

MARIOS AVGERIS

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Research Focus: Edge, Fog & Cloud Computing | Computational Offloading | NFV/SFC Placement | Network Optimization & Management | Intent-Based Networking | Edge Robotics | IoT | Reinforcement Learning (RL) | Control Theory | 5G/6G

EDUCATION

Doctor of Philosophy (PhD) in Electrical and Computer Engineering *Athens, Greece*
National Technical University of Athens (NTUA), School of Electrical and Computer Engineering *10/2016 – 10/2021*
Thesis: “Dynamic Resource Allocation and Computational Offloading at the Network Edge for Internet of Things Applications”
Advisor: Prof. Symeon Papavassiliou
Average Grade: 9.67/10 (Excellent)

Diploma (BEng & MEng) in Electrical and Computer Engineering (Major in Computer Science) *Athens, Greece*
National Technical University of Athens (NTUA), School of Electrical and Computer Engineering *09/2011 – 10/2016*
Thesis: “Semantic Aware Management of Federated Experimental Infrastructures”
Advisor: Prof. Symeon Papavassiliou
Average Grade: 8,16/10

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow *Ottawa, ON, Canada*
Carleton University – Department of Systems and Computer Engineering *01/2022 – now*
Research Project:

- Enabling Sustainable Ultra Reliable Computing and Communications over 5G+ Wireless Technologies (NSERC)

NSERC Systems Developer *Ottawa, ON, Canada*
Ericsson – Department of Radio & Hardware Digital Design *06/2022 – now*
Product:

- Smart Radio Log Anomaly Detection

Postdoctoral Fellow *Montreal, QC, Canada*
École de Technologie Supérieure (ÉTS), Université du Québec – Department of Software and Information Technology Engineering, LASI Research Laboratory *07/2022 – now*
Research Projects:

- eDge computing ResoUrce allocatIon for Dynamic NETworks, DRUID-NET (CHIST-ERA)
- Cisco University Research Program Fund of Silicon Valley Community Foundation
- Control-Based Systems for Automated Network Assurance

Researcher *Athens, Greece*
GreenSupplyChain Digital Innovation Hub *10/2021 – 11/2021*
Research Project:

- ICT Innovation for agriculture – Digital Innovation Hubs for Agriculture (H2020)

Researcher *Athens, Greece*
Research Committee (ELKE), National Technical University of Athens (NTUA) *10/2016 – 09/2021*
Research Projects:

- Computation Offloading for IoT-enabled Applications, COMFORT-APP (part of Fed4FIREplus, H2020)
- OptiMized Edge Slice OrchestratioN, MESON (NSRF 2014–2020)
- IoT2Edge: Allocating Selected IoT Processing And Storage Activities to Edge Nodes to Optimise Performance and Resource Consumption Ensuring Interoperability (H2020)

Researcher

Research Committee (ELKE), University of Thessaly (UTH)

Volos, Greece

07/2018 – 06/2019

Research Project:

- HELIX-National Digital Infrastructures for Research, HELNET

Research Assistant

Queen's University Belfast (QUB) – Energy, Power and Intelligent Control (EPIC) Research Centre, School of Electronics, Electrical Engineering and Computer Science

Belfast, UK

12/2018 – 02/2019

Research Project:

- Industrial IoT-driven Remote Path Planning, IIoT-REPLAN (part of Fed4FIREplus, H2020)

Researcher

Institute of Communication and Computer Systems (ICCS), National Technical University of Athens (NTUA)

Athens, Greece

09/2016 – 10/2018

Research Project:

- SAMANT: Semantic Aware Management of federated Testbeds (part of RAWFIE, H2020)

REFEREED PUBLICATIONS

International Peer Reviewed Journals

- (J01) Khan, S., **Avgeris, M.**, Gascon-Samson, J., & Leivadeas, A. (2024). EMDTORA: Energy-Aware Multi-User Dependent Task Offloading and Resource Allocation in MEC using Graph-Enabled DRL. *IEEE Transactions on Green Communications and Networking*. (Under Review)
- (J02) Mohamed, R., **Avgeris, M.**, Leivadeas, A., & Lambadaris, I., (2024). Optimizing Resource Fragmentation in Virtual Network Function Placement using Deep Reinforcement Learning. *IEEE Transactions on Machine Learning in Communications and Networking*. (Under Review)
- (J03) Doan, K., **Avgeris, M.**, Leivadeas, A., Lambadaris I., & Shin WJ (2024). Cooperative Learning-Based Framework for VNF Caching and Placement Optimization over Low Earth Orbit Satellite Networks. *IEEE Transactions on Vehicular Technology*. (Under Review)
- (J04) Salah, T. B., **Avgeris, M.**, Leivadeas, A., & Lambadaris, I. (2024). VNF Placement and Dynamic NUMA node Selection through Core Consolidation at the Edge and Cloud. *IEEE Transactions on Network and Service Management*.
- (J05) Mohamed, R., **Avgeris, M.**, Leivadeas, A., Lambadaris, I., Chinneck, J., Morris, T., & Djukic, P. (2024). Service Function Chain Network Planning through Offline, Online and Infeasibility Restoration Techniques. *Computer Networks*, 110241
- (J06) **Avgeris, M.**, Spatharakis, D., Dechouniotis, D., Leivadeas, A., Karyotis, V., & Papavassiliou, S. (2022). ENERDGE: Distributed Energy-Aware Resource Allocation at the Edge. *Sensors*, 22(2), 660.
- (J07) Spatharakis, D., **Avgeris, M.**, Athanasopoulos, N., Dechouniotis, D., & Papavassiliou, S. (2022). Resource-aware Estimation and Control for Edge Robotics: a Set-based Approach. *IEEE Internet of Things Journal*, 10(3), pp.2003-2020.
- (J08) Saeik, F., **Avgeris, M.**, Spatharakis, D., Santi, N., Dechouniotis, D., Violos, J., Leivadeas, A., Athanasopoulos, N., Mitton, N., & Papavassiliou, S. (2021). Task offloading in Edge and Cloud Computing: A survey on mathematical, artificial intelligence and control theory solutions. *Computer Networks*, 195, 108177.
- (J09) Papathanail, G., Pentelas, A., Fotoglou, I., Papadimitriou, P., Katsaros, K.V., Theodorou, V., Soursos, S., Spatharakis, D., Dimolitsas, I., **Avgeris, M.**, & Dechouniotis, D. (2020). MESON: Optimized Cross-Slice Communication for Edge Computing. *IEEE Communications Magazine*, 58(10), pp.23-28.
- (J10) Kalatzis, N., Routis, G., Marinellis, Y., **Avgeris, M.**, Roussaki, I., Papavassiliou, S., & Anagnostou, M. (2019). Semantic Interoperability for IoT Platforms in Support of Decision Making: An Experiment on Early Wildfire Detection. *Sensors*, 19(3), 528.
- (J11) **Avgeris, M.**, Spatharakis, D., Dechouniotis, D., Kalatzis, N., Roussaki, I., & Papavassiliou, S. (2019). Where There Is Fire There Is SMOKE: A Scalable Edge Computing Framework for Early Fire Detection. *Sensors*, 19(3), 639.
- (J12) **Avgeris, M.**, Dechouniotis, D., Athanasopoulos, N., & Papavassiliou S., (2018). Adaptive Resource Allocation for Computation Offloading: A Control-theoretic Approach. *ACM Transactions on Internet Technology*, TOIT-2017-0161.

- (C01) Bouhoula, S., **Avgeris, M.**, Leivadreas, A., & Lambadaris, I., (2024). DRL-based Trajectory Planning and Sensor Task Scheduling for Edge Robotics. In *2024 IEEE 10th World Forum on Internet of Things (WF-IoT)*. IEEE. (Under Review)
- (C02) Mohamed, R., **Avgeris, M.**, Leivadreas, A., & Lambadaris, I., (2024). Online VNF Placement using Deep Reinforcement Learning and Reward Constrained Policy Optimization. In *2024 IEEE International Mediterranean Conference on Communications and Networking (MeditCom)*. IEEE. (Under Review)
- (C03) Mohamed, R., **Avgeris, M.**, Leivadreas, A., & Lambadaris, I., (2024, June). Fragmentation-Aware VNF Placement: A Deep Reinforcement Learning Approach. In *ICC 2024-IEEE International Conference on Communications*. IEEE.
- (C04) Doan, K., **Avgeris, M.**, Leivadreas, A., Lambadaris I., & Shin WJ, (2023, December). Service Function Chaining in LEO Satellite Networks via Multi-Agent Reinforcement Learning. In *GLOBECOM 2023-2023 IEEE Global Communications Conference*. IEEE.
- (C05) Landeau, G., **Avgeris, M.**, Leivadreas, A., & Lambadaris I., (2023, October). Security-Oriented Network Intent Placement using Particle Swarm Optimization. In *2023 7th Cyber Security in Networking Conference (CSNet)* (pp. 19-22). IEEE.
- (C06) **Avgeris, M.**, Mechennef, M., Leivadreas, A., & Lambadaris I., (2023, June). A Two-Stage Cooperative Reinforcement Learning Scheme for Energy-Aware Computational Offloading. In *2023 IEEE 24th International Conference on High Performance Switching and Routing (HPSR)* (pp. 179-184). IEEE.
- (C07) **Avgeris, M.**, Leivadreas, A., & Lambadaris I., (2023, June). Reinforcement Learning-enabled Auctions for Self-Healing in Service Function Chaining. In *2023 IEEE International Conference on Communications Workshops (ICC Workshops)* (pp. 776-781). IEEE.
- (C08) **Avgeris, M.**, Leivadreas, A., & Lambadaris I., (2023, May). A Reinforcement-Learning Self-Healing Approach for Virtual Network Function Placement. In *NOMS 2023-2023 IEEE/IFIP Network Operations and Management Symposium* (pp. 1-5). IEEE.
- (C09) **Avgeris, M.**, Leivadreas, A., Athanasopoulos, N., Lambadaris, I., & Falkner, M. (2023, May). Model Predictive Control for Automated Network Assurance in Intent-Based Networking enabled Service Function Chains. In *NOMS 2023-2023 IEEE/IFIP Network Operations and Management Symposium* (pp. 1-7). IEEE.
- (C10) Bouhoula, S., **Avgeris, M.**, Leivadreas, A., & Lambadaris I., (2022, September). Computational Offloading for the Industrial Internet of Things: A Performance Analysis. In *2022 IEEE International Mediterranean Conference on Communications and Networking (MeditCom)* (pp. 1-6). IEEE.
- (C11) Saeik, F., Violos, J., Leivadreas, A., **Avgeris, M.**, Spatharakis, D., & Dechouniotis D., (2021, September). User association and behavioral characterization during task offloading at the edge. In *2021 IEEE International Mediterranean Conference on Communications and Networking (MeditCom)* (pp. 70-75). IEEE.
- (C12) Dimolitsas I., **Avgeris, M.**, Spatharakis, D., Dechouniotis D., & Papavassiliou S., (2021, September). Enabling industrial network slicing orchestration: A collaborative edge robotics use case. In *2021 IEEE International Mediterranean Conference on Communications and Networking (MeditCom)* (pp. 215-220). IEEE.
- (C13) Spatharakis, D., **Avgeris, M.**, Kakkavas G., Papadakis-Vlachopapadopoulos K., Dimolitsas I., Dechouniotis D., Karyotis V., & Papavassiliou S., (2021, July). Industrial robotics experimentation over federated next generation internet testbeds. In *2021 IEEE International Mediterranean Conference on Communications and Networking (MeditCom)* (pp. 1-2). IEEE.
- (C14) Spatharakis, D., **Avgeris, M.**, Athanasopoulos, N., Dechouniotis, D., & Papavassiliou, S., (2020, November). A Switching Offloading Mechanism for Path Planning and Localization in Robotic Applications. In *2020 International Conferences on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData) and IEEE Congress on Cybermatics (Cybermatics)* (pp. 77-84). IEEE.
- (C15) **Avgeris, M.**, Spatharakis, D., Athanasopoulos, N., Dechouniotis, D., & Papavassiliou, S., (2019, August). Single vision-based self-localization for autonomous robotic agents. In *2019 7th International Conference on Future Internet of Things and Cloud Workshops (FiCloudW)* (pp. 123-129). IEEE.
- (C16) Karyotis, V., **Avgeris, M.**, Michaloliakos, M., Tsigkaris, K., & Papavassiliou, S. (2018, October). Utility Decisions for QoE-QoS Driven Applications in Practical Mobile Broadband Networks. In *Proc. of IEEE Global Information Infrastructure and Networking Symposium (GIIS 2018)* (pp. 1-5). IEEE.

- (C17) Kalatzis, N., **Avgeris, M.**, Dechouniotis, D., Papadakis-Vlachopapadopoulos, K., Roussaki, I., & Papavassiliou, S. (2018, June). Edge Computing in IoT ecosystems for UAV-enabled Early Fire Detection. In *2018 IEEE International Conference on Smart Computing (SMARTCOMP)* (pp. 106-114). IEEE.
- (C18) **Avgeris, M.**, Kalatzis, N., Dechouniotis, D., Roussaki, I., & Papavassiliou, S. (2017, September). Semantic Resource Management of Federated IoT Testbeds. In *International Conference on Ad-Hoc Networks and Wireless* (pp. 25-38). Springer, Cham.

Research Work In Progress

- (WIP) **Avgeris, M.**, Athanasopoulos, N., Leivadeas, A. & Lambadaris I. (2024). Safe Set Calculation in Distributed Model Predictive Control for IBN Assurance (Journal).
- (WIP) **Avgeris, M.**, *et al.* (2024). Machine Learning based Radio Anomaly Detection (Journal).

AWARDS, FELLOWSHIPS, & GRANTS

2023	CU-PSAC Postdoctoral Fellow Research Award , Carleton University	CAD \$1350
2023	Conference Travel Grant (NOMS 2023) , IEEE Communications Society	US \$500
2022	Best PhD Thesis Award “Iakovos Gkiourounlian” , Michail N. Stasinopoulos – VIOCHALCO Public Benefit Foundation	€1750
2019–2021	PhD Student Scholarship , Research Committee (ELKE) of the National Technical University of Athens (NTUA)	€7500/year
2018–2022	(5×) Scientific Publication Award , D. Thomaidis Legacy	€400/year

TEACHING EXPERIENCE

Lab Assistant

- 2017–2019 **3278: Computer Networks Laboratory**, School of Electrical and Computer Engineering, National Technical University of Athens (NTUA) – *Classes of 40*

Mentoring

- 2022–now **Assisting supervision of MSc/PhD students**, Department of Systems and Computer Engineering, Carleton University
- 2022–now **Assisting supervision of MSc/PhD students**, LASI Research Laboratory, École de Technologie Supérieure (ÉTS)
- 2016–2021 **Assisting supervision of undergraduate/MSc students**, Network Management and Optimal Design Laboratory (NETMODE), National Technical University of Athens (NTUA)

OUTREACH & PROFESSIONAL DEVELOPMENT

Editorial/Review Experience

Journal Editor

- **Frontiers** in the Internet of Things, Special Issue “Intent-Based Networking for the Internet of Things”, 2024 – *Guest Editor*
- **TSP** Computers, Materials & Continua, 2023–2024 – *Early Career Editorial Board*
- **MDPI** Electronics, Special Issue “Parallel and Distributed Cloud, Edge and Fog Computing: Latest Advances and Prospects”, 2023 – *Guest Editor*
- **Frontiers** in Communications and Networks Journal, Special Issue “Advanced Techniques for Task Placement in 5G/6G Network Infrastructures”, 2023 – *Guest Editor*

- **IEEE** Transactions on Network and Service Management, Transactions on Mobile Computing, Journal on Selected Areas in Communications, Communications Letters, Access, Internet of Things Journal | **Elsevier** Computer Networks, Pervasive and Mobile Computing, Journal of Parallel and Distributed Computing, Big Data Research, Simulation Modelling Practice and Theory, Future Generation Computer Systems, Internet of Things, Applied Soft Computing | **MDPI** Applied Sciences, Entropy, Computers, Information, Future Internet, Sensors, Robotics, Symmetry, Electronics, Network, Drones | **Springer** Cluster Computing, Journal of Network and Systems Management, Peer-to-Peer Networking and Applications, Journal of Cloud Computing, The Journal of Supercomputing, Journal of Grid Computing, SN Applied Sciences | **Wiley** Concurrency and Computation: Practice and Experience, Wireless Communications and Mobile Computing | **Taylor & Francis** Cybernetics and Systems, Automatika, Journal of Experimental and Theoretical Artificial Intelligence | **AIMS Press** Mathematical Biosciences and Engineering, Electronic Research Archive | **ITU** Journal on Future and Evolving Technologies | **TSP** Computers, Materials & Continua, Computer Systems Science and Engineering | **ORD** Operations Research and Decisions | **Inderscience** International Journal of Computer Applications in Technology
- **MDPI** Volunteer Reviewer

Professional Society Activities

Professional Memberships

- ACM Professional Member (*since 2024*)
- IEEE Member (*since 2022*)
- IEEE Communications Society Member (*since 2022*)
- IEEE Young Professionals Member (*since 2022*)

Conference Organizing Committee

- 17th International Conference on COMmunication Systems & NETworkS (COMSNETS) 2025 – Machine Intelligence in Networked Data and Systems (MINDS) – *Workshop Co-Chair*
January 6 – 10, 2024, Bangalore, India
- 16th International Conference on COMmunication Systems & NETworkS (COMSNETS) 2024 – Machine Intelligence in Networked Data and Systems (MINDS) – *Workshop Co-Chair*
January 3 – 7, 2024, Bangalore, India
- The Eighteenth International Conference on Systems and Networks Communications (ICSNC) – INMEETS: Intent-Based Networking through Machine Learning – Enabling Emerging Technologies and Services – *Special Track Chair*
November 13 – 17, 2023, Valencia, Spain
- ACM Internet Measurement Conference (IMC) 2023 – *Online Experience Co-Chair*
October 24 – 26, 2023, Montreal, QC, Canada
- IEEE HPSR 2023: International Conference on High Performance Switching and Routing – Automated and high performance Networks Through Intent-BAsed Networking Workshop (ANTIBAN) – *Workshop Organizer*
June 5 – 7, 2023, Albuquerque, NM, USA

Conference Session Chair

- IEEE HPSR 2023: International Conference on High Performance Switching and Routing, *Technical Session 5: “Terrestrial and Aerial Mobile Networks”*,
June 5 – 7, 2023, Albuquerque, NM, USA
- IEEE International Mediterranean Conference on Communications and Networking (MeditCom) 2021,
September 7 – 10, 2021, Athens, Greece
- IEEE ICCCN 2021: International Conference on Computing and Communication Networks,
July 19 – 22, 2021, Athens, Greece

Conference Program Committee

- IEEE Global Communications Conference (GLOBECOM) 2024, December 8 – 12, 2024, Cape Town, South Africa
- International Artificial Intelligence Conference (IAIC) 2024, November 8 – 10, 2024, Jinyun, Zhejiang, China
- The Nineteenth International Conference on Systems and Networks Communications (ICSNC), September 29 – October 03, 2024, Venice, Italy
- 2024 International Conference on Automation Engineering and Artificial Intelligence (ICAEAI 2024), September 21 – 22, 2024, Shanghai, China
- IEEE International Conference on Communications (ICC) 2024, June 9 – 13, 2024, Denver, CO, USA
- International Conference on Innovations in Cybersecurity and Data Science (ICICDS) 2024, March 15 – 16, 2024, Bengaluru, India
- 24th ACM/IFIP International Middleware Conference, December 11 – 15, 2023, Bologna, Italy
- IEEE Global Communications Conference (GLOBECOM) 2023, December 4 – 8, 2023, Kuala Lumpur, Malaysia
- International Artificial Intelligence Conference (IAIC) 2023, November 24 – 27, 2023, Nanjing, China
- The Eighteenth International Conference on Systems and Networks Communications (ICSNC), November 13 – 17, 2023, Valencia, Spain
- 14th International Conference on Network of the Future (NoF) 2023, October 4 – 6, 2023, Izmir, Turkey
- 24th International Conference on Distributed Computing and Networking (ICDCN) 2023, January 4 – 7, 2023, Kharagpur, India
- IEEE Global Communications Conference (GLOBECOM) 2022, December 4 – 8 2022, Rio de Janeiro, Brazil
- The Seventeenth International Conference on Systems and Networks Communications (ICSNC), October 16 – 20, 2022, Lisbon, Portugal
- IEEE International Mediterranean Conference on Communications and Networking (MeditCom) 2022, September 5 – 8, 2022, Athens, Greece
- 31st IEEE International Conference on Computer Communications and Networks (ICCCN), July 25 – 28, 2022, Virtual
- 8th IEEE International Conference on Smart Computing (SMARTCOMP), June 22 – 24, 2022, Espoo, Finland
- 9th International Conference on Cloud Computing and Services Science (CLOSER) 2019, May 2 – 4, 2019, Heraklion, Crete, Greece

Committee Service

- Three Minute Thesis (3MT®) Committee – Carleton University, 2024

CERTIFICATES

The University of Hong Kong: University Teaching (2024)

University of Glasgow: Diversity and Inclusion in Education (2024)

World Education Services: Verified International Academic Qualifications (2023)

Stanford University Department of Computer Science: Machine Learning (2017)