

Xenofon Foukas

Curriculum Vitae

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Professional Experience

- July 2024 - present - **Principal Researcher**, *Microsoft Research, Cambridge, United Kingdom.*
Working on designing and developing **an efficient and intelligent platform for the 5G/6G edge**. Technical lead on **Project Janus** for enabling real-time and flexible RAN and Platform programmability.
- Sep 2023 - present - **Principal Researcher**, *Microsoft Azure for Operators, Cambridge, United Kingdom.*
- Oct 2020 - Aug 2023 - **Senior Researcher**, *Microsoft Azure for Operators, Cambridge, United Kingdom.*
- Jan 2020 - Sep 2020 - **Senior Researcher**, *Microsoft Research Cambridge, Cambridge, United Kingdom.*
- March 2019 - Dec 2019 - **Postdoctoral Researcher**, *Microsoft Research Cambridge, Cambridge, United Kingdom.*
- April 2018 - February 2019 - **Research Associate**, *School of Informatics, The University of Edinburgh, Edinburgh, United Kingdom.*
Worked in the research group of Dr. Mahesh K. Marina, focusing on problems relevant to the **5G network architecture & network slicing**. **Co-supervised** two PhD students (Mohamed M. Kassem, Rajkarn Singh), one honours student (Alan Plascinkas) and one intern (Fox Foster), working closely with them on a daily basis.
- May 2016 - April 2017 - **Research Assistant**, *School of Informatics, The University of Edinburgh, Edinburgh, United Kingdom* and *Institute of Informatics and Telecommunications, NCSR "Demokritos", Athens, Greece.*
Worked in the PACER project, which was part of the second open call for experimentation of the European FP7 FLEX project (FIRE LTE testbeds for open Experimentation). Developed a **prototype open source Software-Defined Radio Access Network (RAN) platform** called FlexRAN.
- July 2013 - Dec. 2014 - **Marie-Curie Early Stage Researcher**, *Institute of Informatics and Telecommunications, NCSR "Demokritos", Athens, Greece.*
Early stage researcher for the FP7 GREENET project on green wireless networks. Worked on developing **algorithms for energy efficient vertical handovers**, focusing on the energy efficiency of the user equipment.
- July 2012 - Sep. 2012 - **Research Assistant**, *Department of Computing, Athens University of Economics and Business, Athens, Greece.*
Worked under the supervision of Prof. Michalis Vazirgiannis on developing **data collection algorithms** for the generation of a complete lexicon of Greek streets and settlements.

Education

- Oct 2013 - July 2018 - **PhD in Wireless Networks and Mobile Systems**, *School of Informatics, The University of Edinburgh, Edinburgh, United Kingdom.*
Thesis: "Towards a Programmable and Virtualized Mobile Radio Access Network Architecture"
Supervisor: Professor Mahesh K. Marina

- Oct 2012 - **MSc in Advanced Computing**, *Department of Computing, Imperial College London*,
Sep. 2013 *London, United Kingdom*, GPA: **Distinction** (86/100).
Distinguished thesis project: "Sampling in a Large Network"
Supervisor: Prof. Alexander L. Wolf
- Sept. 2007 - **BSc in Computer Science**, *Department of Informatics, Athens University of Economics*
Feb. 2012 *and Business, Athens, Greece*, GPA: **Distinction** (9.44/10).
Distinguished thesis project: "k-LWPR: Speeding up LWPR through clustering"
Supervisor: Prof. Michalis Vazirgiannis

Research Interests

My research broadly falls under the domain of networks and distributed systems and in particular in the intersection of edge computing and next-generation (5G/6G) mobile networks. My on-going research is on the following topics:

- Programmable edge architectures for intelligent observability and control
- Applications of machine learning to mobile networks
- vRAN architecture & performance
- Large-scale testbeds and experimentation

Publications

- 2024 C. Sun, U. Pawar, M. Khoja, **X. Foukas**, M. K. Marina, B. Radunovic "**SpotLight: Accurate, Explainable and Efficient Anomaly Detection for Open RAN**", To appear in *ACM MobiCom 2024*
- 2024 J. Xing, S. Yoo, **X. Foukas**, D. Kim, M. K. Reiter "**On the Criticality of Integrity Protection in 5G Fronthaul Networks**", To appear in *USENIX Security 2024*
- 2023 **X. Foukas**, B. Radunovic, M. Balkwill, Z. Lai "**Taking 5G RAN Analytics and Control to a New Level**", In *ACM MobiCom 2023*
- 2023 J. Xing, J. Gong, **X. Foukas**, A. Kalia, D. Kim, M. Kotaru "**Enabling Resilience in Virtualized RANs with Atlas**", In *ACM MobiCom 2023*
- 2021 **X. Foukas**, B. Radunovic "**Concordia: Teaching the 5G vRAN to Share Compute**", In *ACM SIGCOMM 2021*
- 2021 R. Singh, C. Hasan, **X. Foukas**, M. Fiore, M. K. Marina, Y. Wang "**Energy-Efficient Orchestration of Metro-Scale 5G Radio Access Networks**", In *IEEE INFOCOM 2021*
- 2020 G. Patounas, **X. Foukas**, A. Elmokashfi, M. K. Marina, "**Characterization and Identification of Cloudified Mobile Network Performance Bottlenecks**", In *IEEE Transactions on Network and Service Management (TNSM)*
- 2020 A. Plascinkas, **X. Foukas**, M. K. Marina, "**Towards Efficient and Adaptable Monitoring of Softwarized Mobile Networks**", In *Proc. 32nd IEEE/IFIP Network Operations and Management Symposium (NOMS 2020)*
- 2019 K. Samdanis, **X. Foukas**, E. Pateromichelakis, A. Ksentini, "**Slicing and Radio Resource Management**", In *Wiley 5G Ref: The Essential 5G Reference Online*
- 2019 **X. Foukas**, M. K. Marina and K. Kontovasilis, "**Iris: Deep Reinforcement Learning Driven Shared Spectrum Access Architecture for Indoor Neutral-Host Small Cells**", In *IEEE Journal on Selected Areas in Communications 37.8 (2019): 1820-1837*.

- 2018 **X. Foukas**, F. Sardis, F. Foster, M. K. Marina, M. A. Lema and M. Dohler, “**Experience Building a Prototype 5G Testbed**”, In *Proc. 1st International Workshop on Experimentation and Measurements in 5G (EM-5G) in conjunction with ACM CoNEXT 2018*,
- 2018 **X. Foukas**, K. Kontovasilis and M. K. Marina, “**Short-Range Cooperation of Mobile Devices for Energy-Efficient Vertical Handovers**”, In *Wireless Communications and Mobile Computing (WCMC) Journal Special Issue on Green Computing and Communications for Smart Portable Devices*,
- 2017 **X. Foukas**, M. K. Marina and K. Kontovasilis, “**Orion: RAN Slicing for a Flexible and Cost-Effective Multi-Service Mobile Network Architecture**”, In *Proc. ACM MobiCom’17*
- 2017 G. Tsoukaneri, **X. Foukas** and M. K. Marina, “**ASPIS: A Holistic and Practical Mechanism for Efficient MTC Support over Mobile Networks**”, In *Proc. IEEE Mobile and Ad Hoc Sensor Systems (MASS’17)*.
- 2017 **X. Foukas**, G. Patounas, A. Elmokashfi and M. K. Marina, “**Network Slicing in 5G: Survey and Challenges.**”, *IEEE Communications Magazine*, 55(5), pp.94-100.
- 2016 **X. Foukas**, N. Nikaiein, M. M. Kassem, M. K. Marina and K. Kontovasilis, “**FlexRAN: A Flexible and Programmable Platform for Software-Defined Radio Access Networks**”, In *Proc. ACM CoNEXT’16*.
- 2016 S. Sivaprakash, **X. Foukas**, M. K. Marina, “**VALI: An SDN-based management framework for public wireless LANs (Poster)**”, In *ACM MobiCom’16*.
- 2015 **X. Foukas**, K. Kontovasilis and M. K. Marina, “**Exploiting Short-Range Cooperation for Energy Efficient Vertical Handover Operations**”, In *Proc. 11th International Conference on Network and Service Management (CNSM’15)*.
- 2015 **X. Foukas**, M. K. Marina and K. Kontovasilis, “**Software Defined Networking Concepts**”, Appeared as a chapter in the book on *Software Defined Mobile Networks (SDMN): Beyond LTE Network Architecture*.
- 2015 **X. Foukas**, A. Carzaniga and A. L. Wolf, “**Measuring the Mixing Time of a network**”, In *Proc. 2015 IEEE Conference on Computer Communications (INFOCOM)*.
- 2014 **X. Foukas**, D. Loukatos, K. Kontovasilis and H. Marques, “**Energy Requirements of Secure Vertical Handover Operations in the 802.21a Framework**”, In *Proc. IEEE CAMAD 2014*.

Honors and Awards

- 2023 **Best demonstration runner-up award** for “Programmable RAN Platform for Flexible Real-Time Control and Telemetry” in *ACM MobiCom 2023*.
- 2017 **Best demonstration award** for “Orion: A RAN Slicing System” in *ACM MobiCom 2017*.
- 2017 **Finalist at Lime Micro Hackathon** organized by the *BT Infinity Lab* for “Orion: RAN Slicing System over LimeSDR” (*8 finalists out of 60 registrants*). Selection criterion based on the significance of impact and disruption of the traditional mobile network approach.
- 2017 Received the **Brendan Murphy Prize** as an outstanding UK PhD researcher in the networks and systems areas in *MSN 2017 UK Academic Meeting on Systems and Networks*.
- 2015 Received **student travel grant** for presenting the paper titled “*Exploiting Short-Range Cooperation for Energy Efficient Vertical Handover Operations*” in *CNSM 2015*.
- 2012 Received **departmental scholarship** on *academic distinction* by the *Department of Computing at Imperial College London*.

- 2012 Received **graduation award** on *academic distinction* by the *Department of Informatics* at the *Athens University of Economics and Business*. Ranked **1st in a class of about 250 students** and **3rd in the whole department since its founding in 1983**.
- 2007 Received **award on high performance** in national exams by the *Department of Informatics* at the *Athens University of Economics and Business* (ranked 4th).

Professional Service

- TPC Member ACM MobiCom ('24, '23, '22, '20), ACM MobiSys '24, DistributedML ('22, '21, '20), IEEE SECON '19, ACM WiNTECH '18, IEEE EuCNC ('17-'19), VTC '19, GIS '18
- Reviewer *Invited reviewer* for high-impact journals including IEEE/ACM Transactions on Networking, IEEE JSAC, IEEE Transactions on Wireless Communications, IEEE Transactions on Mobile Communications, IEEE Transactions on Communications.

Open Source Contributions

- FlexRAN Main developer of the open source FlexRAN project for Software-Defined Radio Access Networks (<http://networks.inf.ed.ac.uk/flexran>).
- OAI Contributor to the OpenAirInterface (OAI) open source project, writing code for the MAC and the RRC layer of the 4G/5G Radio Access Network.

Languages

- English Fluent
- Greek Native Speaker
- German Intermediate
- Spanish Basic