Xenofon Foukas

Curriculum Vitae

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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 - Sep. 2013 **MSc in Advanced Computing**, *Department of Computing, Imperial College London, London, United Kingdom*, GPA: **Distinction** (86/100).
Distinguished thesis project: "Sampling in a Large Network"
Supervisor: Prof. Alexander L. Wolf

Sept. 2007 - Feb. 2012 **BSc in Computer Science**, *Department of Informatics, Athens University of Economics and Business, Athens, Greece*, GPA: **Distinction** (9.44/10).
Distinguished thesis project: "k-LWPR: Speeding up LWPR through clustering"
Supervisor: Prof. Michalis Vazirgiannis

Professional Experience

Oct 2020 - present **Senior Researcher**, *Microsoft Azure for Operators, Cambridge, United Kingdom*.
Working on designing and developing **efficient, scalable and intelligent virtual RAN solutions.**

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 Plascinskas) 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.

Research Interests

My research broadly falls under the domain of *networks and distributed systems* and in particular in the intersection of *wireless and mobile networks and cloud computing*. My recent and on-going research is on the following topics, focusing mostly on aspects relevant to next-generation (5G) mobile networks:

- 5G and beyond virtual RAN (vRAN) architecture & performance
- Intelligent vRAN control
- Applications of machine learning to mobile networks
- Edge Computing
- Spectrum sharing & network slicing
- Testbeds and large scale experimentation
- Network management & orchestration

Publications

2023 **X. Foukas**, B. Radunovic, M. Balkwill, Z. Lai "**Taking 5G RAN Analytics and Control to a New Level**", 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. Plascinskas, **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. Nikaein, 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 Sofware 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*.

Talks (Invited/Conference)

Dec. 2018 **1st International Workshop on Experimentation and Measurements in 5G (EM-5G) in conjunction with ACM CoNEXT 2018**, *Heraklion, Greece*, *"Experience Building a Prototype 5G Testbed"*.

April 2018 **NEC Laboratories Europe**, *Heidelberg, Germany*, *"Towards a Programmable and Virtualized Mobile Radio Access Network Architecture"*, **Invited Talk**.

Nov. 2017 **King's College London**, *London, United Kingdom*, *"Virtualization and Programmability of Radio Access Networks in 5G"*, **Invited Talk**.

Oct. 2017 **ACM MobiCom**, *Snowbird, Utah, USA*, *"Orion: RAN Slicing for a Flexible and Cost-Effective Multi-Service Mobile Network Architecture"*.

June 2017 **Multi-Service Networks workshop**, *Abingdon, United Kingdom*, *"Towards Programmable and Virtualized Radio Access Networks"*.

Dec. 2016 **ACM CoNEXT**, *Irvine, California, USA*, *"FlexRAN: A Flexible and Programmable Platform for Software-Defined Radio Access Networks"*.

Dec. 2016 **NCSR "Demokritos"**, *Athens, Greece*, *"Introducing Programmability in Radio Access Networks"*, **Invited Talk**.

Nov. 2015 **CNSM 2015**, *Barcelona, Spain*, *"Exploiting Short-range Cooperation for Energy Efficient Vertical Handover Operations"*.

April 2015 **IEEE INFOCOM**, *Kowloon, Hong Kong*, *"Measuring the Mixing Time of a Network"*.

Dec 2014 **IEEE CAMAD**, *Athens, Greece*, *"Energy Requirements of Secure Vertical Handover Operations in the 802.21a Framework"*.

Honors and Awards

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 ('23, '22, '20), DistributedML ('22, '21, '20), IEEE SECON '19, ACM WiNTECH '18, IEEE EuCNC ('17-'19), VTC '19, GIIS '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).

Orion Main developer of the open source Orion project for Radio Access Network slicing.

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