Lefteris Tsipis

+30 6970390699 | ltsipis@aegean.gr | https://www.linkedin.com/in/lefteris-tsipis/

QUALIFICATIONS SUMMARY

I am a committed researcher, educator, and technology enthusiast with a background in Information and Communication Systems Engineering. Currently pursuing a Ph.D, I actively contribute as a researcher at the Computer and Communication Systems Laboratory (CCSL). My focus spans across various national and European projects, specializing in AI-driven aerial-terrestrial cooperative communication systems. Leveraging software-defined network, optimization theory and machine learning techniques for wireless networks is a key area of expertise. Furthermore, I have an extensive publication list in international scientific journals and have presented my work at major conferences. My dedication to advancing AI-driven communication technology aligns seamlessly with my passion for exploring innovative solutions in this rapidly evolving field.

EDUCATION

Doctor of Philosophy - PhD, Wireless Communication 2020 – 2025
University of the Aegean
Research Area: Intelligent air-to-ground communications systems | Collaborative communication systems | Wireless network optimization from a physical and radio resource management perspective | Machine Learning for wireless networks
Advisor: Prof. Vouyioukas Demosthenes

Master of Engineering 2018 – 2020
University of the Aegean | Internet of Things : Smart Environments in Next Generation Networks
Thesis: Implementation of Machine Learning techniques for the optimal placement of unmanned aerial vehicles (UAVs) and the prediction of propagation losses in mobile communication networks.
Advisor: Prof. Vouyioukas Demosthenes

Engineering Diploma 2012 – 2018
University of the Aegean | Department of Information & Communication Systems
Thesis: Interference study in Heterogenous Mobile Communication Systems
Advisor: Prof. Vouyioukas Demosthenes

PROFESIONAL EXPERIENCE

Research and Software Engineer for SCOTSS - Computer and Communication Systems Laboratory (CCSL) - University of the Aegean **01/2024 – 05/2025**

Project Description: Space-based innovation and digitalization for the school of tomorrow (SCOTSS), funded by the European Space Agency (ESA), proposes a 5G-enabled, satellite-supported educational platform, that: provides an advanced school experience to students offering access to advanced educational services; introduces space, human spaceflight and satellites as a hands-on educational topic; utilizes earth observation and satellite navigation services to implement a novel educational approach with the goal to increase student awareness on environmental issues.
Objectives:

- Managed a ground-based station using Software Defined Radio (SDR) to receive satellite imagery.
- Developed APIs to deliver satellite data to third-party applications, enabling smooth data integration and accessibility.
- Participation in the preparation of deliverables.
- Participation on deliverables-reports.

Technologies used:

- Python, Django Framework, MySQL, Docker, GitHub, software defined radio, GNU Radio

Research and Software Engineer for Degrees - Computer and Communication Systems Laboratory (CCSL) - University of the Aegean **05/2023 – 05/2024**

Project Description: Degrees, funded by the European Space Agency (ESA), is a security platform tailored for safeguarding terrestrial ground stations and satellite links in government satellite communication systems such as Greecom. It intelligently detects, reports, and triggers reconfiguration in response to cyber threats or system compromise.

Objectives:

- Responsible for analysis, designing and developing critical network functionalities such as load balancing and fail-safe reconfiguration.
- Participation in the preparation of deliverables.
- Participation on deliverables-reports.

Technologies used:

- Python, Django Framework, Open Daylight SDN Controller, Mininet, MySQL, Grafana, Docker, GitHub

Backend Software Engineer for OLTE - Computer and Communication Systems Laboratory (CCSL) - University of the Aegean **01/2020 – 05/2023**

Project Description: The OLTE project aims to develop a versatile platform functioning as an Open Art Lab. It aims to serve two primary roles: first, establishing infrastructure, and second, dynamically mining and providing diverse data for various art-related purposes

Objectives:

- Designed and developed the back end, ensuring its functionality and efficiency in alignment with project objectives.
- Conducted unit testing to ensure the robustness, reliability, and functionality of the developed software components.
- Participation in the preparation of deliverables

Technologies used:

- Python, Django Rest Framework, Multi tenant architecture (SaaS), PostgreSQL, RDF graphs, Docker, GitHub

Field Engineer for Pedion 24 - Computer and Communication Systems Laboratory (CCSL) - University of the Aegean **09/2018 – 09/2023**

Project Description: "PEDION24", (in collaboration with the mobile telephony company Cosmote) concerns the development, installation and management of a network for measuring the intensity of non-ionizing E/M radiation from base station antennas. Objectives

Objectives:

- Development, installation and management of a network for measuring the intensity of non-ionizing E / M radiation.
- Designed and developed a website to publish real-time results on a 24-hour basis, ensuring timely and accessible dissemination of information (https://pedion24.gr/).
- Execution of measurements upon request.
- Analysis of measurements and elaboration of a study on the conclusions.

Technologies - Tools used:

- SRM 3000/3006, MS Office, WordPress, PHP, Laravel Framework

TEACHING EXPERIENCE

Programming Instructor - Desknet Learning Center

Indicative course content:

- Taught core programming concepts in C++ and Java, including object-oriented programming, data structures, and algorithms, tailored to students' learning goals.
- Guided students in developing real-world coding projects, enhancing problem-solving skills and preparing them for academic and professional success.
- Prepared students for competitive programming and university exams, with many achieving excellent results and gaining admission to top institutions.

For the academic year 2024-2025

Programming Instructor - Anavasis Learning Center

Indicative course content:

- Taught core programming concepts in C++ and Java, including object-oriented programming, data structures, and algorithms, tailored to students' learning goals.
- Guided students in developing real-world coding projects, enhancing problem-solving skills and preparing them for academic and professional success.
- Prepared students for competitive programming and university exams, with many achieving excellent results and gaining admission to top institutions.

For the academic year 2024-2025

Teaching Assistant in Telecommunications - Undergraduate Program - University of the Aegean

Indicative course content:

- Taught the principles of AM, FM, and PCM modulation, including their applications in analog and digital communication systems.
- Explained signal processing techniques and demonstrated their practical implementation through hands-on exercises and simulations.
- Supervised hands-on activities, including signal generation, modulation, and analysis using industry-standard tools and equipment.

For the academic year 2019-2020, 2020-2021, 2021-2022, 2022-2023

Teaching Assistant in Wireless Communications - Undergraduate Program - University of the Aegean

Indicative course content:

- Led laboratory sessions on wireless communications, teaching practical applications of antenna design, radiation patterns, and antenna characteristics.
- Instructed students in the use of tools and software for analyzing and optimizing antenna performance in real-world scenarios.
- Evaluated lab reports and provided personalized feedback, ensuring students developed a thorough understanding of wireless communication concepts.

For the academic year 2021-2022, 2022-2023.

Teaching Assistant in Digital Communications - Undergraduate Program - University of the Aegean

Indicative course content:

- Assisted in teaching digital communication concepts, including modulation techniques such as ADC, FSK, PSK, QPSK, 16-QAM, and OFDM, using MATLAB and Simulink tools.
- Led laboratory sessions, where students implemented and simulated modulation schemes using MATLAB and Simulink, helping them visualize and analyze signal behavior.
- Provided guidance on assignments and projects, ensuring students effectively used MATLAB and Simulink for digital signal processing, simulation, and performance analysis.

For the academic year 2021-2022.

Teaching Assistant in Internet of Things - Undergraduate Program - University of the Aegean

Indicative course content:

- Assisted in teaching IoT concepts, including hands-on work with Arduino, Waspmote, LoRa, Wi-Fi, and MQTT protocols.
- Led laboratory sessions, guiding students through the design and implementation of IoT systems and networks using relevant hardware and software tools.
- Provided support and feedback on student projects, helping them integrate IoT devices and communication protocols to create functional systems.

For the academic year 2021-2022, 2022-2023.

DIGITAL SKILLS

Expert in Matlab and Simulink | Expert in C/C++ Programming for integrated environments like Arduino Waspmote | Proficient in Python for data analysis, using libraries like pandas, NumPy, and matplotlib to clean, analyze, and visualize data | Expert in Python for AI, with expertise in machine learning libraries such as scikit-learn, TensorFlow, and Keras to build and deploy predictive models | Expert in building web applications with Django, Flask, and FastAPI, to develop backend solutions | Database Management (MySQL, MS SQL Server, PostgreSQL, SQLite) |

Expert in JavaScript and React, specializing in developing dynamic, responsive, and user-friendly web applications | Expert in Linux operating systems, skilled in shell scripting, system administration, process management, and network configuration | Knowledgeable in Docker, with experience in building, managing, and deploying containers to simplify application development and deployment |Latex text editing | Microsoft Office | Operating Systems: Windows, macOS, and Linux (various distros)

Microcontroller units (MCUs): Raspberry Pi | Arduino | Waspmote | ESP32 | ESP8266 | Arduino Nano 33 IoT

Backend framework: Django (Python) | FastAPI (Python) | Flask (Python) | Laravel (PHP) | Express.js (Node.js)

Frontend framework: React.js (JavaScript)

Data analytics and machine learning platforms: KNIME (Konstanz Information Miner) | Weka | RapidMiner | Microsoft Azure Machine Learning

SEMINARS

- Udemy, Topic: PHP & MySQL Course for Absolute Beginners | Become a PHP Pro, 2020
- Udemy, Topic: "5G: Introduction for Telecom Professionals", 2020
- Udemy, Topic: Machine Learning: Making Computers Think, 2020
- Udemy, Topic: JavaScript Fundamentals, 2020
- Udemy, Topic: The Complete Node.js Developer Course, 2019
- Coursity, Topic: Introduction to Programming with Python, 2018
- Coursity, Topic: Introduction to Statistical Data Analysis (SPSS), 2019
- RapidMiner, Machine Learning Professional Certification, 2020
- RapidMiner, Machine Learning Professional Certification, 2020
- RapidMiner, Applications & Use Cases Professional Certification, 2020
- RapidMiner, Data Engineering – Professional Certification, 2020
- RapidMiner, Machine Learning Master Certification, 2022

RESEARCH INTERESTS

Communications and Networks: Cognitive Radio and Software Radio | Multiple Access Techniques | Dynamic Spectrum Usage | MIMO - Massive/Distributed/Beamspace | Ad-hoc Networks and IoT | Vehicular Communications | Waveform Design - Transmission Techniques | Physical Layer Design | Radio Channel Measurement and Modeling | Integrated Satellite-Airborne-Ground Networks B5G/6G | Machine Learning for Wireless Communication

Signal Processing: Spectrum sensing Detection and estimation theory **|** Multicarrier modulations (orthogonal, and non-orthogonal) **|** Coding

Emerging Technologies: Internet of Things (end-to-end from sensor to backend)

Information and Security: Physical Layer security | Risk analysis

PARTICIPATION IN SCIENTIFIC ORGANIZATIONS

Reviewer for international scientific journals: IEEE Transactions on Communications | IEEE Journal on Selected Areas in Communications | Springer Telecommunication Systems, IEEE Transactions on Wireless Communications | IEEE Transactions on Antennas and Propagation | IEEE Transactions on Aerospace and Electronic Systems | IEEE Access | IEEE Open Journal of the Communications Society | IEEE Antennas and Propagation Letters | IEEE Transactions on Vehicular Technologies | MDPI Sensors | MDPI Drones

Reviewer for international scientific conferences: IEEE VTC | IEEE PIMRC | IEEE CCNC |IEEE Globecom | IEEE ICC | IEEE WCNC | CAMAD

Member of Organizations/Associations:

- Member of the Institute of Electrical and Electronics Engineers (IEEE) since 2019
- Member of the Laboratory of Computer and Communication Systems Laboratory (CCSL), University of Aegean since 2018.
- Member of Telecommunication Systems Laboratory (TSL), University of Piraeus since 2024.

PUBLICATION LIST

JOURNALS

[1] **L. Tsipi**, M. Karavolos, G. Papaioannou, M. Volakaki, D. Vouyioukas, Machine learning-based methods for MCS prediction in 5G networks, Telecommunication Systems, 2024, Springer, https://doi.org/10.1007/s11235-024-01158..., indexed in SCI-E, IF = 2.5

[2] **L. Tsipi**, M. Karavolos, D. Vouyioukas, P. Bithas, Machine Learning-Based Methods for Enhancement of UAV-NOMA and D2D Cooperative Networks, Sensors, Vol. 23, No. 6, 2023, MDPI, https://doi.org/10.3390/s23063014, indexed in SCI-E, IF = 3.847

[3] **L. Tsipi**, D. Vouyioukas, G. Loumos, A. Kargas, D. Varoutas, Digital Repository as a Service (D-RaaS): Enhancing Access and Preservation of Cultural Heritage Artefacts, Heritage, Vol. 6, No. 10, pp. 6881-6900, 2023, MDPI https://doi.org/10.3390/heritage6100359, indexed in SCI-E, IF = 1.7

[4] **L. Tsipi**, M. Karavolos, D. Vouyioukas, An Unsupervised Machine Learning Approach for UAV-Aided Offloading of 5G Cellular Networks, Telecom, Vol. 3, pp. 86-102, 2022, MDPI, https://doi.org/10.3390/telecom3010005, IF = 2.1

[5] N. Moraitis, **L. Tsipi**, D. Vouyioukas, A. Gkioni, S. Louvros, On the Assessment of Ensemble Models for Propagation Loss Forecasts in Rural Environments, Wireless Communications Letters, 2022, IEEE, indexed in SCI-E, IF = 4.348

[6] N. Moraitis**, L. Tsipi**, D. Vouyioukas, A. Gkioni, S. Louvros, Performance Evaluation of Machine Learning Methods for Path Loss Prediction in Rural Environment at 3.7 GHz, Wireless Networks, Vol. 27, pp. 4169–4188, 2021, Springer, https://doi.org/10.1007/s11276-021-02682..., indexed in SCI-E, IF = 2.602

CONFERENCES

[1] M. Karavolos, N. Moraitis, **L. Tsipi**, D. Vouyioukas, Enhancing Performance in Hybrid Satellite-Terrestrial Networks: A Novel Joint NOMA-NC Approach, GLOBECOM 2024, Global Communications Conference, Dec, 2024, Cape Town, South Africa, IEEE

[2] N. Moraitis, **L. Tsipi**, D. Vouyioukas, Machine-Learning-Based Path Loss Prediction for In-Cabin Wireless Networks, ICMLCN2024, International Conference on Machine Learning for Communication and Networking, May, 2024, Stockholm, Sweden, IEEE

[3] **L. Tsipi**, V. Tatsis, D. N. Skoutas, D. Vouyioukas, C. Skianis, A Machine Learning UAV Deployment Approach for Emergency Cellular Networks, ICC 2023, International Conference on Communications, pp. 5683-5688, May, 2023, Rome, Italy, IEEE

[4] M. Karavolos, **L. Tsipi**, D. Vouyioukas, P. Bithas, P. Mathiopoulos, Satellite Aerial Terrestrial Hybrid NOMA Scheme in 6G Networks: An Unsupervised Learning Approach, 6GNet 2022, 1st International Conference on 6G Networking, Networking and Communications, Jul, 2022, Paris, France, IEEE

[5] N. Moraitis, **L. Tsipi**, D. Vouyioukas, Machine Learning-Based Methods for Path Loss Prediction in Urban Environment for LTE Networks, WiMob 2020, 16th International Conference on Wireless and Mobile Computing, Networking and Communications, Oct, 2020, Thessaloniki, Greece, IEEE