2017 - 2019) – research grant project manager, contract 126/2017, ROSA.

The PSTool project proposes a new and innovative solution for Persistent Scatterers (PS) time-series analysis and post-processing by developing state-of-art algorithms for the automatic analysis of deformation profiles of a Persistent Scatterer Interferometry (PSI) processing, together with identification of non-linear deformation models characteristic to pre-collapsing infrastructure.

My contributions were:

- Concept, grant proposal writing
- Deformation profile statistical modelling (Matlab)
- Deformation profile analysis using machine learning (Matlab, Python)
- PSTool application specifications writing and testing

Heimdallr - Key word spotting for real time surveillance in telephone conversations in Romanian (2017 -2018) – research grant project manager, contract PED229/2017.

The goal of the project was the development of a key word spotting system for real time surveillance in telephone conversations in Romanian. The project comes in the context of homeland security, i.e. the fight against organized crime and terrorism. The project starts from a proof of concept (TRL3) keyword spotting system (KWS) based on HMM acoustic models and improves in it by adding new acoustic models based in neural networks and near real-time capabilities.

My contributions were:

- Concept, grant proposal writing
- Near real time experimental infrastructure development (GSM Gateway, VoIP PBX configuration)
- Adaptation of the available corpora to communication network environment (design of the adaptation system, bash scripting)
- Testing KWS algorithm (Python)

October 2016 – December 2018 Engineer at Beia Consult. (part – time)

Speech recognition and natural language processing application development. (Matlab, Java, Weka, Kaldi)

July 2014 – October 2015: Research engineer – postdoctoral scholarship (Military Technical Academy). Research and development of algorithms for radar signal processing (Matlab) – postdoctoral scholarship. Thesis: *Methods for increasing range resolution in pulse compression synthetic aperture radars.*

2012 (6 months, part-time): embedded software developer for Selex Communications. My job was to test fixed-point implementations of voice coding and decoding algorithms on C6455 TI DSP (programming in embedded C for C6455 DSP using Code Composer Studio, Matlab).

September 2004 – August 2008: IT infrastructure administrator in a military unit (MoD, Romania)

Duties: implementing MoD policies regarding IT system security, planning and building computer networks, technical support for the IT infrastructure.

I was in charge of teams of sizes ranging from 2 to 7 people.

Technical Expertise

Programming languages

Excellent C, Matlab (including Simulink) programming skills.

Competent with Python, the GNU tool chain.

Competent with HTML and Javascript. I designed the COMM 2010 conference website.

Competent with LaTeX scientific document typesetting.

Assembly language for: Microchip processors (especially PIC); Analog Devices Blackfin DSPs (especially BF 533), Intel 8086.

Scripting: Python, MS-DOS batch scripting, bash.

Basic knowledge of VHDL and Verilog.

Operating systems

Linux (Ubuntu mostly) and Windows.

Applications/Tools

Tools: Electronic circuits simulation and design tools: Proteus.

IDEs for embedded software development Visual DSP++ and Code Composer Studio.

IDEs for software development Eclipse, Visual Studio, Spyder

Microsoft Office applications

Doris, gamma, StaMPS, ROIPAC and Nest InSAR processing software.

Version control with git

Training Courses

- April – June 2017 - *Distance Learning Course: Webinar Series on SAR Data Processing and Applications* organized by Working Group on Capacity Building & Data Democracy (WGCapD), Committee on Earth Observation Satellites (CEOS) during April 17 to June 05, 2017.
- September 2011 – *GEOSS Summer School – Advancing Earth Observation Data Understanding for Disaster Management and Emergency Response* – Romanian Space Agency (ROSA)
- February – June 2011 – *Advanced course on logistics for officers*, Military Technical Academy
- April 2010 *Project Management course* organized by S.C. European Project Consulting S.R.L.
- April – June 2009 *German language course* – National Defense University
- October 2006 – February 2007 – *German language course* – National Defense University
- Various courses on Coursera.

Languages

English	Speaking: Advanced, Reading: Advanced, Writing: Advanced
French	Speaking: Beginner, Reading: Beginner, Writing: Beginner
German	Speaking: Beginner, Reading: Beginner, Writing: Beginner
Romanian	Native language