



Roland Bolboaca

WORK EXPERIENCE

Assistant lecturer

"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology [2021 – Current]

City: Targu Mures | Country: Romania

Activities:

- Bachelor thesis supervision.
- University committees
- Part of the Electrical Engineering and Information Technology department with focus on courses, seminars and practical activities (P.A.) on the following disciplines (Romanian and English):
 - Programming Fundamentals - P.A.
 - Informatics + Biostatistics - **Hamburg Campus, Germany**
 - Information Systems Security - P.A.
 - Computer Systems Architecture - P.A.
 - Design of Algorithms - Course, Seminar, P.A.
 - Advanced Programming Methods - P.A.
 - Advanced Programming Techniques - P.A.
 - Scientific and Professional Writing and Communication - Seminar
 - Data Structures and Algorithms - P.A.
 - Artificial Intelligence - P.A.
- Summer University for students:
 - System Design using Arduino 2021

Software developer

Bitdefender Romania [2022 – 2023]

City: Targu Mures | Country: Romania

Research Assistant

"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology [2019 – 01/11/2023]

City: Târgu Mureș | Country: Romania

Part of **Horizon 2020 DIAS project (Smart Adaptive Remote Diagnostic Antitampering Systems)**

Main responsibilities:

- Writing scientific papers
- Research, design and implement methods, algorithms and communication protocols. Mainly focused on network security protocols and anomaly detection methods.
- Design, implement and conduct experiments to verify the validity of the developed protocols, using tools such as: CANoe/CANalyzer simulator, Matlab and integrated boards with their tool-chains.
- Integrate technologies required in experimental environments, meaning, testing and compilation of third party libraries, setting up linux environments for experiments
- Management of project wikis and code repositories, documenting the current work and maintaining the source code for the projects.

ICT application developer

Thingsmaze Solutions [2020 – 2022]

City: Targu Mures | Country: Romania

- Compiling, installing, and troubleshooting developed security solutions.
- Testing and integration of IoT equipment.
- Software development using python, SQLite, MongoDB and ZMQ.
- Collaboration in troubleshooting, integration and testing of software / hardware solutions.
- Maintenance of the code base of the GIT, SVN project

Software developer

Thingsmaze Solutions [2019 – 2020]

City: Targu Mures | Country: Romania

Part of **Horizon 2020 GHOST project (Safe-Guarding Home IoT Environments with Personalized Real-time Risk Control)**

Main responsibilities:

- Compilation, installation and debugging of the developed security solutions.
- Integrating smart home protocols into the core middleware, mainly focused on the
- Z-Wave protocol
- Smart sensor testing and behavior debugging
- Software development focused using python, SQLite, MongoDB and ZMQ
- Administrative responsibilities including hosting weekly meetings, document translations, communication with the users involved in the GHOST project.

EDUCATION AND TRAINING

PhD in Informatics

"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology [01/10/2021 – 2024]

City: Targu Mures | Country: Romania | Field(s) of study: Informatics | Thesis: Nonlinear systems modeling using machine learning techniques with applications in anomaly detection

Post-graduate Certificate Internet of Things (IoT): Applications and Opportunities

University of California, Irvine, United States [2024 – Current]

City: Irvine, California | Country: United States | Website: <https://ce.uci.edu>

Professional Course: IBM Machine Learning Professional Certificate

Coursera [2023 – 2023]

- Exploratory Data Analysis for Machine Learning
- Supervised Machine Learning: Regression
- Supervised Machine Learning: Classification
- Unsupervised Machine Learning
- Deep Learning and Reinforcement Learning
- Machine Learning Capstone

<https://coursera.org/verify/professional-cert/HCY78FWNK44B>

Professional Course: Sequences, Time Series and Prediction

Coursera [2023 – 2023]

- Time series and forecasting problems in TensorFlow
- Prepare data for time series learning using best practices
- Explore how RNNs and ConvNets can be used for predictions
- Build a sunspot prediction model using real-world data

<https://www.coursera.org/account/accomplishments/verify/4RAB2P6VGYZV>

Professional Course: An Intuitive Introduction to Probability

Coursera [2023 – 2023]

Basic, intuitive and practical introduction into Probability Theory.

Topics covered:

- Probability
- Conditional Probability
- Applications
- Random Variables
- Normal Distribution

<https://www.coursera.org/account/accomplishments/verify/TLRAB7NZX8F7>

e-Media Specialist - COR 251303

"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology [2023 – 2023]

City: Targu Mures | Country: Romania

Digital competences in the use of e-learning platforms

Psycho-pedagogical (Teacher) Course DPPD Level II

"Dimitrie Cantemir" University [2022 – 2022]

Psycho-pedagogical (Teacher) Course DPPD Level I

"Dimitrie Cantemir" University [2021 – 2021]

City: Targu Mures | Country: Romania

MSc in Information Technology

"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology [2019 – 2021]

City: Targu Mures | Country: Romania

Bachelor's degree in Informatics

"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology [2016 – 2019]

City: Targu Mures | Country: Romania

High school Diploma, Assistant Programmer

Constantin Brancusi High School [2001 – 2005]

City: Targu Mures | Country: Romania

LANGUAGE SKILLS

Mother tongue(s): Romanian

Other language(s):

English

LISTENING B2 READING B2 WRITING B2

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

Hungarian

LISTENING B1 READING B1 WRITING A2

SPOKEN PRODUCTION A2 SPOKEN INTERACTION B1

French

LISTENING A2 READING A2 WRITING A2

SPOKEN PRODUCTION A2 SPOKEN INTERACTION A2

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

DIGITAL SKILLS

Software Development

C, C++, C# / HTML, CSS, JS / Java / Visual Basic / Microsoft SQL / embedded software / Python / SQL (PostgreSQL) / OpenCV / Tensorflow, Keras, Pytorch, sklearn

Web Software Development

Frontend developer - HTML5, CSS, JS / Back-End Web Development

Software

Microsoft Office / Android Studio / MATLAB / Vector CANoe/CANalyzer / LaTeX / Visual studio / R / Simulink / Unity

Audio/Video Processing

Adobe Photoshop, Adobe Premiere / Adobe Lightroom / DaVinci Resolve

OS

Windows, macOS, Chrome OS și GNU/Linux / Embedded Systems / Embedded Applications: Arduino, MPLAB

PUBLICATIONS

[2024]

Feature Analysis and Ensemble-based Fault Detection Techniques for Nonlinear Systems Neural Computing and Applications (Springer)

Bolboaca Roland, Haller Pirooska, Genge Bela

[2024]

Network Intrusion Detection System Using Anomaly Detection Techniques International Conference on Intelligent Computer Communication and Processing ICCP 2024, Cluj, Romania

David Oroian, Roland Bolboaca, Adrian-Silviu Roman and Virgil Dobrota

Link: <https://iccp.ro/index>

[2024]

Evaluation Techniques for Long Short-Term Memory Models: Overfitting Analysis and Handling Missing Values Roland Bolboaca, Bela Genge

The 37th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems.

[2023]

Unsupervised Outlier Detection in Continuous Nonlinear Systems: Hybrid Approaches with Autoencoders and One-Class SVMs Roland Bolboaca, Bela Genge

International Conference INTER-ENG 2023 Interdisciplinarity in Engineering, Targu Mures, Romania.

[2024]

Privacy-Oriented Feature Selection for Multivariate Time Series Classification 28th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems

Adrian Roman, Bela Genge, Roland Bolboaca

Link: <http://www.kesinternational.org/2024conferences.php>

[2023]

Performance Analysis of Long Short-Term Memory Predictive Neural Networks on Time Series Data Mathematics 2023, 11 (6), 1432 (ISSN: 2227-7390, FI: 2.592, Q1), DOI: <https://doi.org/10.3390/math11061432>

Bolboaca Roland, Haller Piroska

[2022]

Adaptive Ensemble Methods for Tampering Detection in Automotive Aftertreatment Systems, IEEE Access, vol. 10, pp. 105497-105517, 2022, DOI: 10.1109/ACCESS.2022.3211387

Roland Bolboacă

[2022]

Tampering Detection for Automotive Exhaust Aftertreatment Systems using Long Short-Term Memory Predictive Networks 2022 IEEE European Symposium on Security and Privacy Workshops (EuroS&PW)

Bolboacă, R, Haller, P, Kontses, D, Papageorgiou, A, Doulgeris, S, Zingopis, N, Samaras, Z

[2021]

A Statefull Firewall and Intrusion Detection System Enforced with Secure Logging for Controller Area Network European Interdisciplinary Cybersecurity Conference, Targu Mures, Romania, 2021

Teri Lenard, Roland Bolboacă

[2020]

Locality Sensitive Hashing for Tampering Detection in Automotive Systems ARES: The 15th International Conference on Availability, Reliability and Security, 2020, Dublin, Irlanda

Roland Bolboaca, Teri Lenard, Bela Genge and Piroska Haller

[2020]

LOKI: A Lightweight Cryptographic Key Distribution Protocol for Controller Area Networks International Conference on Intelligent Computer Communication and Processing ICCP 2020, Cluj, Romania

Teri Lenard, Roland Bolboaca, Bela Genge and Piroska Haller

[2020]

MixCAN: Mixed and Backward-Compatible Data Authentication Scheme for Controller Area Networks IFIP Networking 2020 Conference (IFIP Networking 2020), Paris, Franța

Teri Lenard, Roland Bolboaca, Bela Genge and Piroska Haller

[2020]

Tampering detection for in-vehicle systems Fourth International Conference on Applied Informatics, Imagination, Creativity, Design, Development - ICDD, 2020, Sibiu, Romania.

Roland Bolboaca, Bela Genge and Piroska Haller

[2019]

Using Side-Channels to Detect Abnormal Behaviour in Industrial Control Systems International Conference on Intelligent Computer Communication and Processing ICCP 2019, Cluj, Romania

Bolboaca Roland, Genge Bela, Haller Piroska

[2019]

Detecting anomalies in Industrial Control Systems by leveraging side-channel information EMT - XXIX. SzamOkt International Conference on Computer Science 2019, Timisoara, Romania

Bolboaca Roland, Genge Bela, Haller Piroska

CONFERENCES AND SEMINARS

[2022] George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures

University committees

- **UMFST Scholarships for Scientific Performance 2022:** Reviewer member of the scholarship awarding committee
- **UMFST Scholarships for Scientific Performance 2023:** Reviewer member of the scholarship awarding committee
- **UMFST Scholarships for Scientific Performance 2024:** Reviewer member of the scholarship awarding committee
- **Commissions for the pre-admission and admission exam to the master's degree:** Committee secretary for preadmission, summer admission and fall admission.
- **Commissions for employment teaching and research positions:** Committee secretary

Link: www.umfst.ro

[2024]

Neural Computing and Applications Journal Reviewer

Link: <https://link.springer.com/journal/521>

[2024]

MethodsX Journal - Elsevier Reviewer

Link: <https://www.sciencedirect.com/journal/methodsx>

[29/11/2023 – 29/11/2023] George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures

Continental Hackathon Maze Solving Competition

- Part of the organizing Team.
- 4 Teams Mentor.

Link: <https://u2b.umfst.ro/hackathoncontinental/>

[2023] George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures

International Conference INTER-ENG 2023 Interdisciplinarity in Engineering 2023 - 2024 Reviewer

2024 Organizing Committee and Session Chair

Link: <https://inter-eng.umfst.ro/2023/>

[2023 – 2023] Targu Mures

Inov8 Mures Camp UMFST

1. Session chair:
 - a. Control Engineering and Applied Informatics
2. 2 Teams supervision:

a. AN ALGORITHM FOR AUTONOMOUS MAZE SOLVING ROBOT

Bogdan Ionela¹, Burduv Anca Delia¹, Berbecaru Andrei¹, Assistant Professor Bolboacă Roland¹

b. UMFST ELEARNING PLATFORM

Cordoş Florin¹, Szekeres Iuliana¹, Apopei Teofana¹, Părau Iulian¹, Associate Professor Gligor Adrian¹, Assistant Professor Bolboacă Roland¹

¹„George Emil Palade” University of Medicine, Pharmacy, Science, and Technology of Târgu Mureş (UMPhST)

Link: <https://inov8ing.umfst.ro/caiet-program2023-zumfst>

[2022 – 2022] George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures

International Conference of PhD Students and Young Doctors 2022 Organizing Committee.

University Days
December 5 - 9, 2022,
Targu Mures, Romania

Link: <https://zilele.umfst.ro>

[2022 - 2022] George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures
Scientific Workshop: Operations Twin in the Industrial value chain Organizer.

Invited speaker: Victor Spita,
Associate Director at Accenture Romania

Link: <https://zilele.umfst.ro/3d-flip-book/program-general-zumfst-2022/>

[2022 - 2022] Targu Mures

Inov8 Mures Camp UMFST Team Supervision:

SOLUTION FOR THE MANAGEMENT OF CAR SERVICES SPECIALIZED IN TUNING

Purenci Bogdan¹, Stoica Raul-Dan¹, Assistant Professor Bolboaca Roland¹

¹Universitatea de Medicină, Farmacie, Științe și Tehnologie „George Emil Palade” din Târgu Mureș (UMFST)
(Information Technology)

Link: <https://inov8ing.umfst.ro/caiet-program2022-zumfst>

[2021 - 2021] Targu Mures, Romania.

European Interdisciplinary Cybersecurity Conference 2021 Part of the organizing Team

Link: <https://www.fvv.um.si/eicc2021/>

HONOURS AND AWARDS

[2021] European Interdisciplinary Cybersecurity Conference

Best Paper Award Lenard, Teri, and Roland Bolboaca. "A statefull firewall and intrusion detection system enforced with secure logging for controller area network." In *European Interdisciplinary Cybersecurity Conference*, pp. 39-45. 2021.

FIELDS OF RESEARCH

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Machine learning, Artificial Intelligence, Neural Networks, Anomaly detection systems and ensembles, Outlier analysis, Fault detection, Data analysis, Prediction and forecast methods.

Nonlinear systems, Chaotic systems, Systems modeling, Simulation.

Cryptography, Security protocols, Lightweight security protocols, Data authentication, Application security.

DRIVING LICENCE

Driving Licence: B